

Behavioral Approaches and Neuroscience

DaNeta

DaNeta¹ is a 53-year-old female seeking treatment in an outpatient setting for symptoms related to her diagnosis of bipolar disorder. DaNeta is primarily concerned about her outbursts directed primarily at her husband, with whom she has been in a relationship for 22 years. She describes lashing out verbally, saying things in anger that she hardly even dares to think when she's calm. Typically, she escalates further into throwing objects, and on several occasions, when feeling threatened by attempts by her husband to restrain her, she has become violent toward him, scratching, clawing, and hitting/kicking. She describes feeling remorse after "coming down" from the manic episodes, often so low that she sinks into a depressive episode for up to two or three weeks. During this downswing, she stays in bed or at least in her room, emerging only to pick at her meals and to use the restroom. This most recent swing in mood and behavior resulted in her typical suicidal ideation, but continued into an overdose of sleeping medication. She was hospitalized for four days, then discharged into intensive outpatient treatment for two-and-a-half weeks. She reports that while she learned a lot of coping skills and gained some insight into triggers for both her anger and her depression, she wants more from her life.

Opening Questions

- What do you *do* in the presence of stress, negative events, or unpleasant emotions? What do your clients do?
- Is it more realistic for people to expect to feel their way to better behavior or behave their way to better feeling?²
- How does what people do reveal what they actually want, despite any words they may use to the contrary?

Chapter Goals

- To trace the evolution of behavioral approaches through the past century, while also tracking the points of integration with neuroscience
- To juxtapose two foundational neuroscience principles that advance our understanding of the difficulty in changing behavior, as well as the hope for change
- To explore the roles of language and attention in changing and managing behavior

BEHAVIOR MATTERS

If you take nothing else from this chapter, or book for that matter, please keep this one truth in mind: *behavior matters!* (Luke & Redekop, 2014). It's easy to be deceived by a client's words, not because clients are necessarily intentionally deceptive, but because verbal language is an oft-unreliable mode of communication. Behavior, on the other hand, can be difficult to conceal from others or our self. Consider the theoretical framework presented in Chapter 1. Look again at the relationship between thinking, feeling, and behavior. When leading therapy groups, like many of you, I pay close attention to behavior in the group, because behaviors are often far better indicators of what is happening with group members.

Which would you guess is most easily and directly measured? We can certainly measure clients' reports of their thoughts and feelings, but those are difficult to observe directly. We can observe indicators related to thoughts or feelings, but only behaviors can be directly observed. This does not *really* imply that behaviors are paramount to thoughts and feelings; they serve a very different purpose in therapy and should therefore not be conflated with one another or viewed as interchangeable.

One of the most significant findings in neuroscience is actually not that new, but the ramifications continue to unfold today. Let's return to DaNeta for a moment.

Behavior in Session: DaNeta

Immediately, after beginning to build rapport, the therapist is interested in, and focuses in on, the problematic behaviors rather than the diagnosis itself. She queries DaNeta regarding the specific behaviors that may (1) indicate such a diagnosis and (2) be causing problems for her.

- *What questions might a neuro-aware, third-wave behavioral therapist address? How would this therapist proceed?*
- *What are the antecedents and consequents of DaNeta's behaviors?*
- *In terms of antecedents, what happens in her environment right before her mood elevates and her behavior escalates?*
- *As far as consequents, what happens in her environment immediately following her behavioral extremes, both the outbursts and the depressive withdrawal?*

Table 4.1 provides a summary of the salient features related to contemporary cognitive-behavioral approaches, especially the so-called third-wave behavioral approaches, which include mindful awareness. It also connects these concepts to a neural correlate or phenomenon that can be implemented by therapists in treatment.

BEHAVIORISM AND HEBB

From a humanistic perspective, therapists work to separate their clients' behaviors from the person of the client, but that is for the next chapter. From a neurological perspective, we are what we repeatedly do. Practically and neurologically speaking, *behavior is meaningful*, and neuroscience substantiates this claim. In the late 1940s and early 1950s, a neuroscientist by the name of Donald Hebb (Figure 4.1) was the first to describe a phenomenon in neural communication wherein firing patterns of neural networks increase the likelihood of subsequent firing of those same networks (Hebb, 1949). In other words, neurons that fire together wire together; neurons that fire apart wire apart. This simple

