CHAPTER 2

# Description of the Behavioral Treatment Strategy: Exposure

You gain strength, courage and confidence by every experience in which you really stop to look fear in the face. You are able to say to yourself, "I have lived through this horror. I can take the next thing that comes along." You must do the thing you think you cannot do.

—Eleanor Roosevelt

## EXPOSURE: A DEFINITION AND EXPLICATION

In the 1960s, psychologists were beginning to more formally use a strategy called "exposure" (although its first uses can be traced back to the 1920s [Barlow & Durand, 1999]), a method that involved asking patients to face real-life situations that they perceived as frightening. As such, patients were asked to deliberately and repeatedly come into contact with circumstances that were anxiety-provoking (e.g., using public transportation and restrooms, spending time in crowded locations, driving alone, touching certain objects or animals). This, of course, was asking people to look fear in the face, as Eleanor Roosevelt put it. In much the same way, with a variety of refinements and some modifications, this is what is still involved in exposure treatments today; that is, patients are (basically) asked to deliberately confront anxiety-provoking thoughts, situations, and circumstances, which are objectively safe of course, until their arousal levels are reduced by at least half. Patients are also asked to perform such tasks again and again, until the repetition begins to lessen, or decondition, the anxiety reaction and fear response in the presence of

the provocative stimulus. In short, patients are asked to face the stimulus until it seizes to be provocative.

On the surface of the description of exposure, it might sound like a cruel way to overcome anxiety and fear. Subjectively, it might not sound "good;" indeed, it might actually sound frightening and uncomfortable. In fact, it has been abandoned from time to time throughout history since its inception, and typically then in favor of some other behavioral technique that was perceived as less overwhelming, such as systematic desensitization (Barlow, Moscovitch, & Micco, 2004). When exposure has not been used, it has often been so because *practitioners* (not patients) have feared that patients will not be able to tolerate the exposure, that it would be too overwhelming or intolerable. This is rather ironic because patients are typically already overwhelmed by anxiety and fears when they seek treatment, and the overwhelming (pun intended) evidence suggests that if their anxiety and fears are not adequately resolved then the patients will remain overwhelmed for long periods, sometimes lifetimes. What could be crueler than a lifetime of agony from anxiety and fear? Is some short-term, yet tolerable, discomfort really *that* cruel? If so, then in comparison to what?

As it turns out for many anxiety problems, there are several cognitive-behavioral methods that are helpful, but few strategies appear to be as potent in producing *direct* and highly effective relief in the specific symptoms of anxiety and fear. This bottom line seems to be driven by what happens to these kinds of autonomic phenomenon when people do *not* face that which makes them uncomfortable through continued behaviors aimed at not looking fear in the face.

## ESCAPE AND AVOIDANCE: MAINTAINING ANXIETY

Mowrer's two-factor theory (1947) provides the strongest argument for why anxiety and fear do not naturally or easily extinguish when people learn to escape from, or successfully avoid, feared stimuli. This "avoidance learning" model proposed, rather convincingly, that the failure of fear to extinguish is directly related to not being able to challenge and test fears in the *absence* of the feared stimulus, and hence it remains preserved and protected from extinction. Discovering what will actually happen in the presence of a stimulus can truly only occur in its presence, because everything else would be speculation of varying degree.

One predominant reason people have a difficult time allowing real-life outcomes to inform them about whether their fears are warranted or whether they are overestimates of the true state of affairs (or are completely correct, for that matter) is that when people consider doing

what they are afraid of they commonly do not anticipate the average, or most likely, outcome. Instead, anxiety and fear networks prepare the person for the worst possible scenario; this "disaster preparation" leaves people feeling and thinking that truly horrible things will happen if they go ahead and do what they are afraid of.

Indeed, if the imagined, catastrophic outcome was true, then it truly would be "bad," so why tempt fate? What many anxiety-disordered individuals do not recognize is that *all* experiences in the world operate on a normal distribution and are under the influence of normal probability statistics. Instead of viewing world events through such a scientific frame, however, they instead subjectively come to expect, through grossly inflated probability estimates derived from how likely events *feel*, that if they do what they are afraid of (e.g., drive a car alone), then their worst fear will be highly likely, if not guaranteed, to happen (e.g., car crash). This belief is complicated and erroneously supported by two basic pieces of information, namely that when they do not drive they do not crash (i.e., avoidance pays off *every* time, whereas driving represents something akin to Russian roulette, where death sometimes happen)—and various media sources are filled with car crashes every day, lending credence to the belief that car crashes happen with enormous frequency.

Consider for a moment the local, national, or international news. How much of the news reporting is about "Average Joe" (maybe not the best choice of name anymore) and his average day. His average day, of course, looks extremely boring; he wakes up in the morning, takes a shower, has breakfast and reads his newspaper, commutes to work, performs his job functions, has lunch while chitchatting with colleagues, finishes the day's work chores, commutes back home, has dinner, watches television, and eventually goes to bed, only to repeat the whole boring scenario again tomorrow. What would the news be like if that is what people saw? Boring! People's lives are just that: mundane, repetitive, uneventful, and truly too boring for news to be documenting the lives of Average Joe or Boring Bill. No, instead what news outlets report on is Unlucky Luke who (against the best odds, actually) crashed on the way to work. Not only did he crash, but he broke his back and is now paralyzed from the chest down and is in a coma, and at home his seven children are going hungry after his wife ran off with another man, and so on. What also is not reported is Slightly Statistically Unusual Chris, Martha, Beth, and assorted others who actually had "average accidents" today, or fender benders. These kinds of accidents are not interesting and not *newsworthy* as nothing different, out of the ordinary, or statistically unusual actually happened to them. No life flights. No emergency 18-hour surgeries where the mangled person dies several times, but is successfully brought back to life. No sensationalism! No, these average, run-of-the-mill accident

"victims" will just go on about their otherwise completely average lives, bar the slight dent in their fenders. So, consider for a moment just what kind of information people, especially anxiety-disordered people, are being bombarded with every day. Consider what that amount of death, mayhem, and otherwise horrific information might do to an anxiety-disordered individual's probability estimation capacities. Never mind that what is reported represents an extremely skewed statistical distribution of real-life, everyday, and common outcomes. The problem is that anxiety-disordered individuals begin to see the level of death and mayhem as actually being average and not as being a skewed representation. They begin to expect that terrible outcomes are much more normal and commonplace than a normal distribution would support, if normative information was used to calculate risk ratios. If everyone thought they were going to be killed in a car crash on the way to work today, and actually *believed* it, how many cars would be seen on the roadways today? Almost none probably, and perhaps those who would seek out driving that day are those people who actively are trying to commit suicide.

Avoidance learning operates very much on the same principle that makes Unlucky Luke and Average Joe influence what a person does when they consider whether they should drive to work today. More explicitly, what Mowrer proposed was that fear is initially learned and acquired through classical (i.e., autonomic, startle, or reflexive) conditioning, and is maintained through operant conditioning (i.e., what happens to a person before, during, and after the presentation of a stimulus). The person who is afraid of driving his or her car might have initially learned to be afraid of driving because he or she was startled by actually being in a car accident, being nearly hit, or seeing an accident (an unconditioned stimulus). The startle, or surprise and fear experienced (an unconditioned response) during the acquisition event, classically conditioned the response (e.g., release of adrenalin and endorphins, increased heart rate). Because the reflexive response occurred in the presence of a car, the car becomes the operant (i.e., control variable) that directs future similar automatic responses (conditioned response) through operant conditioning. Danger and threat have become attached to cars and perhaps anything else directly or indirectly associated with cars. This will likely lead to a desire to reduce contact with cars and associated stimuli because of their threat-signaling capacity, because feeling threatened feels bad, and because people are driven to avoid what feels bad; this produces avoidance symptoms (e.g., not driving cars, or having someone else drive). These avoidance symptoms are engaged to avoid the conditioned response of anxiety and fear, which was associated with the original trauma event.

This represents a basic, primitive, and almost primordial way of learning emotional material, such as fear-based information. Such basic

Proximity of Danger and Associated Behavioral Action Tendencies

Near Moderately Close Far

0 ---------- 1 ---------- 2 ---------- 3 ---------- 4 ---------- 5 ---------- 6 ---------- 7 ---------- 8

Faint Fight Flee Freeze

Defensive Aggression Explosive Escape

Tonic Immobility Stop Movements

Dissociation Vigilance

Behavioral Inhibition Behavioral Activation Behavioral Inhibition

Low Action ---------- 2 ---------- 3 ----High Action---- 5 ---------- 6 ---------- Low Action

FIGURE 2.1 Location of threat and related behavioral responses.

learning is conducted at a primitive, nonconscious substrate. This means the information learned is more directly stored in emotional defense and safety networks, which are more closely related to survival behaviors than in consciously aware centers of reasoning. As such, the information is used and accessed when a person feels threatened in an automatic, reflexive manner, and this type of information and response is not necessarily available for conscious cognitive evaluation before deployment.

This reflexive response safeguards against people doing too much thinking in the presence of threat, and instead produces more action. Recall that anxiety is a basic emotional response that in foundation signals, or primes, the person to get ready to act in the face of either actual or perceived threat (e.g., fight or flee).

Depending on the proximity of threat, there are four common response sets of actions that are geared toward helping the person survive (Figure 2.1). For ease of teaching patients about these types of responses, it can be helpful to refer to these as the 4Fs (which will be described in the following section). Many patients have reported asking themselves which kind of "F" they are engaging in to give them a better picture of what is happening to them in an everyday experience of anxiety or fear.

The type of survival action employed depends very much on the circumstance an organism finds itself in. For instance, when a threat is far away, the best course of action appears to be avoiding detection. If the threat is closer, but can be outrun, and an escape route can be seen, running away (fleeing) is the preferred mode. If the threat cannot be outrun, then fighting is chosen. Last, if the organism has been spotted, tried to run but was caught, and could not outfight its attacker, then playing dead is the

best available defense. This heralds back to early times in human history when people were not yet entirely at the top of the food chain, but when people were more often dinner for some predator higher in the chain. These kinds of responses can often be observed on nature-oriented television shows, where it can be observed, for example, that antelopes on the African savannah do not move as a lioness saunters by in the distance, or that antelopes will try to spear their pursuer if caught.

In an effort to ensure that patients truly grasp the normal, adaptive nature of various anxiety responses, on an evolutionary level again, and specifically (scientifically) appreciate why the responses are happening, it may be helpful to use stories and metaphors to illustrate the primordial value of such responses. Two common stories I tell are about lions and antelopes on the African savannah and about smoke jumpers (forest firefighters who parachute into forest wildfire areas). These stories allow patients to listen to the fundamental therapeutic information, but allow them to superimpose their own, private information onto the stories in a naturally occurring fashion. I have loosely come to refer to these naturally occurring moments as "ah-ha moments," when, during some pivotal part in the story or metaphor, the therapeutic content "clicks" with some personally relevantly fitting information, which is then instantaneously imported into the generic story or metaphor. In such moments, the patients then seemingly independently derive, or figure out, therapeutically important information. Again, Otto (2000) reported that this way of imparting therapeutic information allows patients to encode the information in easily accessible formats, increasing the likelihood of using the information in the moments of their lives where it might be apropos. The two stories follow.

### African Savannah Vignette/Story/Metaphor

You were probably wondering where I was going with the cow illustration before, correct? [Here I alert the patient to the idea that another metaphor or story is coming, cueing them to put on a somewhat different thinking cap.] But it was a good way to learn about emotional reasoning. Well, I have another one for you that is very similar. Have you ever been to the African savannah? [Most patients respond in the negative.] No? Well, let me tell you a few things about the African savannah and about lions and antelopes that live there. Let's just say it's a tough place to live in; first of all, it's usually about 1,000 degrees during the day, but if you're a lion you nonetheless have to eat, and if you're an antelope you have to try your hardest not to be eaten. Like I said, it's a tough place. Now, you might not know this, but the savannah is perfectly flat. It's like a pancake, really. You can see for miles. This is a good thing if you are an antelope, actually, because you can spot a lion coming from

a mile away. Let me also tell you that antelopes can easily outrun lions, so if you're an antelope you're in pretty good shape, both literally and figuratively. This presents sort of a problem for lions. After all, if you're a lion you still have to eat, but if the antelope can see you from miles away and they can outrun you, how the heck do you actually get to eat? After all, you have to *catch* your supper there! [Here I pause, giving the patient time to consider how one would actually go about catching something that can see well and runs fast. Most patients usually come up with some variation about hiding in the grass, but I quickly point out that there is not enough grass to hide that thoroughly to be able to approach undetected. Most patients then typically shrug their shoulders, and become inquisitive about how such a feat is actually possible.]

Well, it turns out that lions are smart animals. They're very, very smart. They are communal animals, meaning they live together in families. These families are in part made up of the young, which are too small and inexperienced to actually successfully take down an antelope even if they were sitting right on top of it. They are also in part made up of the old, or lame, or injured animals that cannot hunt successfully either because of old age, injuries, or other maladies. Then, of course, there are the middle-age, agile hunters who single-handedly could take down an antelope, if they could only catch up with it. All of these various family members have to eat, whether they are young and immature, middle-age and agile, or old and disabled. They all know it, too. That's why they're smart! Hunger is also a great motivator, because it makes them think hard and fast about how to catch the antelope. At some point, they recognized some common variables that would prove to be very useful to the purpose of catching antelope. They recognized that antelope would always run away from lions, which certainly makes sense if you're an antelope, right? [Here I am making sure the patient is following the gist of the story and gets the developing picture.] They discovered that the antelopes would even run away from a lion cub or an old, injured lion so long as those lions sounded big, scary, and dangerous. The antelope were not particularly discriminating what they ran away from, which sort of makes sense if you are the antelope; after all, you escaped from something you *thought* might kill and eat you. If you're an antelope, your job, basically, is to avoid and run away from lions. Doing so is good for your health. So, again imagine this flat pancake of a savannah, and then watch as the lions split themselves into two separate teams. [Here I will slow the rate of speech, and lower the tone of my voice to accentuate the "trick" that the patient is now expecting to come.] The two teams are split into the one that contains only the agile hunters, and one that contains only the young, old, and injured. The hunters go to that far end of a field, which has antelopes in it, and lay down completely flat. They are also very quiet and don't move. The other team goes to the other far end of the same field. In this fashion, the antelopes are now in the middle, still perhaps munching away blissfully

at the savannah grasses. Soon, however, they begin to notice the second team made up of the young, old, and injured because they make no attempt at hiding themselves. In fact, they begin to make movements toward the antelopes, and make very hungry, frightening roars as they approach. [Pause for effect.] Let me ask you this: which way will the antelope run? [Pause for effect. Sometimes patients will spontaneously blurt out, "toward the waiting hunters!"] They will run away from what is frightening them, but when they do that they run right into the claws and mouths of the waiting, agile hunters. They really don't stand a chance, and the waiting hunters will take down enough antelopes for the whole family of lions to eat. In fact, the antelope would be far better off if they ran toward what frightened them, not away from it because then they run straight into worse trouble than if they would run toward being scared. In this respect, life of an antelope on the savannah is very similar to the anxiety you experience. That is, you tend to run away from—or avoid—what scares you, and you, too, would be much better off if you instead went toward what frightens you. [Here I will usually disengage the story for a bit to discuss examples of escape and avoidance behaviors the patient uses.]

Now, let's talk about animals on the savannah a little further still, OK? [Patients usually prefer these exercises to more technical presentations, although they are sometimes also needed.] It turns out there is a preferred sequence of four common survival behaviors. I'm going to refer to these four sets of responses as the 4Fs [begin to write on board], and you'll quickly see why. Imagine you are that antelope on the savannah. Your job is to not be eaten, right? That's right, you're going to *do* everything possible to increase your odds of sheer survival. It turns out that fuel and energy is critical to surviving on the savannah, too, so you don't want to expend anything unless you really have to. This way, when you really needed the energy, like when you might have to outrun a lion, you would have it stored up for that special occasion when you get to the "hundred-meter-dash-or-die." That's why *what* you do to survive follows a very predictable, sequential way of responding, which typically is related to how close a threat is to you in proximity. So, let's imagine you are that antelope on the savannah again, and you're laying down resting, perhaps munching some grass, and you happen to spot a lion walking by quite some distance away. After all, you can see really well, so you easily spot it as it goes by. What do you think would be your best strategy for survival in this encounter? [Here I pause for the patient to think and respond, and then write on the board: "Freeze."] Well, your best response would be to not move. Why would that be your best response? First, it conserves fuel for a later time if you had to run like the wind. So, if the lion did not see you, why should you run? Seems like a waste of energy, doesn't it? [Patients typically agree.] Second, do you know how and what lions, and most predators for that matter, see? [Pause for patient to think.] Well, they see in black and white, in monochrome vision. Not in color vision. Why is this important, you

might be wondering? It's important because monochromatic vision is best for detecting subtle movements and outlines. Color vision is great for seeing crisp detail and the pretty colors, but if your objective is to see movements, then black-and-white vision is much more of an advantage. How do lions spot you, then? Is it because of your pretty colors, and so on? No, they see you when you move. Predators of all sorts are oriented toward movement. Therefore, your best bet, if the predator, or lion in this case, is further away, is not to move. They might not see you. If they don't see you, they will not try to catch you and eat you. This is also, by the way, the reason the stripes on zebras help them. When they run away from lions they do it en masse, or in a group; when they do that, it becomes very difficult for the monochromatically seeing lion to tell where one zebra begins and another ends, making it harder to bring one down.

So, now let's pretend the same scenario, with the lion walking by some distance away, is true, but that the lion spotted you. Then what is your best, preferred response? [Pause, and wait for patient to think and possibly provide an answer, then write: "Flee."] Your next best bet would be to run, and run like the wind. Run like you never have before. If you successfully run away, you will not be eaten. You might be tired, but you're alive. That's primarily because you didn't allow the lion to touch you, so anything you can do that will prevent it from touching you or stop it from touching you if it has started to will be important for survival. You can rest later, but for now you survived, and that's the important part. Well, next let's pretend that the lion saw you and actually caught up with you. You couldn't, for some reason, outrun it. What do you do now? [Pause, and write: "Fight."] That's right, you would fight like hell. Why would you, as a little fragile antelope, fight a big, nasty lion? Certainly not because you have some sort of Napoleon complex, but because lions have to be relatively healthy to survive on the savannah. Yes, there is an increased risk of being hurt because you might actually be touched by the lion. Still fighting, at this point, is preferable. Remember that life on the savannah is rough, it's hard! If you're a lion and you're missing an eye, or you have cracked ribs, or you have a punctured lung, you might just be out of luck. Last I checked, there isn't a lion emergency room on the savannah. Lions don't like to be injured because it might mean death for them. So, when a prey fights too furiously, even if it's smaller, the lion might just leave it alone, in favor of catching some easier, less combative prey later. Remember that lions are smart. Besides knowing they have to eat, they also know it's going to be much, much more difficult to do so with significant injuries.

OK, we are progressing along the normal sequence of preferred choices of actions, if our objective is to survive. The last response might be a bit more difficult to understand, but let me explain to you why, in a primitive way, the response of dissociating, "checking out," or fainting will help to protect you when all of the chips are down. [Write: "Faint."] Have you ever had the experience of being "scared stiff," where you just

got so frightened that you literally couldn't move, felt frozen, or you actually fainted? [Some patients can relate to this experience, especially among rape trauma victims, combat veterans, and specific phobia patients who exhibit the vasovagal syncope fainting response.] Remember, I told you predators are drawn, or aroused, by movement? Well, have you ever seen a typical barn cat play with a mouse or a bird it has caught, and perhaps brought it to your house as a token of appreciation? Well, have you noticed why or when the cat finally stops "playing" with the mouse or stops swatting it around? When the prey stops moving, right? When it plays dead, or is dead, the cat stops. This is true for the big cats on the savannah, too. They stop clawing, scratching, and biting when the prey stops moving. So, if you're that antelope, for goodness sake, if you have been unable to fight off the lion, after being spotted and caught, then play dead. If you play dead you might still stand a chance. The only problem remaining, of course, is how one manages to be calm enough to look dead when there's a lion sitting on you, when you actually aren't dead! This is where your own body takes over to try to make sure you actually look dead, by preventing your body from fidgeting around and doing anything else that signals remaining life and struggle. This response only happens as a last-chance resort, again to protect you, but only after the other, escape-oriented actions have failed to work. When this paralysis response set in, you become less able to move, you become unable to make sounds or speak, you become numb to pain, and you will become disoriented or somewhat unaware of your surroundings. After all, if this terrible thing is happening to you, why be "present" for that? Interestingly, to further illustrate how sequential these behavioral responses are, when an animal or person comes out of one of these paralyzed, frozen states, they return right back to the immediately preceding behavioral response, which is fighting. So, as you see, there are very adaptive reasons for why your body should be reacting the way it does, only for you personally, there are no lions after you. Your body, nonetheless, is acting as if there were. We need to change that.

### Smoke Jumper Vignette/Story/Metaphor

Do you know what a "smoke jumper" is? No, well, as completely insane as this might sound, a smoke jumper is a firefighter who parachutes into the midst of raging forest wildfires. So, not only do they jump out of a perfectly sound plane, but they jump into fire! Sounds like a brilliant career, right? [I find that humor commonly puts a tolerable twist to otherwise challenging topics, and it allows me to lighten up the conversation; however, the appropriateness of humor should be based on individual patient suitability.] Well, smoke jumpers are an interesting breed, in that not only are they willing to work very hard at fighting fires in very remote areas, but, despite the way it might sound, they are very vested in surviving. They know that what they are doing is

potentially quite dangerous. Fire can kill people quite readily, so it's not something to take too lightly. Knowing this, smoke jumpers carry some tools that are designed to help them survive. They carry shovels and picks to dig fire lines with and a whole bunch of other stuff to help them stop the fire. The main danger, assuming parachuting is safe enough to be survived, is that to stop the fire, the smoke jumper has to be on the side of the fire where there is fuel remaining. It does no good to have the smoke jumper on the side of the fire where it has already burned off the fuel. However, standing on the side with fuel, conceptually if not in reality, makes the smoke jumper fuel, too. The danger is that if the smoke jumper gets caught by the fire, he or she will burn up. That would be bad. So, in short, there is a safe side of the fire, which is the one where there is no more fuel, where the air is not superheated, and where there are not poisonous gases, and a dangerous side, which is usually in firefighting referred to as the "kill zone" for good reason. Follow me so far? [Pausing to be sure the patient gets the idea that being on the dangerous side is inherently bad, but a necessary evil for forest fire fighting.] Sometimes something very scary happens to smoke jumpers. Something terrible. [Here I slow my rate and lower my tone to draw attention and charge the atmosphere.] Sometimes, they become encircled by fire, meaning there is no way out. So, in such a circumstance, and because of the nature of fire that will want to burn any remaining fuel, they are in grave danger of becoming more fuel for the fire. They cannot actually outrun the fire, eventually, but instead they have to find some way to get to the other side of the fire, to the side where there is no more fuel and superheated air and toxic gases. However, this would necessitate going through a wall of fire. How does someone go through a wall of fire? How is that possible? [Pause, to wait for patient to think about it and see the clearly dangerous nature of the dilemma.] Well, they carry with them a piece of equipment that smoke jumpers only half jokingly refer to as a "slow bake." Do you know what that is? No, well, what it is, essentially, is a fancy space blanket. Not just the kind you can buy in the local camping goods store, but the $2,000–$3,000 kind you special order from a firefighter supply store. It is basically a one-person shelter that you can draw over yourself, so that you are underneath it against the ground. So what the smoke jumpers who wish to have a chance to get through a wall of fire have to do is to clear away fuels, such as wood and grass from a 10 foot × 4 foot rectangle, then lay down with the shelter over them and allow the fire to pass over them. This fire shelter has saved many lives because it is made to withstand extremely high temperatures, so that the fire can pass over the smoke jumper and allow him or her to emerge on the side of safety, where there is no more fuel. Nonetheless, smoke jumpers tell me it gets hot in there, almost hot enough to slowly bake something, or someone; hence, the name "slow bake." In this case, the smoke jumper has to go against eons of learning that says to run away from fire, and instead go toward it and even through it. The smoke jumper has to do what

> might seem unnatural to stand a chance of living. Anxiety operates very much like this, where everything is telling you to run away from the fire, to escape its searing temperatures and poisonous, superheated gases. Only problem is, with anxiety disorders, it's like you are encircled, like a smoke jumper in trouble, and you can run and avoid for a while, but sooner or later the only way you will be OK is to get through the fire, or in your case, face what makes you afraid. Just as smoke jumpers are trained on how to use fire shelters, we need to teach you how to use a fire shelter of sorts to get over, or through, your fears. Our fire shelter is exposure.

Although this system of classically and operantly conditioning encoding emotionally charged information is advantageous in some important, primitive survival ways, it also creates some unique problems. Primarily, the greatest problem still facing practitioners working with anxiety-disordered patients is how to properly access this type of information, as important autonomic response sets and behavioral activation codes are stored outside more conscious domains. Although conscious domains of operations may be available to both practitioner and patient to collaboratively work on and modify in ways that will better suit the patient in a modern world, autonomic reactivity and fear responses may not be as readily available for modification *unless they are directly accessed.* Exposure methods allow access to domains that otherwise cannot be readily entered and because such methods have a more direct capacity to extinguish reactivity and autonomic arousal, they are central to the adequate treatment of anxiety disorders.

Mowrer's model essentially describes the concept of negative reinforcement. Negative reinforcement refers to the strengthening of behavioral response sets through the removal of an aversive stimulus (e.g., something anxiety or fear producing). This kind of reinforcement is a more powerful agent of reinforcement than either positive reinforcement or punishment. Positive reinforcement often runs the risk of satiation effects, meaning that the reinforcer (e.g., food, money) is only reinforcing when the subject being reinforced views or experiences the reinforcer as desirable; that is, for food to be a reinforcer, a person would have to be hungry, or for money to be a reinforcer, the person would have to want something the money could buy. If the person was not hungry or had enough money already, those reinforcers would be irrelevant, and would consequently *not* be reinforcing. Therefore, a common dilemma is how a practitioner actually knows whether the patient truly is reinforced by a positive reinforcer.

Punishment, as a reinforcement strategy, is also fraught with challenges; for example, in the face of punishment, the punishment must be inescapable or the subject being punished will try to escape it. How often do people

actually have that much control over another person? It is more likely that the subject being punished will not learn to stop the behavior being punished, but rather to only exhibit the behavior when the punishing agent is not around, or to simply avoid the punishing agent all together. Reinforcement is meant to increase or decrease behavior, but as such both positive reinforcement and punishment do only a minimally adequate job of the task. Punishment also has some inherent, potential moral issues. Is inflicting pain (a "positive" punishment paradigm, such as spanking) or removing some privilege (a negative punishment paradigm, such as a meal) all right? Many people do not think so. In fact, some countries (e.g., Sweden) have outlawed corporal punishment, so it is in some places illegal to spank someone (presumably an unruly child). Many countries do not allow the death penalty. Punishment is highly controversial in many ways, both on moral and pragmatic grounds. Beyond moral objections, for example, it is clear that physical violence teaches primarily using physical violence. Fundamentally, this is a problem for many people on many levels.

So, then, what is negative reinforcement, and why does it work so much better than positive reinforcement and punishment? By definition, negative reinforcement means going from something bad to something better. In essence, negative reinforcement means to take away something bad or unpleasant that by default (naturally) leaves the subject *relieved*. For instance, imagine being delirious with a fever and body aches because of a strong flu. That feels bad, and the person is, if the flu is bad enough, pretty much incapacitated. He or she is in a "bad way." Then, whether through medicine or time, the person begins to feel better; that is, the feeling bad is removed and is replaced by feeling better. That change for the better is inherently, naturally incredibly reinforcing, and makes it highly likely that the person will do again whatever he or she did to feel better last time should he or she ever feel bad again (i.e., the response that created feeling better is reinforced, increasing the likelihood it will be used again in the same or a similar circumstance). It is not even necessary to be all better, so long as the person feels just slightly better than before, akin to feeling a bit better after taking the aspirin or cough medicine (although not being all better yet). Feeling good is always preferable to feeling bad, which in essence is the backbone of the hedonistic principle on which survival is based. In a fundamental way, there are some experiences people are programmed to naturally fear because encountering such stimuli could threaten survival. For example, people naturally know if they fall from something high they might be seriously hurt, or even killed, so people tend to approach (especially novel) heights with caution. This caution is a natural response to something that signals possible danger. The same is true for situations such as deep water (people could drown), sharp objects

(people could be cut or impaled), and a whole host of other basic threats to well-being and health. Being sick and feeling sick (nauseous) are other common experiences that come programmed for people at a deep, subconscious level as natural aversions. This is because in a primitive way, it could signal impending death or poisoning. Such primitive threats are responded to in autonomic, reflexive ways (e.g., vomiting when nauseous is meant to protect against poison) that are not necessarily available to or under the control of conscious thought processes.