Table 4.1 Behavioral Concept Map

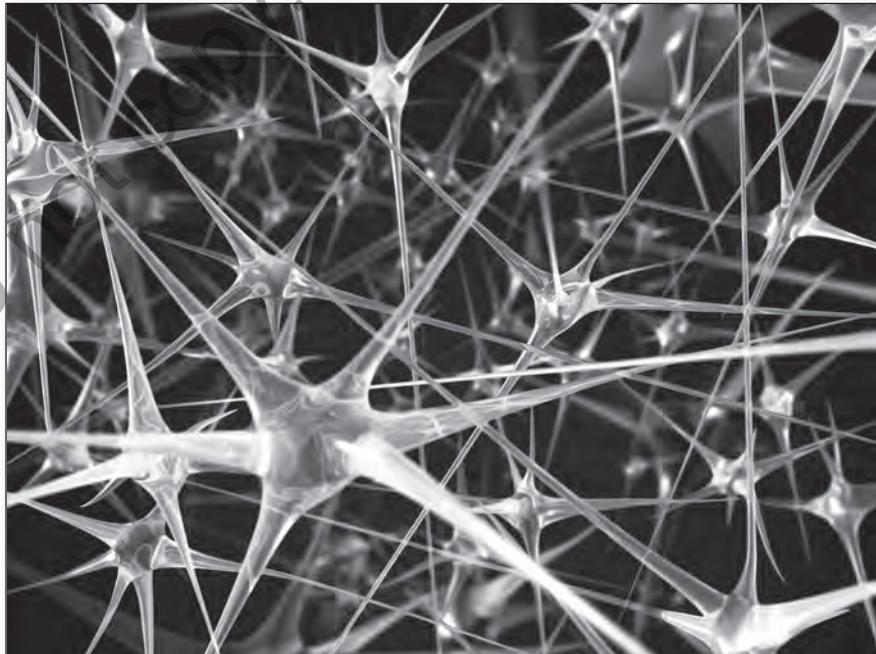
Neuro Concept	Behavioral Component	Therapeutic Value
Hebb's Rule —"Neurons that fire together wire together"	Classical Conditioning — Learning (paired condition and stimulus) entrenched behaviors that can be self-defeating and resistant to change	Explains how we get stuck in maladaptive behavioral patterns
Neuroplasticity — Biochemical changes in the brain in response to learning	Operant Conditioning and Social Cognitive Therapy — Learning and relearning new ways to behave by managing antecedents and consequents	Change is possible—at the neurological level!
Left- and Right-Brain Processing —Logic (rationality) versus creativity (emotion)	Rational Emotive Behavior Therapy —What informs your decision making?	Emotions are real, but they do not necessarily represent reality
Language and Attention in the Brain —Movement of memory and awareness from implicit to explicit	Mindfulness and Acceptance — Being aware of uncomfortable affective experiences without trying to change them	Behavior must be brought into awareness before it is able to be consciously changed (a shift from radical behaviorism)
	Reality Therapy's WDEP — Wants, doing, evaluation, and planning	How does what you are <i>doing</i> reveal what you actually want?

Figure 4.1 Donald Hebb

Source: Photo used by permission of the Canadian Medical Hall of Fame.

phrase came to be known as Hebb's law or Hebb's rule (introduced in Chapter 2). These patterns of repeating neuronal firing create neural networks, systems of firing among many thousands of neurons to create action potentials leading to certain behaviors (Figure 4.2).

Recall the clay analogy in working with Sandrine in Chapter 2. Hebb's rule means that the neuronal networks that fire in response to certain thought or behavior patterns strengthen in proportion to the amount of repetition or rehearsal they receive. Two principles are at work in this. The brain is the epitome of efficiency, pruning away networks and synapses that remain unused (the amount of idleness that results in pruning has not yet been determined conclusively). The brain is therefore responding to behavioral and environmental cues by shaping its structure and function to be more efficient. The result is the brain's ability to move routine processes into the background, which makes certain tasks easier to navigate. The downside comes when we try to change our behaviors or thought processes that have become neurologically entrenched.

Figure 4.2 Neuronal Networks

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Later, we'll address the hope for changing these things from a neural perspective, but first, let's look a little closer at the connection between Hebb's rule and behaviorism. Luke and Redekop (2014) offer a summary of behavioral approaches in general and the development of behaviorism in particular. I'll highlight several points here.

Classical Conditioning

Classical conditioning, the pairing of stimulus and response, is really foundational to behaviorism, at least in the classical sense. Ivan Pavlov was the first to demonstrate the power of pairing a stimulus to a response in a variety of animals. In fact, for Pavlov, learning, and all behavioral responses for that matter, is essentially a chain of conditioned reflexes (Pavlov, 1927). In humans, this works by training our behaviors through stimuli, or antecedents, the environmental cues to which responses are paired. Each time the stimulus is paired with this same response, neural networks are strengthened, increasing the likelihood that the pairing will occur in the same way again. This is neither a conscious nor an unconscious process, as behaviorists, especially the early ones, would not acknowledge the existence of consciousness either way, nor would they recognize a mind as we currently conceive of it. It was only later when George Kelly (1955) (perhaps the first contemporary cognitive psychologist), Alfred Adler (though often most identified with psychodynamic models), Albert Ellis (REBT, discussed below), Aaron Beck (cognitive therapy), and other cognitive and cognitive-behaviorally oriented theorists introduced the concept of conscious thought into the equation that the behavioral approaches began to move beyond the perception of reflex-only behavior.

Classical conditioning corresponds with Hebb's rule, in that Hebb's rule aids in understanding how repeated exposure to a stimulus and paired response creates these "reflexes" at the cellular level (neurons). Recall that we're not talking here about one neuron firing with another to create a response. It can take as many as 10,000 neurons firing synchronously to generate an action potential—the electrical impulse traveling down the axon to stimulate the release of neurotransmitters (Schwartz & Begley, 2002). So when we are talking about entrenched behaviors at the neurological level, we're talking about profligate networks of neurons working together to create movement—both literally and figuratively. Because many of the pairings of stimulus and response occur outside of awareness, they can continue on unchecked for quite some time, creating metaphorical ruts in the brain. This makes us more efficient "behavers" in that these processes, as mentioned earlier, can operate in the background, without conscious cognitive input, or even assent. As discussed in greater detail in Chapter 10 on treating substance use disorders, clients' relationships with their drug of choice represent these background processes. For example, when in their right mind (colloquially, not literally neurologically), they are aware of the impact of these on their life and functioning; but when distracted, they are far more prone to make a move for the substance without really thinking about it beyond the precontemplative "I want." If the "using behavior" were vital to their survival (which they can argue at certain times), having the automated, background reflex would serve an adaptive purpose. As it is, in those moments when clients are honest, these behaviors are not, in fact, essential for survival. And yet, the "reflex" has become automated, or at least the impulse has, based on repeated pairings that have occurred in their brain.