The concept of *establishing operation* (Michael, 1982) refers to the idea that the practitioner must be aware that there are emotional states that are naturally reinforcing, such as what occurs within a negative reinforcement paradigm. So, anxiety for example, as an emotional state, is an establishing operation because it increases the reinforcing value of removing certain (aversive) stimuli and because it increases the frequency of those behavioral response sets that remove fearful stimuli (Sturmey, 1996). Establishing operation is intimately tied to the nature of negative reinforcement, in that it *establishes* what the individual will do to feel better (e.g., will avoid and escape to feel less anxious).

## ROLE OF EXPOSURE IN REDUCING ANXIETY RESPONSES

So, how does exposure really reduce the autonomic anxiety response? This is a common question from both practitioners and patients. It is an important question, because the answer addresses the central mechanism of change of exposure. It is about the power to dramatically change just how easily someone becomes highly aroused, especially in circumstances in which the individual inaccurately responds with the kind of arousal that should occur in the presence of true and immediate threat to life and limb.

Exposure actually follows naturally from etiological models of anxiety and fear, which are built on learning theory. Because certain stimuli, whether they be thought- or situation-based, have taken on the capacity to elicit an (inappropriate) anxiety response, exposure deconditions this unwarranted response. In other words, strong reactions of anxiety and fear are reduced through repeatedly experiencing the aversive stimulus in the absence of actual, true threat or harm. After repeatedly not being harmed by the feared stimulus (e.g., not crashing the car when driving), it eventually ceases to produce the activation of the motivational system geared at helping a person survive. It stops responding with anxiety because the feared outcome (i.e., predation) does not occur. Fortunately, the human body is a system of conservation because it is a system for survival; when threat and danger are not imminent, then the body will conserve fuels meant to facilitate survival. Therefore, when an individual

remains in the presence of what is supposed to be threatening (e.g., driving), and the outcome (e.g., car crash) does not happen, before too long the body will turn off the anxiety reaction, saving it for later.

So, how does exposure work? It works because it asks patients to face what they fear to be true without leaving (i.e., escaping or avoiding), so that, repeatedly, the survival system, which had been inaccurately responding to an imagined or benign threat, can stop or reduce its response. Exposure works by teaching the survival motivational system that it was reacting when it did not need to, responding, in essence, at the wrong time. The reason this deconditioning does not occur easily by itself for many anxiety-disordered patients is the typical fact they are not remaining with noxious and aversive stimuli for sufficient amounts of time for the survival system to recognize it responded in error. In fact, through escape and avoidance, the system learns, or is conditioned to believe, that it was successful in thwarting predation; hence, the next time the system (person) encounters the stimulus, it will enact the same sets of responses because it was *successful* in the past in preventing negative outcomes. Exposure forces the system to recognize its error, through giving it the opportunity to encounter better evidence for what is truly dangerous and not. Exposure forces the system to act on the basis of evidence, much like the scientific method treats beliefs and assumptions as hypotheses deserving testing; thus, exposure is akin to the scientific method step of testing hypotheses to derive information or data about the state of affairs. Avoidance and escape treats assumptions and beliefs as absolutes, and does not allow such to be tested or examined for their credibility. Exposure allows corrective information about the nature of threat and danger, and this new discovered information, in short, allows the survival system to respond more accurately, or at times when it is needed.

Why exposure works is a bit more complicated, however. Looking fear in the face, as Eleanor Roosevelt put it, is not enough. Something else has to happen for the exercise to be useful. In discovering evidence and "truth" (a scientific oxymoron) the autonomic, sympathetic nervous system has to be turned off by the parasympathetic nervous system; in other words, the individual has to experience *habituation*, or a decrease of arousal in the presence of what is feared.

## HABITUATION AND EXTINCTION: ENDING INACCURATE ANXIETY RESPONSES

Habituation and extinction make up the backbone on which all exposure treatment is built. Habituation and extinction are the pivotal parts that collectively represent the mechanism of change contained within exposure

exercises. They are distinct aspects of change, but both are required for long-term and meaningful reduction in anxiety and fear. Habituation and extinction are why exposure "works" and can only be achieved through exposure and repeated exposure.

The human body is a beautiful instrument of conservation, in that it tends to stockpile materials (e.g., adrenalin, endorphins, fat) needed for high-demand activities when they are not being actively used. This conservation tendency ensures that such materials are available when it really counts, and at other times of high use (e.g., athletics, hard physical labor). This response translates into a relatively quick return to not using such fuels as soon as the expenditure is no longer needed; in other words, if there is no adversity to face, or the challenge is removed, then the immediate and preferred response is either to not spend these precious commodities to begin with, or else turn off the expenditure as soon as the threat is removed. The human body wants to conserve, not waste. In a modern world, devoid of most meaningfully dangerous threats, this central tendency for storing and saving has turned into the bane and torment of people concerned with fitness and health.

Nonetheless, this phenomenon translates further into something even more beautiful, namely that anxiety is naturally self-limiting. It has to be. Because of the primitive tendency to conserve, anxiety, in the absence of something to fear, will stop. Recall that anxiety is an autonomic reaction that is largely biophysical, and that such response depends on the exact fuels the body wants to conserve in the absence of true threat. Anxiety, therefore, will not continue indefinitely, even though many patients often report it feels that way. It will stop when the conclusion is reached that there is no threat and the expenditure of the precious fuels is a waste, or the body is no longer able to pump out those products. Either way, anxiety is a self-limiting experience. It does not and can not last for forever.

This self-limiting nature should be very welcome news indeed to people who struggle with anxiety. However, people who suffer and struggle with anxiety, especially those with clinically elevated levels of anxiety, tend to not benefit from this self-limitation. This unfortunate reality is due to people's general intolerance for feeling uncomfortable. Hedonism suggests that people will do something to try to feel better when they feel bad. People are broadly intolerant of negative states, almost regardless of the domain involved (e.g., thoughts, feelings, physiological). In short, many people, especially those with significant anxiety, will be too impatient to wait around for natural relief and decline in arousal. They are too uncomfortable, and want to feel better as soon as possible. It goes against hedonistic tendencies to simply sit back and wait for such a desired change to occur. Running away (i.e., escape) feels better faster than waiting it out or looking fear in the face and waiting to

see what will happen. Keep in mind, too, that all of the fuels dumped into the bloodstream and muscles are meant to help someone run or fight (not sit still!), so the person is already primed toward action. In this prepared state, running is easy and staying is hard.

People who are highly anxious tend to escape (Figure 2.2) from the circumstance that makes them feel bad. When they do so, their anxiety is often quickly reduced because they "escaped" the danger (which the physiological reaction signals *must* be there) and lived. Unfortunately, because of conditioning, the person has learned that the stimulus *is* dangerous (i.e., it has to be true that it is dangerous). Emotional reasoning often reifies this mistaken belief into an absolute truth that simply is not challenged, but is instead acted on as if the stimulus really is dangerous. Why else would they have escaped? Would it be necessary to escape if the stimulus was benign or nonthreatening? No. The action of escape *confirms*, or reifies, that the feared stimulus deserves being feared. This circular reasoning gives the fear credence. Otherwise, from a conservation mode or frame, it was all a waste. It also teaches the person two other, very important lessons that ironically set him or her up to continue being fearful in the future. First, if ever faced with the same stimulus again, or something similar, the person comes to think he or she should repeat the behavioral response set (i.e., escape) because it "worked" (i.e., distress reduced). Second, the person begins to believe that he or she should just avoid that stimulus altogether, because the expenditure of precious materials would not have to be performed if the stimulus were not encountered. Unfortunately, it is the rare fear that is so circumscribed, however, that it can be easily avoided in the world. Fears often generalize and make more parts of the world appear threatening because of the original fear. This operates through operant conditioning, which carries an enormous amount of capacity to form associations and connections from an original stimulus to both concretely and vaguely related stimuli. Nonetheless, conservation is always preferable, and easier to expend, and it is "safer" because a person is left with more rather than fewer reserves for another, future need. Conservation is easiest to achieve through avoidance of what would require action.

A significant problem with this mode of operation is that in an avoidant and escape model of survival, people can never find out what will happen if they actually looked fear in the face (i.e., faced what it is that makes them react and respond with anxiety and fear). They never obtain the evidence to either refute or support their beliefs, which then support their actions of escape or avoidance by default of being relatively all right when they do use such responses; after all, when they avoid or escape, the feared immediate outcome fails to occur. How can they, then, know if they are economical with how they are spending their fuels?

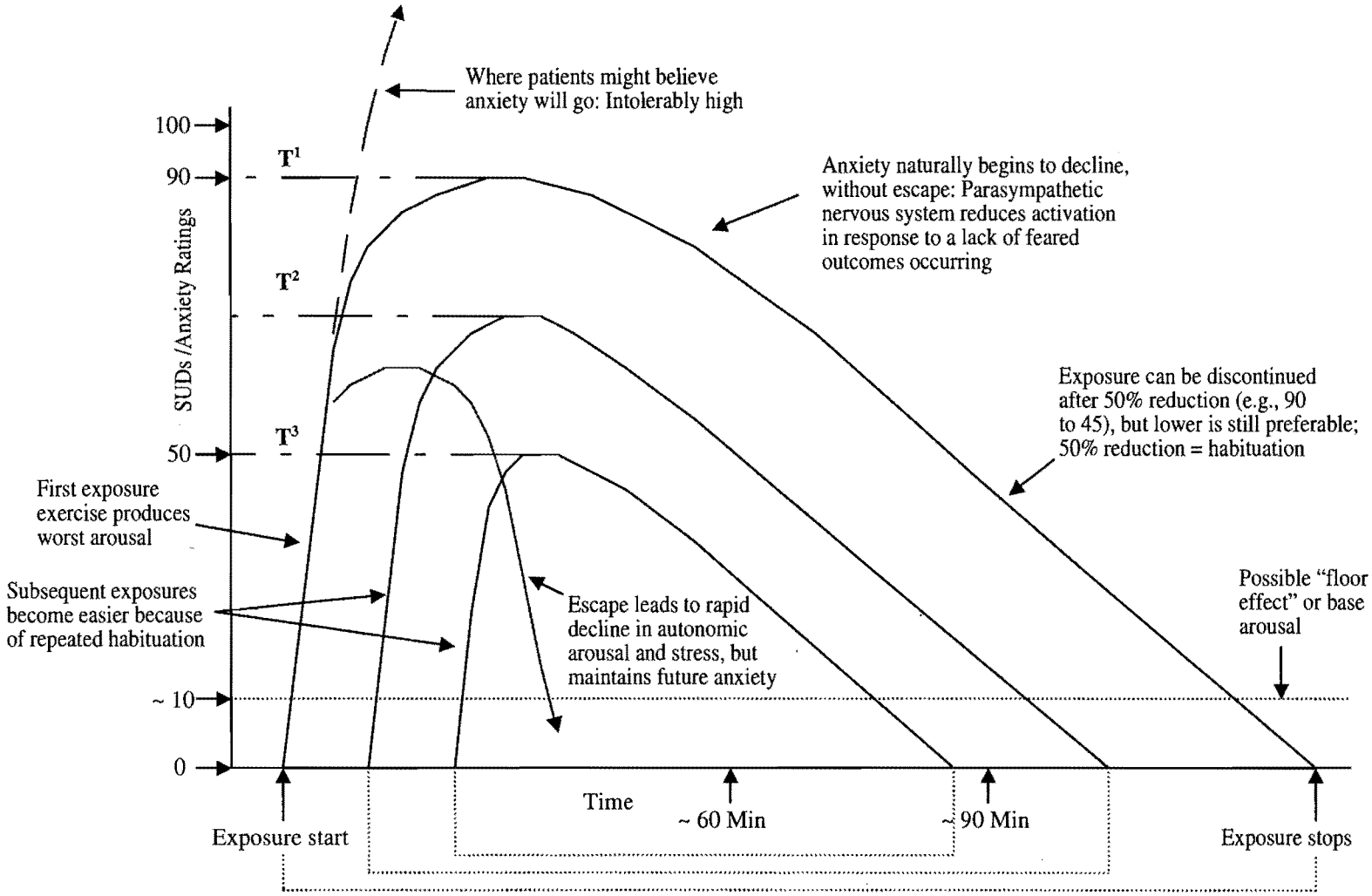


FIGURE 2.2 The normal, natural habituation curve and maladaptive escape curve.

Two-Process Theory (Negative Reinforcement) and Process

| | Hedonistic Principle (Negative Reinforcement) Response Model | Exposure Paradigm (Endure Discomfort) Response Model |
|---|---|---|
| ***Stimulus:*** Trigger[2] situation | ↑anxiety (or equivalent) | ↑anxiety also |
| ***State 1:*** Aversive | Feel "bad" | Feel "bad" |
| ***Reaction:*** Desire to feel better (Hedonistic drive to ↓ "bad") | Escape[1] behavior response | NO escape response |
| ***State 2:*** Less Aversive/Good | Feels relief, quickly ↓ anxiety | Feels relief, but more slowly; nonetheless, ↓ anxiety still |

Note: Escape[1]and Trigger[2] are net lessons: Escape behavior produces the relief and avoids the trigger in future.

FIGURE 2.3 Two-Process Theory: Hedonism versus exposure outcomes.

They cannot know, and therefore they keep spending, because continued expenditure continually allows people to feel all right in the moment. Thus they keep reacting with arousal because they have no evidence to the contrary that they should not. They keep reacting with stress to stimuli that do not warrant such reactions. They have become inaccurate in their response, reacting to more and new kinds of stimuli because their system is constantly pumping out chemicals that should be present only during danger. If they feel like something is dangerous, because physiologically it seems to be supported, then it becomes dangerous. Therefore, they become increasingly inaccurate, and respond more and more easily as they become more and more vigilant to all of the threats and danger they now perceive in the world.

Exposure, on the other hand, allows them to see this inaccuracy and helps them see that they are spending fuels at unnecessary times because it asks the person to not run away (Figure 2.3). When a person follows the hedonistic core programming, they principally learn that they need to use escape behavioral response sets to feel better, and that they should avoid the offending trigger in the future. In this sense, they become dependent on

escape-based behaviors and become largely avoidant so they will not have to employ the escape-based responses. Because escape could conceivably fail, it will always seem (from the hedonistic point of view) that avoidance is a better response base, a "safer" choice. This exact preference is what sustains fears long-term, because nothing contradictory can be discovered through avoidance. Instead, what a person learns in the exposure is that feeling better does not require any action per se, but that feeling better can actually happen naturally with time, presuming the threat actually does not represent any real danger. Additionally, they learn the feared outcome did not occur, so an escape response would have been superfluous. Indeed, they most importantly learn that it was not necessary to respond with anxiety and fear, and that anxiety is actually self-limiting. With repetition of exposure, the body gradually stops responding in the presence of the previously feared stimulus because it has learned through experience it was not a threat. Repeated habituation, therefore, is what produces extinction.

Extinction means the person no longer responds with anxiety and fear to the stimulus, and the old response set has been made obsolete. Earlier exposure will always seem more challenging to patients, because they have little evidence yet to contradict what they believe and their bodies are consequently quite reactive and responsive when presented with the feared stimulus. However, as exposure is repeated, the exercises should seem increasingly easier (presuming the same exposure is repeated), because accumulating evidence informs the person of a more accurate estimate of the state of affairs in which the reactivity is gratuitous. This between-exercise reduction in challenge/difficulty is often called between-session habituation. Although within-session habituation is important to achieve, between-session habituation is even more important because it theoretically demonstrates some deeper integration of new information about what is dangerous and what is not. A lack of between-session habituation (i.e., the same exposure exercise remains as hard as the first time, or first few times, during subsequent exposure) signals a lack of new learning and should be carefully monitored for. A careful investigation should be conducted to see what might be contributing to a failure to integrate longer term information about threat, especially when within session habituation occurs (see chapter 5 for some possibilities).

Four factors broadly influence the basic effectiveness of exposure: frequency, duration, severity, and latency. In terms of *frequency*, the more often a person can have contact with that which he or she fears, the more quickly unreasonable fears can be deconditioned. Intuitively, this makes sense in that with little contact, very little experience will be gathered that directly contradicts what the person believes to be true. More experience

simply gives more opportunities to experience the threat as not threatening. How often the patient engages in exposure to face his or her fear is the first factor known to influence how quickly suffering is reduced. Roughly speaking, this means patients should engage in exposure exercises *often*, which typically means they should do exposure-based exercises between formal therapy sessions. This is, in part, why homework plays an important role in any exposure-based treatment package. Homework will also be important because it is preferable and pivotal for the patient to also engage in exposure work without the therapist present. Reasons for this will be explained in a later section.

In virtually the same tone, *duration* of exposure is important, if not absolutely critical, because it pertains extremely closely to habituation. It directly relates to habituation, in that habituation cannot occur unless there is a 50% reduction in personal distress (often termed Subjective Units of Distress [SUDS], which is often placed on a scale). A half-reduction in SUDS cannot be accomplished instantaneously; therefore, it will be crucial to continue the exposure at least until such a half-reduction has been achieved. If a sufficient amount of time is not spent, and habituation does not occur, the exposure will be ineffective. For most patients, a time frame of 1–2 hours is sufficient for normal habituation to occur. After they become accustomed to the exposure exercises and build some experience with finding or discovering that their worst fears do not come true, habituation can typically be accomplished in less time (e.g., 30–90 minutes). Ultimately, the SUDS ratings will determine whether it is prudent to exit the exposure situation, because exiting before the half-reduction is akin to escape and is detrimental to overall treatment progress.

*Severity* does not necessarily refer to the idea of only how difficult the exercise is, but is instead meant to ensure that a patient does not stay with a range of "safe," easier exercises that may be found low on a difficulty hierarchy. If the patient never performs any challenging exposure exercise, he or she is staying away from the fear, and a meaningful reduction in that fear is prevented. Severity means that the patient will have to face more difficult items in a fear hierarchy to ultimately overcome the fear. This does not mean that a practitioner should start the patient with hard items or what resides at the top of a fear hierarchy, because doing so would be engaging in flooding. Although flooding is a recognized exposure technique, it is not as effective in the long term, nor is it as tolerable for the patient. Starting in the bottom half of a fear hierarchy is important for many reasons, but principally ensures a greater likelihood of success and completing the treatment. Starting close to the top of a hierarchy, or moving too fast up a hierarchy, is one way to almost guarantee attrition and premature termination of treatment.

| *Situation* | *Fear Rating* |
|---|---|
| Driving over the Steel Bridge at rush hour | 100 |
| Driving on the highway at rush hour, at dusk, and in poor weather | 90 |
| Driving on the highway at rush hour, in good weather | 80 |
| Being a passenger on the highway during rush hour | 75 |
| Driving on the highway in the middle of the day, in good weather | 65 |
| Driving on a city street at midday, when it is raining | 65 |
| Driving on a city street at midday, when the sky is clear | 50 |
| Turning onto a city street during traffic hours | 45 |
| Driving in a busy parking lot during business hours | 35 |
| Driving in an empty parking lot during "off" hours | 25 |

FIGURE 2.4 Sample fear hierarchy for overcoming a phobia of driving.

*Latency* refers to timing. Specifically, it means how quickly after the command to start the patient begins. Procrastination and an unwillingness to start after the instruction has been given to commence cements further the credibility of the fear. If it had no truth to it, why would the person hesitate? The more the person waits and *avoids*, the more the feared stimulus remains feared. Indeed, poor latency (longer avoidance and hesitation) tends to make the fear worse because a lot of hesitation in approach behaviors is registered emotionally in the survival networks as signs of true threat. Hesitation reifies the fear.

Exposure work always begins with collaboratively establishing, or building, a fear hierarchy. The hierarchy is made up of increasingly difficult situations related to what is feared. For example, for someone who is afraid of crashing if he or she drives a car, that person would start in the lower part of the hierarchy, where "safer" driving tasks would be encountered (e.g., drive around an empty parking lot). Because success is realized in lower items (i.e., habituation is accomplished to lower items), then the patient moves on to the next harder step. The sequence of exposures moves the patient from developing comfort with the confrontational task with lower items (which may still be perceived as challenging in the beginning) to facing his or her most challenging obstacles and fears. For example, for the driving phobic, a last step might be driving across a challenging stretch of road or bridge under poor conditions (e.g., rush-hour traffic, rain, dark). Each step might also be broken into two-part stages, in which the first times the stage is performed, it is done when accompanied by the practitioner or significant other who has been recruited to support and facilitate the exposure exercises. Either way, the hierarchy progresses in challenge (Figure 2.4).

It is important that patients actively collaborate with the practitioner in developing the hierarchy, because no one knows the exact nature of the fears better than the patients themselves. Because of avoidance, patients may not be entirely in tune with the complete and full nature of the fears,

so they may actually really need the assistance of the practitioner in more fully exploring the fears to be able to construct a meaningful hierarchy. A more common problem is that patients can readily identify what is at the very top of the hierarchy, or what is the most challenging, and what is really at the bottom, or what they can probably already realistically do with just some extra discomfort. The net effect is that there is no gray zone between the two, and without this, there is no material to "work up" with. With the material being bimodally distributed between "easy" and "hard" items, there is nothing that incrementally moves the patient closer to the end goal. If there is no such middle ground, then the patient would have to make a leap from easy to hard. This is often the byproduct of avoidance, in that as soon as the difficult stimulus is encountered, the patient escapes, learning no in-between approximations. Thus, without something "doable" in the middle, the patient might believe the distance between the bottom and top is too large, and he or she is probably right. Most patients experience large amounts of distress when they undergo flooding because there has been no preparatory middle-ground success. The leap straight to the top items may indeed be too hard, as the best literature suggests is true. In this sense, flooding, or going from easy (i.e., what people can probably actually do with some minimal prompting already) right to what is extremely hard (i.e., what they believe they cannot do, and consequently have not done), might just be bordering on cruel, unless patients request that type of approach specifically. Some people who have only a limited amount of time to spend at getting over their fears, such as an executive who literally has all of 2 weeks away from nonstop working in any given year, may even choose to go with flooding over gradual, hierarchical exposure because of pragmatic constraints.

## PROCESSING CONNECTIONIST NEURAL NETWORK (PDP-CNN) MODELS

Tryon (2005) has offered perhaps the most scientific explanation for just why exposure therapy works. As with other authors (e.g., Rosen & Davison, 2003), he has put forth a strong argument that psychology should only list empirically supported principles of change, instead of trademarked, proprietary therapies (e.g., Barlowian panic control treatment). Listing such therapies, instead of the principles underlying such treatments, can promote and even facilitate the unfortunate establishment and proliferation of unscrupulous practitioners developing "new" therapies by adding one or more functionally inert components to already existing, established efficacious treatments. Although there may be agreement and professional/ethical requirements that only reliable and

valid psychological tests should be used in psychological assessment, less consensus regrettably exists for psychotherapy. Tryon (2005) accurately suggested that the extent to which interventions are to be based and informed by scientific research is one of central professional debates of psychology today. Indeed, much has been accomplished in identifying interventions that meet minimal scientific standards (Sanderson, 2003), but this professional developmental push has not been without its opponents and strong critics (e.g., Hebert, 2003). It has been suggested that perhaps this opposition stems from the accusation that empirically supported treatments (ESTs) do not provide sufficient explanatory context for understanding patients' presenting problems. Although it would theoretically be possible to administer invalid or unreliable assessment measures or tests, most prudent practitioners (if they knew about lacking validity/reliability) would likely decide against such questionable action; similarly, many may feel that action without sufficient explanatory context is bordering on questionable or even unethical practice. Therefore, most practitioners will opt for a set of actions that most fully explain patients' issues, even if those actions mean they turn to "comfortable" theoretical tradition and interventions with which they are familiar (regardless of degree of empirical support such positions hold).

The surprisingly broad gap between science and practice flagrantly points to this practitioner need or desire to explain, even at the high price of empirical support (Tryon, 2005). Indeed, empirically derived outcome findings alone appear not enough to prevail on practitioners to use ESTs! Since the inception of ESTs, this lag of practice has been the norm, and it does not appear to be changing quickly toward any greater reliance on and use of ESTs. Capitalizing on this desire (possibly necessity) for explanation may in reality be how more practitioners could be increasingly persuaded to turn to empirical methods through scientific explanations of just how and why such interventions work. Understanding the hows and whys of ESTs turn them into empirically supported principles, and may provide the descriptive power practitioners appear to seek. Therefore, researchers and practitioners alike (e.g., Shapiro, 1995) are increasingly promoting that psychotherapy research should focus on just how effective therapies work, so that attention can be turned to matters of explanation as well as prediction and control. For instance, although philosophy and religion may explain much of what people want to understand, they can predict little that could be empirically verified or perhaps even falsified. Empirically supported principles, because they represent a shift back to or a return to scientific principles, just as hypothesis testing does, are capable of providing *both* explanatory theories and testable predictions. Mature sciences should provide capacity for explanations and prediction (Proctor & Capaldi, 2001; Tryon, 2005). Because principles behind

how and why exposure therapy works have not been well explained, there may be a reluctance to adopt it as a treatment approach; thus, increasing insight into just how it does work (i.e., make its principles of change transparent) should promote its more widespread adoption and utilization. The burden of "proof" (a counterintuitive scientific term) rests with proponents of exposure therapy, not with its opponents. To date, proponents of exposure therapy may have correctly explained and fully described intervention effects of exposure, but as to a cogent and complete etiological explanation of anxiety disorders, its proponents may have fallen short. Indeed, a lack of widespread dissemination of ESTs may be disquietingly pointing to a remaining necessity to actually better *explain* therapeutic effects of exposure, rather than through predictions of outcome. Explanation and prediction, when truly given together, will describe more than necessary and sufficient procedural ingredients within exposure therapy, and thereby increase dissemination. This remaining need for explaining therapeutic effects has led researchers and practitioners alike to innovative mathematical and scientific models of memory mechanisms that learn, called PDP-CNN.

Psychotherapy is based on the fundamental principle that people learn. Tryon (2000) extended this basic premise to argue that learning plays an etiological role on psychological and behavioral disorders of all sorts, and that all people who benefit from psychotherapy learn something. In other words, learning is the active and necessary ingredient in change. Learning is perhaps the single most uniform empirically supported principle within psychotherapy; therefore, dissemination of exposure therapy hinges on better (scientific) explanations of learning within exposure. Learning is further based on memory and retention, and, as it turns out, there are many common biological structures to learning and memory, leading most scientists to see the two as interdependent structures and functions. From this stance, neuroscience has explored mechanisms of learning and memory, and this work has led to the development of formal network learning theory (e.g., McClelland & Rumelhart, 1987; Rumelhart & McClelland, 1986).

This careful examination of learning and memory has led to the acceptance that learning entails synaptic change, or brain plasticity. PDP-CNN models rely on mathematical models and equations to simulate synaptic change across learning trials (Tryon, 2005). Synaptic change has been proposed to imply a neural network architecture made up of a hypothetical three-layered feed-forward network of nodes. In such an architecture, all nodes in each layer are connected to all other nodes in adjacent layers so that nodes in the top layer are not directly connected with nodes in the bottom layer, except through the connective nodes in the middle layer. Connections between nodes and layers can be excitatory

or inhibitory, as demonstrated by either positive (activating) weights or negative (not activating) weights. In this sense, layers of networks are made up of nodes (neurons) and connections between such layers (synapses). During learning and memory, activation "cascades" across the network, activating and inhibiting certain combinations of nodes, depending on synaptic weighting of connections for certain stimuli. Based on connections and weighting combinations, not all nodes are activated or necessarily activated or inhibited in the same combinations. Instead, stimuli have to go through a filtering (conceptual/abstraction) level before a response is produced or selected. The top layer receives stimulus input, as provided by perception processes. The middle layer is formulating concepts, which feeds to the bottom layer, where fitting behavioral responses are formed and elicited. Together, this cascade of connections and weights transforms sensory and perceptive data to behavioral responses. Depending on sign and magnitude (weighting) of connections, this transformation influences what the network "thinks" and "feels" about particular stimulus or setting events (Tryon, 2005). Through translating this network processing explanation to physical and chemical processes, psychology can move into the same arena as more mature, "hard" sciences, such as biology, chemistry, and physics (Wilson, 1998). Learning, or the mechanisms and effects of psychotherapy, entails changing size and sometimes the sign of connection weights that are related to constraints in a network processing cycle. Constraints can be thought of as limitations or restrictions that influence a person's capacity to reach the best possible solutions; the more important constraints that are satisfied, the better the solutions derived. Resolving constraints, through learning and memory activation by input, is largely what network theory describes. In this sense, PDP-CNN resolves dissonance to satisfy as many competing interests and constraints as possible, and settles the networks of nodes and connections into the best possible compromise (consonance) solutions possible to whatever problem is at hand (Tryon, 2005).