Classical Conditioning in Session: DaNeta Continued

During the clinical interview, the therapist asks DaNeta about the precursors of her most recent outburst. This is somewhat fresh on her mind because she has been working on "triggers," those cues that seem to result in negative behaviors. Many treatment interventions focus on "coping" with triggers, but the mindful, neuro-aware therapist is attuned to DaNeta's affect, words, and body language as she discusses these triggers and coping skills. Therefore, she notes that the trigger at work here is more of a buildup over time related to the quality of her relationship and interactions with her husband. Essentially, DaNeta discloses, "My husband does not listen to me and certainly does not understand me." This leads to her feelings of "isolation," "loneliness," and "emptiness." The behavioral therapist is far less interested in those feelings, per se, though they are important to us because they are important to the client. Our focus, however, will be on the behavior DaNeta uses to avoid feeling isolated, lonely, and/or empty—what does she do? "Nothing" is the almost immediate reply.

As will become increasingly apparent throughout the review here, this is DaNeta's—and many clients'—go-to response. At times, clients will believe this is the truth, as their brains have been restructured around these responses, such that they become automatic. Recall that the brain is the picture of efficiency, pruning away synapses that remain unused for some time and strengthening those that are used frequently (Hebb's rule).

This response is assumed to be limited, and the client will be challenged. However, from a neuro- and cognitive-didactic perspective as in a behavioral approach, DaNeta's therapist will give her feedback about the nature of her response and how it has become automatic for her. The therapist then invites her to try again.³ As the exchange continues, it becomes clear that DaNeta does in fact do something. She stuffs her words inside, swallows her emotion, and begins repeating the following self-statements: "It's not worth fighting about"; "He'll never change"; "I can't get my needs met." This leads to a more core belief that "I am not worthy of his—or anyone's—love." Far from being "nothing," this process is like loading a canon with gunpowder, packing in the combustible material until the fuse is lit. Throughout years of this process, DaNeta's brain has begun to associate her body's autonomic response to these almost-conflicts as a sign to withdraw (flee) rather than approach her husband to try to express her needs. She has taught her brain that when she feels angry with him, she must not talk about it because there is too much (perceived) risk. Each encounter "loads the canon." The result is that, in moments of fatigue, emotional exhaustion, or exposure of a raw "nerve," she acts out in a rage that, in the moment, appears impulsive, reactive, and manic. In actuality, this has been building over weeks and incidents where her needs are repressed by her self-defeating self-talk and perception that things are hopeless. The neural networks related to this relationship, communication patterns, and her denial have been refined to work efficiently, where other problem-solving networks have been pruned away so that DaNeta can operate out of the midbrain more efficiently.

Operant Conditioning

Taken alone, Hebb's rule can feel deterministic and a little hopeless. However, neuroscience also offers a rejoinder. First, Albert Bandura (1986, pp. 18–21) sets the stage for change. He identifies five “capabilities” that distinguish humans in their ability to make choices, which are vital to therapists and to integration of behaviorism with neuroscience (summary from Luke & Redekop, 2014):

- *Symbolizing Capabilities*—In contrast to being consigned to trial-and-error learning as presumed in early behaviorism, humans have the capacity to use language to symbolically represent behavior and environment. Bandura identifies this as playing a key role in altering and adapting to the environment (key in an antideterministic view of behaviorism). Essentially, this symbolizing capacity allows for virtual hypothesis testing regarding the potential outcomes of behaviors based on environmental factors. This is not a foolproof system because humans are also given to irrationality in their conceptualizations of scenarios, basing decisions for action on faulty reasoning, leading to ineffective or damaging behaviors. In essence, therapy can assist clients like DaNeta in visualizing the current process, but then in a more adaptive way as well.
- *Forethought Capabilities*—One of the most powerful and distinguishable characteristics of Bandura's social learning theory (1977), and later his social cognitive theory of learning (1986), is the mediating effect that cognition has, or can have, between behavior and environment. While it is certainly the case that many individuals, and perhaps all individuals from time to time, will behave impulsively, without conscious thought, we are also not completely subject to indiscriminate reactions to the environment. Forethought—a cognitive capacity—allows us to discriminate, selecting among alternatives prior to acting. It is based to a large extent in the symbolizing capability, wherein future actions and their potential outcomes can be projected. DaNeta, for example, is not a mindless reactor to her environment, despite her past behaviors. Cognition, when allowed to, mediates the environment-behavior connection.
- *Vicarious Capabilities*—This is a notion that has really gained traction in modern times through neuroscience findings, and more specifically the mirror neuron system (Ramachandran, 2012). Rather than learning in a vacuum, resulting in learning by trial and error alone, humans are capable of learning from others—so-called observational or vicarious (Bandura, 1977, 1986) learning. This vicarious capability allows humans to “learn by observation [and] acquire rules for generating and regulating behavioral patterns without having to form them gradually by tedious trial and error” (Bandura, 1986, p. 19). This represents a major shift in our long-held view of learning that it can only, or mainly, take place by doing. Bandura asserts that complex learning can only be performed by prior modeling of behavior (huge implications for counselors and counseling). Role-play with DaNeta in session will help reshape her brain to help her change her responses to environmental cues.