For some, this innovative and complex biological, chemical, and physics model for understanding humans may be intimidating. However, although the language may be more involved, practitioners are well familiar with the components that really make up this model for how to understand why and how people function. Practitioners know full well that their patients come to them, seeking services, with an already well-established and long developmental history. The top layer of nodes can be thought of as the results of sensation and perception within this history. Middle layers of nodes comprise various facets of cognitions and emotions, and the bottom layers are behavioral response repertoires that have been configured over such histories. The cascading process through these layers of nodes and connections arbitrates how individual patient's

perceptions have given rise to fear-related cognitions, emotions, and behaviors. Practitioners' tasks involve creating dissonance and network instability, so that, through new learning cycles, new consonant states can be configured, which presumably will contain more reasonable response sets. Through presenting fear-related information, as is done in exposure therapy, patients behave "therapeutically" in that they engage in some desired output mode while faced with fear-related information. This is often referred to as "clamping" an output node, which creates network instability. Subsequent change occurs because patients' networks will seek consonance (i.e., decrease dissonance within the network) through an iterative gradient descent constraint satisfaction process wherein the learning process modifies connection (synaptic) weights, thereby producing network weighting that is consistent with desirable behavior as represented by output or response levels. Changing the weighting across the networks therefore makes stimuli cascade across the network into desired therapeutic responses, and through this process, new cascading patterns change causally mediating cognitions and emotions (Tryon, 2005). This PDP-CNN model of change allows sufficient explanation and prediction and has support from a variety of important, more developed sciences (e.g., neuroscience, neuroimaging, computer simulation). This model, as well as earlier, less neuroscientifically oriented models, points to the well-established fact that exposure works. The PDP-CNN model offers insights into just how exposure works.

## TYPES OF EXPOSURE

There are a multitude of different versions of exposure formats, each being uniquely suited for particular types of fears, or serving a particular purpose. Each type of exposure will be discussed in turn.

### In Vivo

Live, or in vivo, exposure is the all-time classic for exposure. It has served as a cornerstone for behavior therapy for decades (Hazlett-Stevens & Craske, 2003). Interestingly, more dynamic theoretical orientations (e.g., psychoanalytic, Gestalt), which are often critical of behavior therapy's "simplistic" focus on symptom relief, have relied on exposure techniques to treat neuroses (Foa & Kozak, 1986). Live exposure means that the patient is asked to confront, in real-life and real-time, the actual feared stimuli, whether gradually or more quickly. That is, if a person is afraid of spiders, for example, he or she would be asked to eventually handle spiders,

although typically after working up through less directly confrontational exposures first because graduated exposure is more tolerable than flooding and has superior long-term effects.

One of the most recognizable forms of exposure has been *systematic sensitization*, first developed and used by Salter (1949) and Wolpe (1958). In this type of exposure, the patient is first taught how to deeply relax, and, once relaxed, the feared stimuli are gradually presented. If the patient finds he or she is becoming more tense, or more nervous and anxious, the stimulus is withdrawn until the patient can become deeply relaxed again, and then the stimulus is re-presented, again in a gradual fashion. The objective of this strategy is for the patient to be thoroughly relaxed in the presence of a feared stimulus, because this would intuitively and biophysiologically signal that the stimulus cannot be dangerous or threatening. After all, the human body is supposed to react with autonomic arousal in the presence of something threatening, so if the body is thoroughly relaxed (typically accomplished through progressive muscular relaxation), then the surroundings must not be threatening. Systematic desensitization capitalizes on the normal and natural anxiety reactions that should occur in the presence of danger, in that it sets out to fool or force the body into behaving in a relaxed fashion around something that is perceived as being bad by the patient. In doing so, the strategy makes the stimuli nonthreatening because the body ceases to be responsive to the threat.

There are two fundamental critiques of systematic relaxation and relaxation, in general, and their use in exposure. First, to be "successful," one has to be relaxed in the presence of aversive or noxious stimuli. This may work reasonably well for stimuli that have been deconditioned this way, but less well for new ones. The problem inherently is the idea that people are naturally aroused to a degree (i.e., base arousal; see Figure 2.1), and novel stimulation typically will increase such arousal. It is unreasonable to expect that people will be able to walk around life completely relaxed all of the time. People will become aroused in the presence of either stress or novelty, and they may not always be adept at relaxing or circumstances may not always be such that relaxation is appropriate. This represents a significant problem. The second significant issue with relaxation is that being relaxed precludes the possibility of habituation. Habituation simply cannot occur when a person is very relaxed, because a half-reduction of arousal simply is not feasible in the presence of a floor effect, or base arousal. Simply put, if the person is not more highly aroused, then he or she might not be able to experience enough relief that the body concludes the stimulus was not threatening after all. Without habituation, true extinction is not possible; therefore,

relaxation has been very controversial in connection with exposure-based work (e.g., Borkovec & O'Brien, 1976; Craske & Barlow, 2001; Foa & Franklin, 2001; Foa & Kozak, 1985; Heimburg et al., 1990; Levin & Gross, 1985; Öst, 1996). Although the topic is controversial, it can be suggested that relaxation during exposure is contraindicated, generally; however, during much exposure work, diaphragmatic breathing is often used to keep patients from completely panicking while facing very difficult challenges (i.e., on a SUDS rating, keeping the arousal level to a 9 or 9.5 versus letting it become a 10). There are two important reasons to do so. First, if a person becomes completely overwhelmed and too highly stressed, he or she may leave (escape) the exposure before habituation occurs, which would cement further the irrational beliefs of danger and would serve to unnecessarily prolong treatment, presuming the patient returns. Second, when a person is completely overwhelmed, the last "F," or faint (dissociate, shut down, not be present), may occur. That is, the person may go into a self-preserving mode in which he or she is not present during the exposure, which is akin to avoidance; obviously, this also prevents habituation.

Critically, during exposure, patients must not do anything to diminish what they are supposed to be experiencing. That is, they cannot distract themselves, pretend they are somewhere else, think that what they are experiencing is not real, and the like. In other words, they must not do anything that detracts from what they are to experience. If they do, then that is similar to escaping. Therefore, it behooves the practitioner to watch carefully for very quickly falling SUDS ratings, because such a phenomenon might be indicative of some sort of escape behavior, even if patients remain in the presence of the offending stimulus. SUDS should be reduced slowly at first and then gradually begin to fall more quickly as about a half-reduction is realized; patterns other than such a gradual decline of arousal should be highly suspect and questioned as to whether patients might be engaged in some (unintentional) avoidance or escape behavior, whether overt or covert (e.g., not looking at the stimulus or thinking about something else). During exposure, the task is to focus on the stimulus and all of the danger that it represents, and nothing else that might shift attention away from it.

Some patients might not be willing to face their fears in this live format, although if done in a gradual, tolerable fashion, this typically does not present a significant problem. To combat this problem, exposure exercises will typically be conducted in the presence and under the guidance and support of the practitioner. The practitioner will model and demonstrate first, then ask the patient to also perform the exposure task. In this fashion, the patient gets to see, firsthand, exactly what he or she is supposed to do and then is supported and encouraged by the practitioner. After the

work moves up the hierarchy, and more challenging exposures are performed in this manner, then lower items (already successfully performed) are assigned for the patient to perform independently (without the practitioner's presence and support) for homework. The practitioner should never push the patient into performing exposure exercises that he or she is not ready for or willing to do for ethical reasons, but also because if a patient performs a task only because the practitioner *made* him or her do it, then it will not be integrated as something that the patient really conquered. That is, such patients know full well that the only reason they did what they did was because of the practitioner, and they would never have been able or willing to do it if it was only up to them; therefore, if left to their own whims, they typically will behave as if the item has *not* been overcome and conquered. In fact, because of the likely stress and trauma potentially being involved with being pushed hard to do something they were not ready for or willing to do, the item may seem even harder to approach. Thus the strong and emphatic recommendation is to—under no circumstances—push patients into performing exposure exercises that they are not ready for or willing to do. In this respect, the only contraindication for exposure, and in vivo exposure particularly because it is exposure's most potent form, is an unwillingness to engage in exposure treatment and possibly three other conditions.

Exposure might be contraindicated for someone with cardiovascular disease, such as heart disease, because the arousal that can be brought on by exposure exercises might be too taxing for such conditions. Careful and complete consultation and collaboration should be standard practice for patients with medical problems, because a genuine risk for physical harm should be clearly ruled out. Only a qualified medical doctor can make such critical determinations, and for patients with medical conditions, close consultation should be ongoing throughout the active treatment phase. For some patients who exhibit the vasovagal syncope response, it may be necessary to alter treatment slightly to first teach them how to prevent fainting through applied tension (e.g., Öst, 1987, 1988a, 1988b; Öst, Fellenius, & Sterner, 1991; Öst, Lindahl, Sterner, & Jerremalm, 1984; Öst & Sterner, 1987; Öst, Westling, & Hellström, 1995). Exposure might also be against common sense for someone who is living in a genuinely dangerous situation of domestic violence. In the treatment of posttraumatic stress disorder (PTSD), there is often work conducted on feeling all right about being out and about in the world again, to reduce and eradicate beliefs that the patient's perpetrator or abuser will hurt him or her again, and to gain a better sense that the world is really a more moderately safe place. However, if there is any significant risk that the patient might actually run into the past abuser, then exposure that

asks him or her to put him- or herself into vulnerable positions would be contraindicated. In such situations, live exposure might be eliminated or reduced in favor of in-imagination exposure. Last, exposure might not be a realistically helpful approach for psychotic or delusional patients, because exposure exercises might trigger problematic episodes. Again, careful collaboration with other treatment providers and prescribers in such circumstances would be warranted and should be deemed necessary before work with such patients using these methods can begin.

Nonetheless, some patients feel incapable of directly addressing their fears, and in such cases it may be useful to start with facing the fears in-imagination, or other "pretend" ways, such as virtual reality.

## In-Imagination and Virtual Reality

Although in vivo exposure appears to be more effective than in-imagination, or "imaginal" exposure, there are many circumstances for which imagination-based exposure work is more appropriate. First, patients, as mentioned, might not be willing to face the real stimulus, but could be willing to face it in imagination. For this reason, some of the initial, worst reactivity and distress about provocative stimulus are reduced through in-imagination exercises, so the patient can move on to face fears in vivo. Some situations, such as lightning, thunderstorms, and tornados may realistically be impractical to recreate in vivo. For instance, one patient presented with PTSD after being injured in a landslide (see chapter 4); in that case, finding such events were essentially moot, so proceeding with in-imagination was necessary. Last, there may be situations that would simply be too dangerous (not to mention unethical) to replicate in vivo. For instance, treating a motor vehicle accident PTSD patient by having him or her crash cars would not be practical, safe, or ethical; in short, sometimes in-imagination (or other non-in vivo) methods represent the only prudent course of action.

In-imagination exposure suffers from the real dilemma of not being real. It is fantasy; that said, some people are capable of having such a real fantasy life that it appears as realistic as real life. On the other hand, many people are not cognitively flexible enough to be able to create enough detail for imaginal exposure to be effective. It is clear that people just vary in their imagery ability (Kosslyn, Brunn, Cave, & Wallach, 1984). For in-imagination work to be powerful, it has to seem real. Stimuli appear real when they manifest the capacity to tap multiple human senses (i.e., sights, sounds, smell, taste, tactile); that is, the more senses involved in imagination work, the more real seeming and effective the exercise will

be (Borkovec & Sides, 1979). Reality will be important, if not critical, for translation purposes to real-life stimuli. Other important factors in bringing imagination alive, such as the more conventional human senses, are also proprioception (sensing the position of one's body in space) and human emotion. The more emotion and sense of physical and emotional involvement with the imaginal scene, the more real the situations will seem.

A technology that has been used to enhance in-imagination exposure is virtual reality (VR). Although in its developing form VR seemed much like a first-generation computer game (i.e., not real seeming), the current VR technology is much further advanced, to the degree that it can predictably and more readily induce the kinds of autonomic reactions necessary for habituation and extinction. Notable, when VR is used it typically follows a graded format and is then suitably called VR-graded exposure therapy (Wiederhold, Gevirtz, & Spira, 2001). VR allows people who are low in imagery ability to derive more benefit from imagination exposure, because it helps them to imagine in much more graphic (pun intended) detail what they are to experience during exposure. Indeed, VR does not have to rely on a patient's own internal capacity for internal imagery, but instead introduces an external source to "trick" the brain into being more creative. On a low-technology end, this is often done with pictures and audiotapes, too, but VR encompasses obvious advantages and potential drawbacks (e.g., cost and availability). Besides producing more realism into imagery, VR is also safer (as is standard in-imagination exposure) than in vivo exposure. It allows the person to sit back in an artificial but otherwise safe environment and experience aversive stimuli. The artificiality of the treatment approach may have theoretical, negative impacts on relative effectiveness when compared with live exposure, but then any exposure that is not live will suffer from the same predicament of the patient ultimately knowing that what he or she is doing is *not* real. This can be akin to a safety behavior or mechanism that will diminish the impact of the exposure, ultimately reducing the comparative effectiveness to when a person encounters a real stimulus (Rosqvist, Sundsmo, MacLane, Cullen, Clothier Norling et al., in press). Nonetheless, VR exposure has good support as being an effective treatment strategy for common anxiety disorders, such as claustrophobia (Botella et al., 1998; Botella, Villa, Banos, Perpina, & Garcia-Palacious, 1999; Bullinger, Roessler, & Mueller-Spahn, 1998), arachnophobia (Carlin, Hoffman, & Weghorst, 1997), public speaking (Botella et al., 2000; North, North, & Coble, 1998), driving (Jang, Ku, Shin, Choi, & Kim, 2000; Wiederhold & Wiederhold, 1999), and social phobia (Wiederhold & Wiederhold, 1999).

## Loop-Tape, Disaster Scripts, Pictures, and Other Methods

There are many ways to enhance imaginal exposure and they all aim at bringing into play a mix of human senses, emotion, and motoric behavior. Exposure by loop-tape is a common method for burning out reactivity to noxious stimuli, such as words, sounds, and sentences. It is also commonly used to enhance and supplement in vivo work by bringing into play aspects that otherwise could not readily be present in a situation. For instance, for the obsessive-compulsive disorder (OCD) patient "Catherine" in chapter 1, adding a loop-tape with the message "pedophile" increased the challenge (and effectiveness) of the live exposure of watching children in the park. This may be necessary to thoroughly extinguish aversive thoughts that might otherwise continue unchecked. Rachman (Emmelkamp, 1982) conceptualized intrusive thoughts, images, and impulses as *aversive stimuli* that are commonly and effectively treated systematically by exposure by loop-tape (and pictures for imagery material), so that the patient can habituate to the thought content. This procedure can also be effective in reducing extreme emotional reactivity to such intrusions, and thereby lowering overall daily distress levels. Reducing this kind of maladaptive overreactivity appears to also allow more patients to effectively engage in vivo exposure (van Oppen & Arntz, 1994; van Oppen & Emmelkamp, 2000; Wilson & Chambless, 1999). With too much charged content, it may simply be too much to face live exposures.