- *Self-Regulatory Capabilities*—Again, in contrast to strict operant factors in shaping behavior, self-regulation allows humans to observe their performance behavior in context. This moves them not only to shape their environment based on this, but also to modify their expectations of *their* own performance. This has vast implications for self-efficacy, outcome expectancies, and self-esteem (though Bandura is unlikely to use such a term). Attribution of successful behavior is a cognitive-affective process, determined in part by the environment and personal factors, and most importantly by the individual's thinking regarding his or her interaction (more on this in our discussion of self-efficacy). Many clients enter therapy feeling like hapless, helpless victims of circumstance (environment). Therapy will assist DaNeta in recognizing times and ways she can allow herself to feel empowered, as uncomfortable as that responsibility can feel.
- *Self-Reflective Capabilities*—Here, Bandura introduces the concept of metacognition, even if not using that exact term. Humans have the capacity to think not only about their behavior and environment, but also about their own thinking. This allows for modifications in subsequent thinking, acting, and environment influence, particularly as each pairing of these constructs is mutually reinforcing (reciprocity). This is the point at which self-efficacy lends greatest weight in determining behavior: increased belief in ability to perform a task increases the likelihood that a behavior will be enacted. Whatever she tries in therapy with DaNeta, the therapist will invite her feedback and reflection on what works, what doesn't, and possible reasons for this.

Together, these five capabilities build a bridge for behaviorism to cross into the modern era with a real, authentic respect for thoughts and feelings, behaviors, and environments, without relegating cognition and affect to behaviors. In addition, it sets up uniquely human capacities for change and self-determinism, even while acknowledging limits to “pure” environments and actions.

Operant conditioning, while a somewhat natural extension of classical conditioning, expands the view of trained reflexes by introducing us to the hope for change in neuroscience alluded to earlier. Operant conditioning, advanced significantly through the work and writing of B. F. Skinner (1938, 1974), adds the dimensions of antecedents and consequents to classical conditioning's emphasis on pairing stimuli and responses. What that means practically is that, instead of looking merely at events that come immediately prior to a behavior (antecedents) leading to pairings or reflexes, operant conditioning looks at both antecedents and consequents. In other words, behavior in the moment is reinforced by what comes immediately before and after. Contingencies of reinforcement, Skinner's term, are those circumstances that follow a behavior and increase the likelihood that the behavior will be repeated. So, instead of being a victim of random pairings leading to these behavioral reflexes, we can become aware (historically a cognitive contribution, but now considered part of contemporary behavioral approaches) of these environmental factors that reinforce certain behaviors. Enter the next neuroscience concept of note: neuroplasticity.

Neuroplasticity is the composition of neural networks in the human brain that has evolved to make possible the five capabilities previously discussed, allowing great flexibility in thinking and behaving. This modern concept regarding the brain's ability to change itself has undone a couple of long-standing misconceptions about its malleability. For many decades, the dominant view was that the neurons we are born with are finite and absolute. In essence, from early on, the view contended, our brains are losing neurons that will never be replaced. Currently, however, neuroscience has identified several brain regions in which neurogenesis (growth of new neurons) takes place, most significantly, perhaps, in the hippocampus (Jokić-Begić, 2010), the neurological seat of memory. The implications of this will be discussed in more detail below, but for now, imagine what it could mean for our clients to realize that their behavior can stimulate “memory neurons.”

The second, even more powerful, concept in neuroplasticity is synaptogenesis. Synaptogenesis is the phenomenon that describes how neural networks are able to form new neuronal connections at the synapses. Brain lesion and brain damage research have demonstrated for some time that the brain is capable of forming new neural connections that allow the brain to compensate for loss of function in a damaged region (Jokić-Begić, 2010). This means that the brain can adapt to damage, changing in order to be more effective! Literal as this reality is, it often becomes even more powerful as imagery for change—our clients don't have access to functional magnetic resonance imaging (fMRI) devices, or most don't, so directly observing these changes is challenging to say the least. Instead, therapists can offer examples of behavioral changes that begin to literally reshape the brain's configuration at the neural level. A basic example of this from everyday life is going to the grocery store. We tend to frequent the same stores in search of our favorite foods. Over time, we know where to find these items and find ourselves on virtual autopilot in tracking down these goodies. And then the store changes things around! These changes take some getting used to. So how do we do it? We change our behavior, following the new path, in spite of old instincts and impulses, until this new path becomes a habit or pattern. Clients can certainly relate to this. We don't see it directly, but we know that our neural nets are reconfiguring—a system of memory and motor neurons telling us to do something different. Behavioral therapists use these metaphors to evoke change in their clients.

Operant Conditioning in Session: DaNeta Continued

On the back end of this interaction are the consequents. DaNeta has told herself for years now that it is not safe to talk openly and honestly about her feelings toward or with her husband. But what could possibly be the reinforcing consequent that makes the physical and emotional damage worth this behavior, assuming of course that there is a payoff? Behavioral approaches contend that there is always a payoff. It is the job of the therapist to understand it. From a neuro perspective, DaNeta has learned to operate out of her limbic region, wherein she is primarily reactive to her environment,

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behaving either passively or aggressively. Imagine how clients might feel living in a situation in which they believe they are unable to communicate assertively with their partner (or anyone with whom they are in relation, for that matter). DaNeta, upon gentle probes into her day-to-day experience, affirms therapists' continued experience with their clients when she admits that she feels helpless, weak, and disempowered. The therapist observes her body language as she describes this, noting that she is slumped, her voice is softer, and her eyes are downcast. In contrast, as she moves to a description of her "manic episodes," the therapist notes something different. Consistent with the third-wave behavioral approaches, she stops DaNeta midnarrative to ask about her experience in the present moment. She's asking DaNeta to become mindful of her immediate experience, a task that is new for her. After some initial confusion, she describes her heart pounding, fists clinched, and beginning to perspire. When asked what those bodily experiences mean, she describes feeling powerful, strong, almost unstoppable. "Would you describe these experiences as more positive or negative?" DaNeta's immediate response is "positive." She describes how these are the only times where she feels alive and in control (with a tone of irony that in the moment her behavior appears to be out of control). The therapist then asks what she perceives her husband's response to this is. "It's about the only time I feel like I have his attention, even if it's because he's protecting himself from flying objects," she says with a wry smile. At this moment, DaNeta has a flash of awareness: she knows what the payoff is. The therapist knows as well. Despite the negative consequences she experiences (e.g., broken items, hospitalization) why would she give up the only way and times she feels powerful in her own life? At this point of awareness, DaNeta is invited to imagine what it would be like to experience feeling a sense of personal autonomy without the negative side effects. Please note that it is critical that she be reminded not to consider (yet) the feasibility of this imaginal experience. The point is to begin to create new brain pathways that allow her to review her future life possibilities rather than to begin problem-solving the situation.

Social Cognitive Theory

Bandura's (1986) social cognitive theory is a learning theory in the operant conditioning tradition, wherein environmental factors play a key role in reinforcement. It is very important to recognize that behaviorism, whether explicitly acknowledged early on or not, is a learning theory. Therefore, it is important to understand the terms associated with learning. Since learning theory, and particularly Bandura's social learning theory (SLT, 1977), later called social cognitive theory (SCT, 1986), represented a shift in behavioral approaches, we discuss it in this section, in later developments. We'll discuss quite a number of concepts in SCT here, and infer more specific intervention from the theory in a later section. SCT demonstrates that most learning is mediated through cognition and occurs through observation in a social context.

Learning (as in "learned behavior") includes three main types of learning related to behaviorism, according to Bandura (1977): *Associative learning* (classical and operant conditioning) is the process of making an association between two stimuli or a stimulus and a

response. *Nonassociative learning* (habituation and sensitization), in contrast, is a decrease or increase in response to a stimulus based on exposure. *Observational learning* (or vicarious learning) involves learning by observing someone else. This is key in Bandura's theory.

In SCT, it is the observation of another performing a behavior that serves as a model of the behavior, and the results of the observed behavior create vicarious reinforcement. This is significant in at least two ways, the first of which is that environmental contingencies of reinforcement can occur at a distance, through observation. The second is that while our environment serves to reinforce behavior, cognitive processes serve as mediators between the person and the reinforcers. That is, we are not mindless reactors to our environment, or at least we do not have to be.

Imagine such research for therapy from a neuroscience perspective. As discussed in Chapter 3, the interpersonal neurobiological perspective (Siegel, 2006) describes the reciprocal influence on both therapist and client. Badenoch (2008) lays this out more explicitly as the modeling of the therapist for the client of prosocial, adaptive behaviors in session. For example, the therapist can describe emotional regulation to DaNeta until they are both blue in the face, or the therapist can model emotional regulation for her. This modeling is vital for the development of self-efficacy. *Self-efficacy* is a core construct in SCT and is the "conviction" (Bandura, 1977, p. 79) that one can accomplish a given task. As a result of the therapeutic relationship, clients must begin to believe that they are able to exert positive influence over the direction of their life, or at least over particular tasks in their environment. This is clinical self-efficacy, and it is influenced by four sources:

1. ***Enactive attainment*** (mastery experiences) is the most influential source of self-efficacy, wherein success in accomplishing a task raises belief in one's ability to complete that task again. The "catch" is in the attribution (Weiner, 1986). There is an inverse relationship between perceived ability and perceived effort: the more effort exerted in completing a task, the less likely the attribution will be made to competence, and vice versa. In therapy, therapists "catch" clients using new or existing skills. This is a technique related to solution-focused therapy that will be covered in more detail in Chapter 6. Clients often have adaptive capacities that they remain unaware of. Bringing these to awareness creates new pathways in the brain, in the form of learning, in effect counteracting Hebb's rule.
2. ***Vicarious experience***, in terms of observational learning, involves observing another accomplishing a similar task and deriving efficacy from it. In other words, when a person views another person of similar capacity, or who is otherwise deemed to be trustworthy, accomplishing a task, the first person is able to increase in self-efficacy regarding a similar task. A similar mechanism takes place in even visualizing success in a task. As previously described, clients learn from therapists, and vice versa. Once the relationship is established, the right-brain-to-right-brain therapeutic relationship allows clients to learn self-regulation from the therapist (Badenoch, 2008).
3. ***Verbal persuasion***, the third source of self-efficacy, as the name implies, involves hearing verbal encouragement from reliable sources (well-respected, authoritative sources). It has limited power except in terms of increasing likelihood of

persistence in effort toward a given task. Whether they like it or not (or whether they recognize it, for that matter), therapists possess disproportionate power in their relationship with clients. Neuro-aware therapists use this power to persuade clients to recognize client strengths, sometimes referred to as a positive asset search. Therapists need not apologize or try to mitigate their power—it will always be there; rather, they harness it for the client's benefit.

4. **Physiological arousal or state** is the fourth source and is predicated on the reality that too much anxiety or fear—and concomitant levels of physical arousal—regarding a task can result in inaccurate or otherwise self-defeating personal assessments. To the extent that people can reduce their fear/anxiety responses, they will increase the accuracy of their self-efficacy. This is true for affective states as well as physical states (e.g., fatigue after physical exertion leading to belief that one is inadequate for the task). Recall the assertion from the beginning of the chapter: behavior matters. From a self-efficacy perspective, this is especially true. When clients, like most humans, experience anxiety, fear, or other strong emotion, they can act without thinking (as described earlier in this chapter). It is this *action* that creates or exacerbates the problem, not the emotional experience itself (Wolpe, 1973).