For practitioners unfamiliar with how to create a loop-tape, there are no steadfast rules, but several guiding principles exist. By definition, a loop-tape is a cassette tape without a true beginning or end, where it is instead an endless loop. The most common standard use for such tapes in more conventional ways than psychotherapy is for answering machines. Historically, answering machines contained different tapes. One tape was a loop-tape, typically only 20 or 30 seconds long, but sometimes up to a couple of minutes, which contained the greeting message (e.g., "Hello, the Johnsons aren't home, please leave a message after the beep"), and the other was commonly a regular or standard tape on which callers would leave their messages. Depending on the machine, the second tape was either somewhat shorter to limit how long a message a caller could leave, but it was usually 45, 60, or 90 minutes so multiple callers could leave somewhat detailed (longer) messages before cumulative messages were heard and erased. For the purposes of creating loop-tapes, the first greeting tape is obviously the one of primary interest. Although many answering machines are now going to a digital format, and thereby making tapes obsolete, loop-tapes of varying lengths can still be purchased at retail

stores (e.g., Radio Shack) at reasonable prices (e.g., 20- or 30-second and 2-minute loop-tapes selling for approximately $5.00/tape). There are also specialty manufacturers of loop-tapes who make high-quality loop-tapes of various lengths, but they tend to be quite expensive in comparison to retail versions (i.e., $15.00 to $20.00 for a single tape of various lengths). As retail stores increasingly convert toward digital technology, more expensive loop-tape versions may be the only remaining option. Reasonably priced 1-, 2-, and 6-minute endless loop-tapes can still be purchased at the Cassette House (www.tape.com, 1-800-321-5738) and similar online businesses (e.g., www.tapeplus.com). However, it should be noted that *any* tape could be functionally used like a loop-tape by simply recording the content onto a standard tape repeatedly (e.g., 10–20 times), and then simply rewinding it when the last time through the "message" has been heard by the listener. Standard tapes may also need to be used if the script does not lend itself to a maximum 2 minutes, which is the longest loop-tape still available at electronics stores.

To set up a loop-tape, practitioners need to assist patients in developing a script that contains the target message (see the following section for a more complete description of developing scripts). This script is then timed when read multiple times to be sure it will fill the specific tape (length) being used. After a few rehearsals, to ensure that both the content can be fit onto the tape and patients will not stumble too much over the words, the provocative "message" is recorded onto the tape using any standard cassette recording device that has a microphone. Several recordings may need to be made before the message fits well onto the specified length and the message is delivered effectively onto the tape. The tape is then listened to for what the final product will sound like, and if it meets the requirements, it is given to the patient to listen to on a determined schedule. Because many patients may feel awkward about saying their feared scenarios aloud, they may need to practice simply saying the words multiple times to even be able to make a recording of something they more normally might have tried to not think, let alone say aloud. The words should match the language and tone with which they occur in the patient's mind, so some exploration may be necessary to discover what the actual words and their quality and quantity are.

"Disaster scripts," or written worst-case scenarios, are other common ways in which patients can extinguish reactivity to themes of content in a story format. Often, in OCD, generalized anxiety disorder, and social anxiety disorder, because they are extensively cognitively fueled, patients experience persistent and pervasive catastrophic themes, or lines of maladaptive, frightening thinking. To reduce the intrusive and aversive

nature of these story-like thinking patterns, such scripts are used to rein in excessive reactivity and personal distress.

Following are two examples of disaster scripts from a patient who met diagnoses for OCD, generalized anxiety disorder, and PTSD. She exhibited extensive intrusive, ego-dystonic thoughts about harming her children and becoming sick in various ways and dying. These kinds of thoughts caused her extensive distress, and she spent many hours each day trying to convince herself that she was a good mother and was not dying. Ironically, she was one of the most caring mothers anyone could meet, but it is a good illustration because OCD typically attacks what people care most about. In her case, it was her children and her health (which was related to being able to care for her children). Using Rachman's formulation of these kinds of thoughts as aversive stimuli, they were extinguished using disaster scripts, which were also put onto loop-tapes. The first script, below, is the most challenging script "Beth" developed during treatment. It was only developed after going through many other, increasingly difficult scripts. At first read, it is probably a difficult script to read for anyone. In light of the fact that she loved her children and would never do anything ever to hurt them, readers may wish to try to imagine having these sorts of thoughts throughout the day. When reading the script, readers should also understand that Beth wrote the script independently of detailed directions for what content to use; the only direction she had was feedback on previous scripts about how to make them "good," meaning able to provoke emotion, and a variety of human senses and emotions. She reported becoming distressed when writing the script, but was then increasingly able to read the script, and in the end (while hearing the story on a loop-tape) she was able to not become reactive to the content (i.e., her SUDS scores did not change from her base arousal levels when hearing the story script, even when there was nothing else to distract her). She had successfully extinguished the obviously horrific content, much like she had with a multitude of other scripts before. She reported feeling very relieved to not be thinking these kinds of thoughts when she was in the company of her sons, and if she occasionally had a thought like it in their presence she did not remain reactive to it. Losing her reactivity for the content meant that she lost a lot of personal anxiety and fear. The second script is based more around health and dying and is representative of what an earlier script looked like. When reading the scripts, notice all of the emotional language, and clear, descriptive detail, and the pervasive present tense; taken together, these factors make the script come to life, seem real, in a way that it results in emotions a person might feel if the situation was real. For obvious reasons, this exposure is in-imagination.

## Script 1: Killing the Children

My two sons and I are in the kitchen, preparing after-school snacks. They're both chatting amiably about their day. I'm asking if there's homework and we agree on a good time to do it. My 10-year-old son, "Alex," asks if he can have a bagel and I say, "Sure." He asks if I can cut it in half for him. I select a large bread knife from the block on the counter, and as I'm walking past Alex I'm gripping the knife tightly in my hand and I'm feeling an overwhelming urge to stab him. I am looking at the back of his shirt and imagining the knife going in. I no sooner think it, and my hand jerks forward and the blade is disappearing into him. He cries out and turns around and looks at me searchingly. He looks to me for help, not realizing what I've done to him. His eyes are wide and glazed as he stares at me in disbelief, unable to speak. He falls over and is trying to reach around himself because the knife is still in his back. Something comes over me; this rage I've had pent-up. I feel like I've done it now, and I'd better finish the job. My heart is racing and I feel like a machine, I can't stop. "Bill" is yelling, "Mom! Alex is stabbed! You stabbed Alex!" I'm telling him to shut up. I'm bending down and with a sickening twist I take the knife out and push him by the shoulder to turn him around. I'm stabbing him again, this time in the chest. He is an overweight child and I have to push the knife in extra hard. He tries to struggle, and keeps yelling, "Mom! NO!! Don't!! What are you doing?" His eyes are wide with terror and his skin is drained of color. I pull the knife out quickly this time and I'm looking him in the eye. "You stupid little fuck!" I'm repeatedly stabbing at him while he bleeds helplessly. His eyes finally shut and he stops moving. His clothes are all bloody and there's a growing pool of blood beneath him; it looks black against the brown linoleum. I've killed him, my son is finally dead. All those times I've pictured it, now I've finally done it. Bill is pulling at me but is trying not to get in my way, too. He's screaming in absolute horror. Satisfied that Alex isn't going anywhere, I take the knife out of him one last time and turn to Bill. He is running away, screaming in a crying way, and I quickly overtake him. At 13, he is all arms and legs, wiry and tall. I'm stronger, but as I grab him by the arm, he swings his bent arm upwards and nails me in the jaw with his elbow. Enraged, I get stronger. With my right hand, I stab him in the arm, missing his chest as he turns. He screams, "Why are you doing this?? Jesus Christ, you're crazy! Mom, please stop it!!" He's sobbing as he tries to get away, but I stab him all over, wherever I can get him. In our struggle, we fall to the ground. I stab him until his shirt is bloodied and he writhes on the carpet. He starts to sputter and choke and blood is coming out of my son's mouth. He is vomiting, and it's his school lunch mixed with blood. "Die, you little shit! You sick little fucks have kept me from living my life!" He passes out into death and I stand up to go look at Alex in the kitchen. His hair is matted and wet, and his face is streaked with blood.

He's still just a large lump where I left him, laying on his back in his own blood. I go to him and lift one of his hands and let go. It drops with a thud onto the linoleum, splattering blood. I've killed my children. I'm looking for the phone and see it on the counter by their backpacks and school newsletters. I call "Arthur" [Beth's husband] and tell him what I've done. "Alex and Bill are dead. I've killed them." There's a pause and in a dead voice he says, "What?" I tell him, "You better come over here...now." He's about to react but I hang up and dial "Matthew," my sons' dad. When he picks up the phone, I think how his life as he knows it is about to change. I very suddenly get very, very scared as I realize what I've done. I can't speak. Matthew says, "Hello!" again. Out of my mouth comes an anguished wail as I stare down at Alex and the reality of what I've done sinks in. I take the phone into the hallway where Bill lays and I scream when I see his lifeless body. " 'Susan'??" Matthew asks. I say, "Oh my God. Matthew, you've gotta come home. Just come home. Now...Just come home!" I hang up the phone and wait, my sons lying dead.

### Script 2: Dying of an Asthma Attack

Tonight it doesn't seem to matter that I've used my inhaler twice, I still feel wheezy. It is scaring the shit out of me because I can't take a full breath. And if my inhaler doesn't work, then I'm fucked. So I go lie down, but instead of relaxing, my breathing is becoming worse, and every breath is a chore. My lungs are feeling so small and tight, and air is just not getting in. I can't exhale and my throat is caving in with every inhalation. My mind is frantic with thoughts of having to go in to emergency. Nothing is helping. Pretty soon I'm panicking as well, which makes it much worse. I'm getting "Smith" to take me to the hospital. I don't want to go because I'm so scared and because I don't know how I will get treated with all of the cutbacks. It's raining tonight and Smith runs out of gas on the way. I am in panic overdrive now and I can hardly breathe. Smith leaves me alone in the truck while he goes the 2 miles for gas. I am so scared and panicky. I'm crying and I'm starting to freak out. My airways are getting smaller and tighter until I am gasping for every breath. I'll never make it. I get out of my seat and open the door of the van, I need to get help. But I am so out of breath that I fall down on the wet street and am too weak to get up. I'm struggling for air and for a very frightening and agonizing while I take my last breaths until my lungs can't take it and they shut down.

Imaginal exposure can also be performed with pictures and videos. For instance, Christine (see chapter 1) used a variety of pictures both of adult semiclothed and nude females and semiclothed and nude children. Much of that work was preparatory work toward doing more challenging

in vivo exposure exercises. For example, Christine went to a women's-only athletic club and used the sauna and steam room for the express purpose of being around nude women while purposely thinking some of the sexual thoughts that used to be very disturbing to her. Without doing some of the preparatory work, with pictures, she might not have been able to make the leap to being around nude women. Likewise, with children, she might not have been able to give baths to a friend's young children had she not progressed from pictures of children in various stages of dress, which prepared her for being with live children in the office. Similarly to Beth, Christine believed her thoughts meant she was a horrible person and that her thoughts must have meant that secretly she wanted to do the terrible things she was thinking. For such purposes, it might be worthwhile to point out that keeping magazines around the office will make it easier for a patient to begin such exposures, because they may be reluctant or have far too difficult a time going to buy a copy of *Parenting*, *Cosmopolitan*, or *Playboy*. A prudent practitioner who does any amount of imaginal exposure work will quickly begin to assemble a collection of exposure materials, among which might be all sorts of pictures and videos. For instance, combat veterans and needle phobics are both commonly asked to watch the movie *Pearl Harbor* repeatedly, because it contains graphic scenes of combat and troops being inoculated (receiving injections). Following is an example picture (Figure 2.5) of a child partially dressed. To most people the picture is benign, if not cute; however, in the hands of someone who for some reason has anxiety reactions or fear responses around children, it might serve as exemplar material for exposure (Figure 2.6). The picture is just of a normal, everyday child, but he might serve as a trigger for inappropriate and inaccurate reactivity to an anxiety disordered patient such as Christine. When everyday magazines are not able to provide provocative enough pictures, it is often possible to use broadly available books for exposure purposes; specifically, around lesbian obsessions, *The Whole Lesbian Sex Book: A Passionate Guide for All of Us* (Newman, 1999) could be used. Had Christine been male and had comparable male ego-dystonic homosexual obsessions, then *The New Joy of Gay Sex* (Silverstein & Picano, 1992) might have been used instead. In either case, practitioners will have to seek out resources that can serve as props for exposure exercises.

Preparing and writing disaster scripts follow some basic rules and guidelines. The script needs to be in the first person (i.e., "I feel"), present tense, and contain as many senses and perceptions as possible (e.g., sight, sound, smell, taste, tactile) to make the script as real as something not real can be. Whatever the person can write to make it sound like the "story" is happening now, in present time, will make the script most effective (i.e., it will activate the fear-based network connections). Again, as with

FIGURE 2.5 Semi-nude child.

FIGURE 2.6 Imaginal exposure with pictures (mock patient).

creating a loop-tape, patients may have to give it several tries before they are able to produce a "good" script, and this tendency is primarily an artifact of naturally not wanting to think about or describe the content in this fashion.