SCT in Session: DaNeta Continued

One of the first questions for DaNeta in this approach could be "Where did you learn to respond to events this way?" In so directing the conversation, the therapist is cueing her that this is learned behavior, and behavior that is learned can be unlearned. The therapist is also indicating that DaNeta is both capable of and responsible for behavioral change, especially since her behavior is mediated through her thinking. Next, the therapist will identify the most likely sources of building self-efficacy, or identifying the strongest antagonists. In DaNeta's case, the physiological arousal she feels in response to her anger, which results from the avoidance of assertion in her day-to-day interactions, is being interpreted as all that is real and demands a reaction. Therapy will include relaxation training in order to assist her thoughts in mediating the neural path between her physiological arousal and behavioral reactivity.

Rational Emotive Behavior Therapy

Bandura's work, while a landmark in its own right, also served as a vital link to the next evolution of behavioral approaches, rational emotive behavior therapy (REBT), developed by Albert Ellis (e.g., Ellis & Velten, 1992). Just as Bandura's work liberated our behavior from contingent-only reinforcers, Ellis's work liberated our understanding of behavior from irrational emotional processes. Feelings and emotions are certainly real, but they are not necessarily reality based. Ellis might add to this that emotions, while real, are not always rational. And it is here that his work expands Bandura's and makes

Figure 4.3 Activity on Learning

Using a watch or phone with a timer, trace the maze in Figure 4.3 from beginning to end and see how long it takes.

Now try it again: same maze, beginning to end, and time yourself.

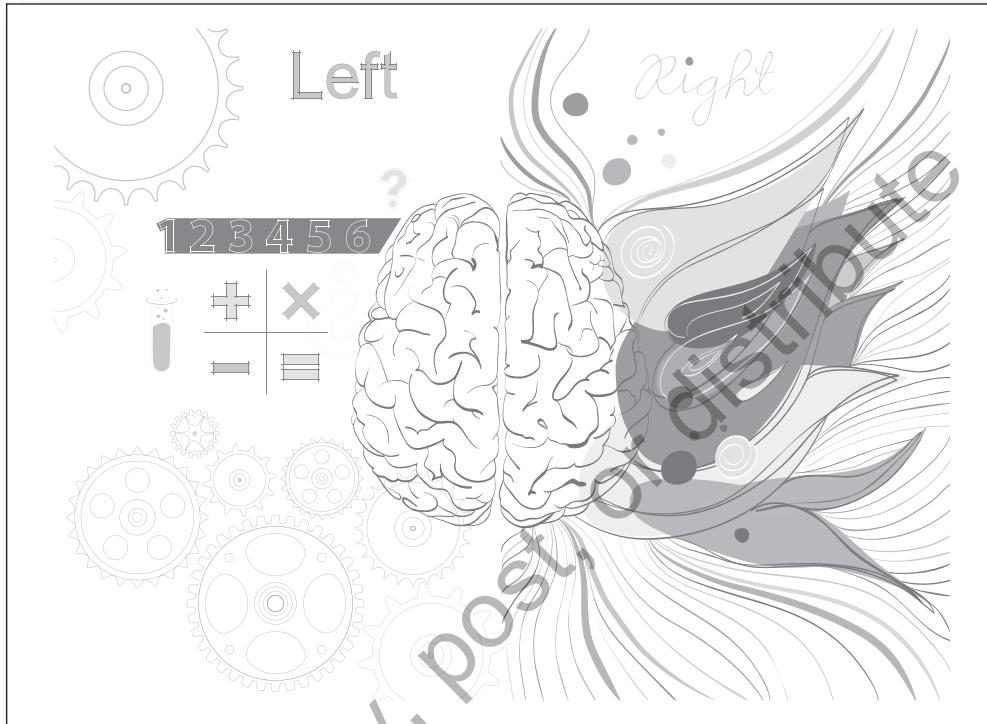
Repeat this for a third time.

Now note your times. What happened to them? Most likely your times decreased. This is an example of learning and its connection to memory!

Source: ©iStockphoto.com/Jorgenmac.

the connection to the next neuroscientific principle at work. Rational emotions, those emotions filtered through cognitive processes based on logic, empower individuals to feel and behave like they want to feel and behave. At the neurological level, we see this play out in the bilateral nature of the brain. While you'll read a lot of criticisms of the two-brain model, one thing is clear: the two hemispheres of the brain, even when processing information in a parallel fashion, still interpret data from the environment (both internal and external) in different ways. The left hemisphere is concerned with the four *Ls* as Siegel (2006) puts it—literality, language, linearity, and logic; whereas the right hemisphere processes creativity and holism—gestalts, if you will. Of course, this does not mean that there is a logic brain warring against a creative brain. Instead, each hemisphere has a primary process (Figure 4.4).

Figure 4.4 Bilateral Brain



Source: ©iStockphoto.com/Jorgenmac.

Consider the relative value of two complementary, not competing, systems for interpreting information. When balanced—or, as Siegel (2006, 2012) and later Badenoch (2008) refer to it, bilaterally integrated—the result is akin to rational emotions leading to rational behavior. However, when the right hemisphere exerts dominance, as a result of biology, environment, and experiences, emotion rides roughshod over reason. Consider for a moment whether you've met someone like this. You likely know people who live their lives in a right-brain-activated existence, where emotion predominates, leaving them (and their loved ones) at the mercy of their moods and feelings. In therapy, these clients often wear the moniker of bipolar disorder, mood disorder, and even anxiety disorders (but more on these in Chapters 7 and 8). Therapists who focus on emotions and emotion regulation tend to find themselves pouring gas on a fire, since these clients live an emotion-focused existence. From an REBT perspective that recognizes left-brain-to-right-brain processing, therapy must focus on rationality, a left-hemisphere activity, if clients are to find relief from their symptoms. Attempting to help a client *feel* better or even to *act* differently before strengthening left-hemisphere processing of information can take therapy down a primrose path.

In therapy with emotionally reactive or activated clients, for example, we tend to use a left-brained, if you will, REBT approach. These clients often, ironically, seek to rationalize or justify their emotions and subsequent behaviors with “Well, you weren't there! If you were, you'd

know why I'm so upset and why I reacted like I did!" So, we ask them to imagine that a camera had been recording the event (Figure 4.5), and to tell us what it would play back to us—what would we see on the video?

Almost without exception, the response is a version of "You'd see them pissing me off!" and then the client settling back in the chair, arms folded, as if this is self-evident. The therapist would persist, asking the client to describe the behaviors of the other person we'd see on the video, until the client could concretely describe what actually happened. What emerges in such sessions is not actual behaviors, but behaviors that have been interpreted through an emotionally activated filter. Clients, as this more rational reality begins to sink in, seem to appreciate that we are not trying to take their emotions away from them. This process strengthens left-brain processing of information by challenging the client's perception of the source of the emotions. *Feelings are real, but they are not always reliable.* We are rarely, if ever, going to attempt to directly change a client's feelings. Instead, therapists look for clues to what is feeding those feelings and explore that with the client. They also explain to clients about the complementary stimulus processing of the left and right hemispheres. It can be explained that both are absolutely essential, but when one overfunctions and the other underfunctions, thinking, feeling, and behavior become unbalanced.

Figure 4.5 Camera



Source: ©iStockphoto.com/akkis.

REBT in Session: DaNeta Continued

Imagine DaNeta's reaction when the therapist tells her that she can't help her feel better, at least not directly. Understandably, it is tough to take. But this is the truth of therapy: our methods are far less efficient in modifying clients' feelings than their own—that's why it takes clients awhile to seek treatment and the reason for their ambivalence about change. Ellis would reframe DaNeta's goals, rolling in his philosophical but ultimately behavioral goals of unconditional self-acceptance, unconditional other acceptance, and unconditional world acceptance. These goals—this approach—foreshadowed the constructivist philosophical influence on behaviorism. DaNeta and many clients come to therapy looking to change in order to accept themselves, to change others so that they can learn to accept them, or to convince the therapist that they cannot change because of the world. A neuro-aware therapist would work with DaNeta to accept where she is now, in a world as it currently is, not as she might wish it to be. This begins to shift how her brain processes and interprets her thoughts, feelings, and behaviors.

Mindfulness and Acceptance Approaches

The evolution of behaviorism, cognitive therapy, and cognitive-behavioral theory, as alluded to in the preceding section, has resulted in the convergence of the best clinical thinking regarding the relationship of thinking, feeling, and behavior. Aaron Beck's cognitive therapy (see A. Beck [1964] or J. Beck [1995]) really shone the light of cognition on radical behaviorism's mindless-human model and, in so doing, along with Bandura's SCT (discussed above), helped to usher in third-wave behavioral approaches. These approaches—most notably mindfulness-based cognitive therapy, or MBCT (see Segal, Williams, & Teasdale, 2012); dialectical behavior therapy, or DBT (see Linehan, 1993); and acceptance and commitment therapy, or ACT (see Hayes, 2004)—have brought to bear on the field the weight of empiricism from behaviorism, the power of the clinical relationship, and the ever-expanding, complex, and dynamic interactions in human thought, behavior, and emotion.

Dialectical Behavior Therapy Concepts

DBT illustrates the metamorphosis that behavior therapy has undergone. It emerged from Marsha Linehan's (1993) work with clients' repeated suicidal and parasuicidal behaviors. She identified the dilemma in treatment with these individuals that required a combination of compassion and structure, utilizing behavioral analysis of client-articulated goals. She further identified that clients with these behaviors often occurred in the context of borderline personality disorder, or BPD (Linehan et al., 2006). Her innovative approach has enjoyed tremendous success with this population and continues to evolve into a comprehensive treatment paradigm. Long before neuroscience in therapy grew to its current state of popularity, Linehan was walking the tightrope of healing relationships with skills and behavior training, in effect utilizing the right-brain-to-right-brain dynamic to facilitate neuroplasticity.

Dialectics is a philosophical worldview that, when applied to DBT, embodies the give-and-take, back-and-forth relationship between counselor and client. Linehan (1993) describes two contexts for the term thusly: “[t]hat of the fundamental nature of reality and that of persuasive dialogue and relationship” (pp. 30–31). In the first instance, the dialectical worldview embraces concepts such as *interrelatedness* and *wholeness*, leading to a new understanding of self as self-in-context. Another concept related to dialectics as a worldview is polarity. The principle of *polarity* understands reality to be fluid, not fixed, paradoxical rather than complementary. Linehan found that in working with clients diagnosed with BPD, their view of reality at any given time tended to be fixed and lacking in flexibility. Lastly, the principle of *continuous change* highlights the give-and-take nature of the therapeutic process in which the client, the counselor, and the treatment itself are growing alongside each other, changing and emerging. While at times this description can seem esoteric, it is a fundamental philosophy guiding the approach, leading to the second use of the term: *dialectical persuasion*. Linehan's use of dialectics here involves communicating with clients using personal language and polemics to usher change rather than formal logic to outthink clients. “What is being left out of our understanding” is the fundamental question that guides the dialectic in therapy, emphasizing the impermanence of reality and the often-confounding nature of truth and reality.