### Interoceptive Versus Naturalistic

Some patients need specific exposure to feared internal states and experiences, such as a pounding heart, labored breathing, or sweating. Fear of these sorts of experiences is commonplace in panic disorder (PD), whether with or without agoraphobia. Much of panic control treatment (Barlow et al., 1984; Barlow, Craske, Cerny, & Klosko, 1989) uses *interoceptive* exposure, or exposure to internal signals of danger (e.g., rapid heartbeat, tightness in the chest, upset stomach, dizziness). In essence, the patient is exposed to internal states that are feared. Ironically, the internal states feared are the very internal behaviors that are supposed to signal danger; in this respect, this type of fear of internal events has been referred to as "fear of fear" (Otto, Jones, Craske, & Barlow, 1996; Otto, Pollack, & Barlow, 1995) because PD is demonstrative of a condition in which the patient fears the cues signaling fear. They are afraid of feeling afraid. Much of the interoceptive work is done through inducing feelings of fear, or panic, to happen. This can readily be accomplished through various physical exercises. For instance, for patients who fear dizziness (often because of concerns that it means they are going crazy or having a stroke) several common exercises are used, such as spinning around in a chair, or simply standing and spinning. Sometimes spinning one's head with eyes closed also works well, especially if the participant then quickly opens his or her eyes and looks into a bright light. Patients who fear choking or feel as though they cannot breathe are often asked to do what is called "straw breathing." This entails trying (trying being the operative word) to breathe not through straws, but through coffee stir sticks. Most people are able to breathe through a regular straw (e.g., a straw from a restaurant), especially if they slow their breathing down and focus. Breathing through a stir stick is much more difficult, and more readily induces feelings of choking or being unable to get a breath. This, as uncomfortable as it might sound, is the point and purpose of interoceptive exposure; that is, feelings of panic are *not* dangerous, but may feel somewhat uncomfortable at worst and will not last. Neither do feelings of panic signal that a person is dying, going crazy, or having some sort of medical problem (e.g., many people believe they are having a heart attack or a stroke, and often end up going to the emergency room only to be told there is nothing wrong with them). As the *Diagnostic*

FIGURE 2.7 Interoceptive exposure (mock patient).

*and Statistical Manual of Mental Disorders*, 4th edition, text revision (American Psychiatric Association, 2000), points out, panic attacks are common occurrences. Although many people have panic attacks throughout their life, some go on to develop panic disorder. It is important to point out that panic attacks are not diagnosable events by themselves, but instead they are the building blocks for other disorders, including PD. Panic attacks also co-occur with a range of anxiety disorder, so it is the prudent practitioner who will include modules from panic control treatment for anxiety disorders in which panic attacks occur comorbidly (even when failing to meet criteria for PD).

While in PD, for example, the patient really only needs his or her own body to have the instrument of exposure. For many other kinds of common anxiety conditions, patients need *naturalistic* settings to access the instruments of exposure. This might entail searching out places that can produce anxiety and fear (e.g., heights for the height phobic, vast open places for the agoraphobic, and tiny little places for the claustrophobic) naturally. For some patients, the exposure becomes about going to a very specific place or setting. For the PTSD patient, for instance, it might entail returning to the scene of the car crash. It is noteworthy that even when people go to either a specific or a general naturalistic setting, they are bringing with them the instrument required for the exposure: their bodies (e.g., climbing stairs to produce a rapid heartbeat; Figure 2.7).

The human body is still what signals whether something or some setting is threatening or dangerous. If the body does not react, the circumstance is likely not a menace. Sometimes the panic-disordered patient experiences panic attacks in natural settings, which may lead him or her to becoming agoraphobic, or avoidant of going out. Agoraphobic avoidance can be both for open and closed (small) spaces. Such avoidance may make it difficult for such patients to actually come to practitioners' offices, so traveling to natural settings may be a requirement if treatment is to be provided. On the other hand, many agoraphobic patients may be very well able to come to a practitioner's office, and that practitioner may not have time to venture out to natural settings. In such circumstances, relying further on imaginal exposure can provide a bridge between in-office and naturalistic exposure. Practitioners may indeed use various pictures to supplement imaginal exposure (Figures 2.8, 2.9, and 2.10).

## Therapist-Directed and Partner-Assisted Versus Self-Directed

Exposure can be carried out with a variety of people present. Obviously the prime player (patient) is required, but after that the selection of people playing both directing and supporting roles can vary broadly. Who is present is also often a factor of where the patient is in the treatment process. In the beginning stages, the practitioner providing the treatment will likely be present for multiple reasons. First and foremost, in the beginning, it will be important that the practitioner demonstrates (models) each of the exposures before the patient performs them. That way, patients can know precisely what they are supposed to do, because they can observe firsthand how to perform the actions of the exposure exercise. This ensures the patient has a clear picture of how to correctly perform the activity, but modeling the exercise also provides information about what not to do. That is, many people with anxiety tend to engage in safety behaviors when they are anxious; such behaviors impair and sometimes even prevent habituation, so knowing what not to do is at least as valuable as knowing what to do. Second, in the beginning, it is important that the practitioner praise patients for work well done and provide encouragement and support to keep going through the exercise when thoughts about stopping too early might creep in. This is common in exposure exercises, in that some patients may want to stop because of the discomfort and the fear. Nonetheless, doing so is contraindicated until habituation is accomplished. With the practitioner present, patients are more likely to continue to go through the exercise and to not stop it prematurely. Left alone, especially if the exercise is at all too challenging for patients' developing capacities, they might quit.

FIGURE 2.8 Agoraphobic imaginal exposure picture 1.

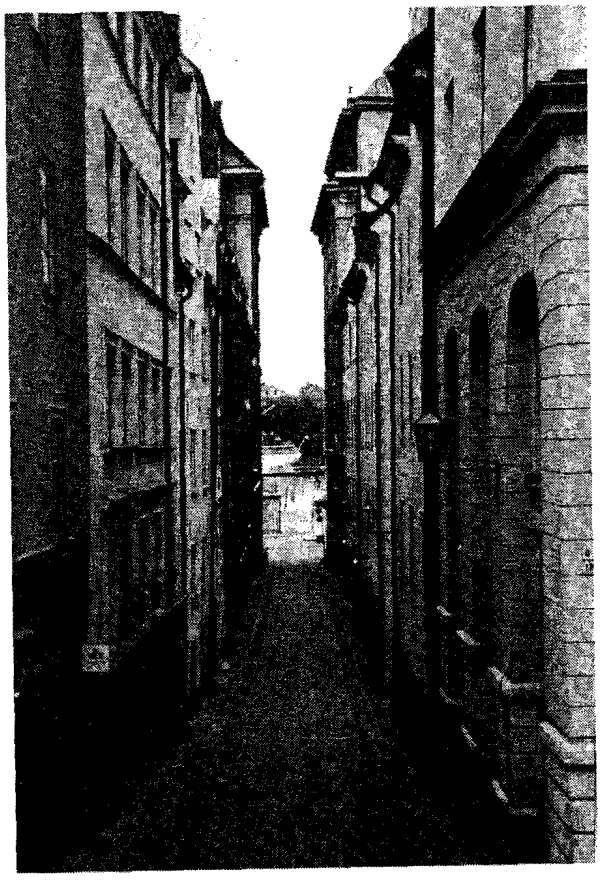

FIGURE 2.9 Agoraphobic imaginal exposure picture 2.

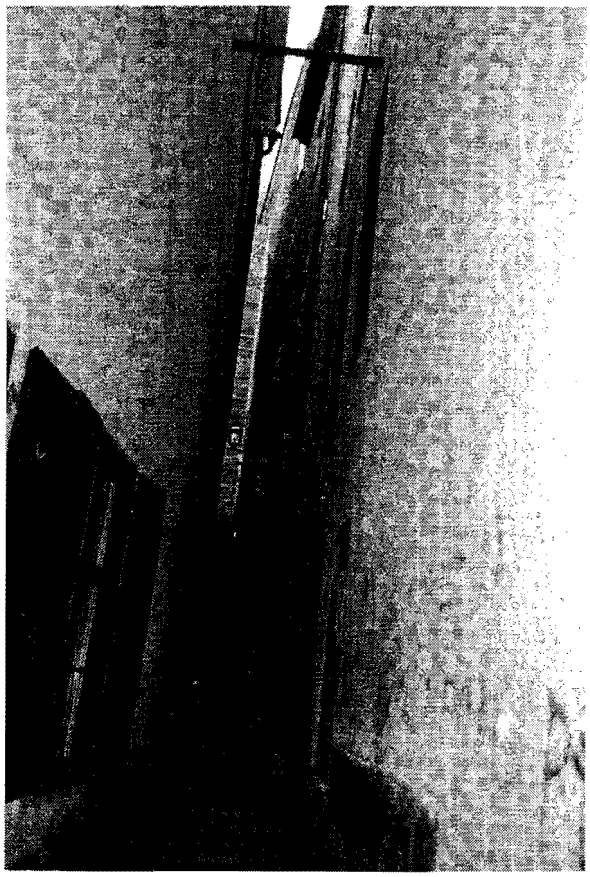

FIGURE 2.10 Agoraphobic imaginal exposure picture 3.

Because it is unlikely the practitioner will be able to spend large amounts of time with the patient in all of the exercises necessary to completely conquer a fear (or multiple fears), it is often very helpful to enlist the support and assistance of "significant others." Exposure work conducted with the help of a significant other is often referred to as *partner-assisted* exposure. In such an arrangement, someone else other than the practitioner is the support person for the patient doing the exposure work. Typically, that person might be a spouse, partner, friend, or colleague. Regardless of who the person is, it must be someone who the patient feels somewhat comfortable with and who the patient, more importantly, trusts. Exposure work is sometimes difficult, and the last experience a hardworking patient needs is someone ridiculing him or her for not being able to do what to others seem rather benign activities. What the patient needs is effective and supportive support and encouragement, so such requirements might limit who could be a "partner." It will be important, with the permission of the patient of course, to orient and minimally train the significant other, because he or she may do some common things that are countertherapeutic. For instance, when someone is anxious and nervous, it is common human practice to assure him or

her that everything will be all right and that nothing is wrong. In fact, for the purposes of what needs to happen in exposure, this would be the wrong approach to take, because the patient needs to experience complete vulnerability in the face of fear. Reassurance that the patient will be fine and there is nothing dangerous around might eliminate vulnerability and consequently interfere with the patient's ability to habituate naturally. Without normal habituation, there cannot be any extinction; therefore, it becomes important to sufficiently prepare a partner to be effective. For patients who are disabled to the point that they are house-bound and living with family, it is often helpful to direct the other family members as to how to best interact with the patients and to not unduly upset them, but also to not facilitate the continuation and maintenance of symptoms. Participation in patient symptoms by other family members is often referred to as "family accommodation," and is something that frequently occurs across anxiety disorders. It occurs for predictable reasons; that is, when a person is anxious, worried, and distressed, often so is the rest of the family. So, often times, the family members will do certain things to put sufferers more at ease. Although this is typically well-meaning, or perhaps done out of desperation (because the anxious patients might become hostile and angry when others around them do not accommodate their concerns), what people tend to do to appease sufferers usually falls along the lines of two basic modes of behaviors: escape and avoidance. The other people, although often well-meaning, will allow patients to do something for them that falls into either category. So, for example, family members who live with someone socially anxious go out to get the mail from the mailbox (where public scrutiny would be possible), and they do not throw parties for friends and acquaintances because they know that the sufferer becomes uncomfortable, awkward, and perhaps even irritable in the presence of groups of people, sometimes even those the person knows already. This problem of family (symptom) accommodation has to be addressed to be assured that the assistance that such an arrangement would provide will not work out to be counterproductive and countertherapeutic. Additionally, it would be important to assess the relationship quality between the patient and the proposed partner; if the partner is less emotionally tied to the patient and his or her symptoms (i.e., is able to remain objective and not emotionally charged or drained by the experience), he or she will be more effective. There is some literature that suggests that certain types of relationships should be avoided when selecting an exposure partner, namely that the support person cannot have a hostile or otherwise negative relationship. In this sense, it is usually easier to pick a nonfamily member for an exposure partner. Ultimately, how effective of a partner the person will be will determine whether he or she would make a suitable, therapeutically advantageous

addition. A specific advantage that such a person could add to the treatment package is that this person (provided the circumstances are right) can often go to places where either the practitioner cannot go or might be ethically questionable (e.g., a spouse can accompany the patient into bathrooms).

In the end, *self-directed* exposure will play a significant role in combating personal anxiety and fear. If the patient cannot perform the exposure tasks independently, the basic ethical principles of autonomy are at risk. Part of the overarching objective in exposure treatments is to provide the patient with increased personal choice, or autonomy, to again be able to independently perform chores of daily living (e.g., driving). If the patient never progresses from accompanied exposures to independent exposures, the risk is that the association for success is the treatment provider. This goes against the ethical guidelines of supporting and facilitating personal freedom. How self-directed treatment is best encouraged and supported is, fortunately, rather straightforward. Initial exposures, regardless of level of complexity and challenge, should be modeled and accompanied by the practitioner. After there is movement up a fear hierarchy, the next move toward fostering independence is to start the patient on performing exposures they have accomplished when accompanied. That is, they begin performing the exposure exercises that they have completed and succeeded at with other support. It will remain important to continue to direct and guide new exposures, because doing so ensures greater likelihood of successfully completing the novel tasks and safeguarding correctly performing those new tasks. Additionally, there are overarching strategies contained within cognitive-behavioral therapy (CBT) that safeguards autonomy and independence, such as focusing formal parts of the treatment on activities that teach the patient to become his or her own therapist. After all, they know themselves better than anyone else, including their therapist. In this respect, CBT often portrays itself as a "coach" or guide and makes it in other ways very clear that the patient is as much, if not more, a collaborative part in the treatment. In this way, treatment is seen as a team activity, within which the patient plays a central and guiding role. The patient's task is to learn how to become his or her own best therapist or best attorney; the practitioner serves mostly a supporting role, much like a computer technician might come to a client to load new software onto the patient's computer (only the person *is* the computer). After the sharing of software is complete, the patient no longer needs the service provider. In this same sense, CBT is oftentimes split roughly into thirds. In the first third of the treatment package, the treatment provider is acting very much in the role of therapist or expert who has the latest new software updates to provide. In this respect, the first third of treatment is spent downloading a lot of information (e.g., psychoeducation,

basic problem solving) to get the patient ready to be able to collaborate more equally with the therapist, who in the middle third of the treatment shifts roles slightly from expert to equal collaborator. Also during the middle stage of treatment, much of the heavy therapy work is performed. Here the patient is still supported more directly by the therapist, but the patient begins to play an equal partner in the treatment; however, he or she has yet to fully become his or her own therapist or expert at how to solve problems. In the last third of treatment, the treatment provider is shifting out of the role of therapist, and really ceases to provide those kinds of directive services and shifts instead into the role of supervisor. Here, the patient shifts roles from being equal collaborator toward budding expert, in which he or she takes on the role of being therapist. In this stage, the patient takes on the responsibility of designing and implementing exposures and other treatment tasks, much like a "true" therapist might. In interactions with their "former therapist" (who has become the supervisor instead), patients then act as supervisee, where they bring information about how the treatment is going and what they are projecting forward as future treatment targets and tasks.

## Hierarchical Versus Flooding

Whether exposure is to be conducted on a graduated, systematically hierarchical manner or faced in the more wholesale, perhaps bordering on brutal fashion of flooding, it is to be collaboratively decided on by patient and practitioner. It is the job of the practitioner to advise the patient about what is known about the two formats, what prospective benefits and cost might be, and provide any additional information that will be necessary for the patient to ultimately decide which version he or she will choose. The central, ethical importance of choice cannot be underscored enough because the patient will be deciding on treatment routes that, by design, will produce some discomfort. The practitioner will have to be careful to completely explain that more discomfort does *not* necessarily lead to increased gains, but that a willingness to endure more challenging exposures may very well lead to similar results more quickly. Larger gains do *not* come from larger pain. The debate should instead really be more focused on how quickly the patient would like to improve functioning and how much personal distress (within limits) he or she is willing to experience. Exposure treatment does *not* have to be intolerable; in fact, best therapeutic effect is contradicted by exorbitant arousal, because the body will, reflexively, begin a shut down (dissociation) program to protect itself. Such a mode during exposure will prevent habituation, thereby preventing extinction. If between-session habituation is not apparent, then

it could be an indicator that the exposure exercises being conducted are too hard and are leading to a lack of integration of pivotal information. This, in turn, leads to the patient having similar difficulties in subsequent exposures; that is, because he or she has not habituated to the stimulus, he or she cannot experience it as any (significantly) less distressing.

Flooding is based on Stampfl and Levis's (1967) implosion therapy, in which patients were instructed to imagine, for long periods, horrific and utterly terrifying scenes related to their fears. The objective of flooding, then, is to have the patient become as anxious as possible. The implosion/flooding sessions were conducted in this manner until the patient's distress and arousal declined. To their credit, Stampfl and Levis operated from the principle of extinction (the key ingredient to genuine relief!) when proposing that classically conditioned fears would extinguish when the stimuli were continuously present (i.e., when escape and avoidance was prevented). The key to flooding, as with any type of exposure, remained the duration of the exposure; too short of an exposure would not extinguish fears, because habituation would not occur, and would instead more than likely increase fears because of what escape teaches people. Although therapists at the time first believed that exposure needed to be as intense as possible, it was quickly realized that the key ingredient was not necessarily the intensity but instead consistent habituation (Hafner & Marks, 1976). Leitenburg and Callahan (1973) found that gradual exposure was more effective than the flooding method.

All of the benefits and costs of flooding should be carefully weighed before starting such a program, and if the patient chooses to proceed, he or she needs to very clearly understand that the work might seem intolerably hard at times. If the patient still wishes to proceed, it would also be centrally important to make sure he or she knows and appreciates that starting such an approach and then finding it simply too hard still leaves alternative routes as an option. Because they start flooding, it does not preclude shifting and changing to graduated exposure later. Again, this would also support the notion of personal autonomy to make independent decisions. No matter which version the patient chooses, the critical within-session experience is that escape and avoidance need to be prevented or completely blocked, because doing so, theoretically at least (if not practically also), directly influences the key variables of frequency, duration, severity, and latency.

## Single-Session Treatment

Lars-Göran Öst (1989b) developed an extremely rapid exposure treatment approach he termed single-session or one-session treatment for

specific phobias. Although this at first might seem an ambitious task, to treat phobias in only a single session, it should be noted that the single sessions used for this treatment are longer than a usual exposure session. Öst's single session typically could run as long as 3 hours, with an emphasis on bringing anxiety and arousal in the presence of the feared stimulus as low as it could get in the allotted time. Additionally, it should be noted that the phobia treated with this approach typically would be a specific phobia, and as such would be a relatively circumscribed or limited phobia (e.g., fear of spiders). If the fear is more pervasive and not isolated to some single, specific fear, this approach might not be sufficient to completely extinguish reactivity and fear. The actual treatment session is also preceded by an interview session, in which a functional analysis is performed and pertinent information about the fear is gathered, a rationale is provided, and information for what will happen during the prolonged exposure is given (e.g., how the person will face the feared stimulus, how SUDS ratings will be assessed).

For maximum impact and effectiveness, the Öst one-session exposure treatment is an in vivo exposure and it does not end until at least a half-reduction is realized. High arousal, unlike flooding, is not necessarily needed, neither is it a goal, so long as no escape or avoidance occurs. The exposure used in this treatment is more like a series of behavioral experiments, in which patients state what they fear will happen if they do certain things. The feared activity is then performed to see if the feared outcome about the specific fear actually occurs. The exposure is always preceded by therapist modeling of correct, desired actions.

This type of exposure is considered a massed exposure, in that multiple exposures with the stimulus are performed. So, for example, a blood phobic might get finger-pricked several times, have several subcutaneous injections, and a few venipunctures all during the one session (Öst, 1997). Its use is primarily indicated for spiders, snakes, birds, wasps, blood/injection, and other animals (e.g., dogs, cats, horses, cows) and insects, but it has also been used, more interestingly, with claustrophobia and fear of flying (Öst, Brandberg, & Alm, 1997).

## Artificial Settings, the Natural Environment, and Ecological Relevance

Even with the wealth of literature that is available supporting the positive impact of exposure therapy, this kind of treatment is not without its troubles. Indeed, some patients are not responding favorably to exposure, with up to 30% of patients, for example, appearing refractory to exposure and response prevention (ERP) treatment for OCD, and dropout rates (i.e., premature, early termination) average around 20%

(Baer & Minichiello, 1998; Foa, Abramowitz, Franklin, & Kozak, 1999; Koran, 1999; Kozak, Liebowitz, & Foa, 2000). Taken together, these phenomena combined could appear to suggest that up to 50% of patients who attempt this now standard approach for treating OCD are not adequately helped by traditionally delivered ERP (McLean et al., 2001; Salkovskis, Richards, & Forrester, 2000).

Despite these seemingly negative findings about OCD, there is significant and meaningful hope for refractory, severe, and chronic patients. In fact, preliminary data suggest that delivering a standardized CBT product, focused on in vivo ERP components, as a home-based intervention, may be modified enough for a positive treatment response to occur in many refractory and challenging patients (Rosqvist et al., 2001; Rosqvist, Sundsmo, MacLane, Cullen, & Cartinella, in press; Rosqvist, Thomas, & Egan, 2002; Rosqvist, Thomas, Egan, & Haney, 2002; Willis, Rosqvist, Egan, & Baney, 1998).

Although ERP was originally designed to be applied in a hospital setting, the treatment can be administered in the patient's natural environment in a more cost-effective manner and in a fashion that results in superior maintenance of treatment-produced change (Emmelkamp, 1982; Emmelkamp, Kloek, & Blaauw, 1992). In more recent years, health care, including psychotherapy, has seen an increasing trend toward clinical care that is both less restrictive and more cost-effective (Levendusky, Willis, & Ghinassi, 1994; Mesh & Loeb, 2002; Willis, 1994). Rosqvist et al. (2001) investigated delivering ERP exclusively in natural settings with a group of 11 refractory patients through a home-based delivery system. Their findings suggested that approximately half of the patients treated in the presence of genuine (not analog) cues improved significantly. For others, it additionally served to facilitate transition into an OCD day-treatment program, which had been previously impossible because of significant OCD symptoms. They concluded that home-based ERP is an alternate product that should perhaps be offered to patients who have, for various reasons, failed to benefit in more conventional settings. Understanding nontraditional or natural settings remains challenging.

Much research on the treatment of OCD has focused on traditional delivery settings (i.e., hospital settings, whether inpatient or outpatient; e.g., Baer, 1993; Calvocoressi et al., 1993; Drummond, 1993; van den Hout, Emmelkamp, Kraaykamp, & Griez, 1988; Hoogduin & Hoogduin, 1984; Pollard, 2000). Limited research has investigated treating OCD away from outpatient and inpatient treatment facilities (e.g., Boersma, den Hengst, Dekker, & Emmelkamp, 1976; Emmelkamp, van Linden-van den Heuvell, Rüphan, & Sanderman, 1988; Emmelkamp, van Linden-van den Heuvell, Rüphan, & Sanderman, 1989). Research available on exposure treatment in naturalistic settings (i.e., *not* analog

settings) suggests that nontraditional delivery of exposure to challenging OCD patients may be, at least in part, responsible for meaningful change. Notably, such results were attained by relying on established methods of habituation and extinction, only altering where the delivery takes place. This seems to suggest that natural settings appear capable of reducing problems with generalizing gains that some patients appear to experience when leaving traditional treatment settings (e.g., Emmelkamp et al., 1989; Steketee, 1993).

The implications of using natural settings as delivery vehicles for exposure treatments become even more interesting and compelling if treatment-refractory patients demonstrate positive findings, because they may otherwise continue to represent a greater utilization risk or burden, leaving practitioners unsure of what to do for them (Rosqvist et al., 2002).

*Ecological relevance* may indeed play an important role in how the aforementioned, and other anxiety-disordered patients, obtain meaningful change. Specifically, ecological relevance refers to the setting or location in which the treatment is delivered. A common concern of practitioners is the disappearance of improved behavior and reduced fear when the patient returns to his or her natural environment, which, for obvious reasons, may be an exacerbated problem for the inpatient treatment of OCD and other severe anxiety disorders. In analog residential settings, the patient is completely removed from natural settings in which he or she will eventually have to function. This can potentially create substantial problems with at least transportability (i.e., capacity to bring any gains home), if not generalizability (i.e., applicability of any gains to a different setting than that which the gains were made in).

Practitioners have not harnessed the enormous influence of the natural environment toward therapeutically congruent ends; instead, early observations have been made that the natural environment has often actually been established as the enemy of therapeutic intervention (Tharp & Wetzel, 1969). This tragic stance remains largely in effect today, at least in North America. Although it is recognized, and sometimes even acknowledged, that significant potential for behavioral change lies in the natural environment, researchers and practitioners outside Europe and Scandinavia have largely failed to use such settings routinely as a *primary* delivery site, opting instead to rely on outpatient care and higher stepped, more restrictive (analog) care settings. In North America, this is influenced by a pervasively restrictive insurance industry, which dictates where and how services can be delivered and by whom. Consequently, this translates to most patients receiving exposure treatments in traditional settings, no matter how compelling indications for use of natural settings might be. When a patient does not respond on the

least restrictive level commonly used, the outpatient clinic, the strategy employed sometimes follows an increase in stepped-care level, which can lead to an inpatient or residential treatment approach. This de facto standard practice is often used instead of considering delivery in natural settings, which (not unimportantly) represent a significantly more cost-effective treatment option when compared with more restrictive hospital settings. Indeed, even self-treatment of anxiety can in some instances be effective (Fritzler, Hecker, & Losee, 1997). However, in a few cases, when a patient has "failed" both conventional outpatient trials and inpatient programs, the treatment suggested could progress to the most restrictive, invasive level of psychosurgery, even though efficacy of psychosurgery for refractory anxiety has not been clearly established (Jenike, 2000). When such dramatic and potentially costly (i.e., both financially and health risk-wise) steps have been taken, careful attention to whether or not naturally occurring environments might have made a difference often have not been carefully considered. In fact, psychotherapy practice tradition has all but ignored natural settings, even when it is clear that discrepancies exist between analog settings and the waiting community needs.

Nonetheless, in spite of tradition, one field in psychology that frequently conducts therapeutic interventions in the natural environment is the field of applied behavioral analysis. In this field, practitioners conduct single-subject research and provide treatment for a variety of patients who exhibit an array of behavioral problems, including anxiety disorders. The research and treatments they conduct take place in many settings, but extensively rely on natural settings in which symptomatic behavior occurs. To ensure that a problem behavior can be successfully treated, an applied behavioral analysis practitioner conducts therapy in the same historical and environmental context in which the patient displays the problem behavior. This ensures that the environmental cues encountered are the natural cues that naturally trigger anxiety and not a re-creation of the cue in some faraway, analog clinic setting that is little like the setting to which the patient later has to return. In addition to providing direct, meaningful therapy in such settings, the practitioner also often conducts training of significant others to ensure that the interventions are supported and continued, even after the practitioner is no longer in the environment. This approach and system aspires to the highest ethical guidelines of promoting self-efficacy and independence. In this fashion, by relying on ecological relevance and the monumental power contained in natural settings, the practitioner is better able to ensure generalizability and perhaps even enhanced effectiveness of the interventions.

The U.S. Environmental Protection Agency, in its Ecological Risk Management Training, defines ecological relevance as "one of the three criteria

for assessment endpoint selection," and further points out that "ecologically relevant endpoints reflect important characteristics of the system and are functionally related to other endpoints" (U.S. Environmental Protection Agency [n.d.] retrieved April 10, 2005, from http://www.erg.com/portfolio/elearn/ecorisk/html/resource/glossary.html). Although this definition comes from outside the field of psychology, the definition and subsequent observations still hold. In clinical psychology, this definition means ecological relevance is an element in the assessment of treatment intervention selection. Therefore, ecologically relevant interventions reflect characteristics of the environment in which the patient lives and the interventions are functionally related to other aspects (e.g., job, personal life) of the patient's life.

Examples of ecological relevance can sometimes come from research work outside of psychotherapy. In neurocognitive assessment, for example, Makatura, Lam, Leahy, Castillo, and Kalpakjian (1999) evaluated the accuracy of memory impairment classification (none, mild, moderate, and severe) when using an ecologically relevant test (i.e., those that measured memory used in everyday situations, such as memory for routes) and when using theoretically based tests (i.e., those that measure the theoretical construct of memory but are not necessarily tasks performed in daily life). Interestingly, but perhaps not surprisingly, they found that the ecologically relevant test outperformed the theoretically based tests and hypothesized that this measure may take into account those compensatory mechanisms that patients use in their environment. Consequently, this test "can aid in making hypotheses about the types of problems an individual may encounter at home, work, and the community" (Makatura et al., p. 65).

This memory example highlights the importance of ecological relevance in assessment, and as such is arguably of central importance in psychotherapy, too, because treatment interventions should logically flow from what assessment suggests would be helpful. Although the theoretically based tests may have been technically more sensitive, being able to pinpoint the exact point at which the memory fails, the ecologically valid test was able to evaluate what the impairment actually meant in the patient's day-to-day functioning. Knowledge for knowledge's sake may be interesting to the practitioner, but does it really help the patient? Bringing this example back to the therapeutic setting, teaching a patient the skills needed to become more effective in the environment within an office, or analog, setting may give the client some knowledge and insight into the condition, but will it really transfer into action in "real" settings? Some patients can make this leap, but not all. For those who find this difficult, an ecologically relevant treatment approach will ensure that the common problems of generalizability and transportability are directly addressed.