Mindfulness is a core skill in DBT and involves several core skills that are discussed in Chapter 6 as a part of strategies and interventions. Mindfulness is “intentionally living with awareness in the present moment, without judging or rejecting the moment and without attachment to the moment” (Neacsiu, Ward-Ciesielski, & Linehan, 2012, p. 1005).

Acceptance and Commitment Therapy Concepts

ACT (Hayes, 2004) begins with a philosophical position called functional contextualism wherein acts are understood only within their context. It is a reaction of sorts to the earlier, mechanistic forms of behaviorism that look only at the thought or behavior that may be causing a disturbance. It is a pragmatist philosophy eschewing “why” and examining “what,” such that the emphasis is away from questions of truth and onto questions of “Will this work?”

Following in the line of behaviorism, ACT (pronounced *act*) highlights a point discussed earlier by Bandura (1986) regarding the power of symbolic capacities through language. ACT, like Bandura, recognizes the limits of language to accurately represent internal phenomena, and the ways in which language can arbitrarily ascribe meaning to those phenomena. Whereas cognitive and traditional behavioral approaches might attempt to identify and confront negative or disabling thinking, ACT would direct a client to recognize that a thought is only as powerful as the attention it receives. Accepting these thoughts as thoughts allows the clients to release the power these thoughts have over them, rather than giving undue attention to them by confronting them. In essence, the words formed in the left hemisphere create visualizations of those words in the right hemisphere, developing a picture of that language. That visual language can easily take on a life of its own, neurologically.

Psychological flexibility is the core concept at the intersection of the following six psychological concepts. It involves embracing full humanness by learning to adjust to the world as it is instead of requiring that it change for us. *Acceptance* is “the active and aware embrace of private experiences without unnecessary attempts to change their frequency or form” (Hayes, Pistorello, & Levin, 2012, p. 982). This acceptance, as distinguished from acquiescence or resignation, stands in stark contrast to avoidance of experience. In acceptance, we can see reflected the mindfulness movement in cognitive-behavioral approaches. In contrast to flexibility, clients with fixed cognitive orientations have, in the Hebbian sense, more difficulty making changes, both behaviorally and neurologically and behaviorally. The extent to which this fixed orientation exists genetically prior to the fixed status remains unclear.

Cognitive defusion is the “decrease in believability of, attachment to, or impact of private thoughts and experiences rather than an immediate change in their frequency” (Hayes et al., 2012, p. 983). The inverse, fusion, is the tendency for humans to take words, thoughts, and feelings too literally, thereby imbuing them with unnatural and even harmful levels of power. ACT views language as limited primarily when we understand it too literally, resulting in negative behavior. For example, “I’ll be right over” means different things to different people. If I interpreted it too literally, I might expect your arrival in mere moments, whereas you might mean 30 minutes. My literal interpretation might lead to

disappointment or resentment. Cognitive defusion allows for more flexibility in letting thoughts “float by” as if their meaning was variable. Instead of confronting my disappointment-related thoughts such as “That person is so unreliable,” I can imagine those thoughts as meaning less, allowing myself more flexibility of thinking and feeling. In a startling finding in this area, Hayes et al. (2012) discovered that depressed clients with a good rationale for being depressed are more resistant to treatment!

Standing in contrast to rigid attention to thoughts and feelings, *being present* is the next of the six core psychological conditions and means resisting focusing on the past or future. It means having the freedom to remain in the moment and is tied to mindfulness.

Noticing self is the core concept that involves accepting oneself, as one is, not as who one thinks one should be.

Another strength of the ACT approach is related to *values*. Goals of treatment are based on assisting clients to behave in line with their values. Hayes et al. (2012) highlight findings that indicate that guilt and coercion are poor motivators of behavioral changes. In contrast, values-based actions are far more effective.

Last is *committed action*. As with all behavioral approaches, committed action, or consistency in effort, is key.

REFLECTION EXERCISE

Imagine you are standing in the surf at the shore of the ocean, about chest deep. As you look out toward the horizon, you notice a rather large wave rolling in toward you. At this point, you have a few seconds to make one of several choices:

1. You can turn and run for land, which will likely result in the wave plowing you into the ocean floor.
2. You can attempt to leap over the wave, resulting in loss of balance (unless you are a preternaturally powerful leaper) and again get plowed under by the wave.
3. You can stand your ground, determined to fight the force of this wave.
4. Or, you may choose a counterintuitive course, in which, as the wave bears down, you simply submerge yourself completely, allowing yourself to be, for a time, completely overwhelmed by the wave, only to emerge largely unscathed. The last tactic is somewhat akin to ACT—recognizing that waves (thoughts, feelings) will come at us when we are chest deep and tempted to panic, run, or fight for a way out, over, or through until we recognize the wave for what it is: natural, inevitable, and powerful—depending on the reaction we have toward it.

Now imagine what happens in your brain when experiencing an unpleasant emotion. The prefrontal cortex (higher-order thinking), as powerful as it is, may exert tremendous effort to subdue the emotion, but the limbic system proves too great a foe—in that moment!

ACT challenges empirically the notion that the most effective means of addressing negative, maladaptive emotions is to confront them, as with traditional CBT or REBT (Hayes, 2004; Hayes et al., 2012). In contrast, Hayes describes acceptance as the ability of clients to bring into awareness their experience of certain feelings, but without the often-concomitant pressure to do something about them. He explains this in terms of the literalness of language with its inherent limitations. This is best demonstrated through research on depressed individuals; as noted earlier, those who seem to have a strong argument for being depressed are more depressed and more difficult to treat than those who don't.

As discussed above regarding the functioning of the brain's left hemisphere, stimuli tend to be processed literally and logically. Clients who experience feelings and emotions too literally in their left hemisphere (where language is primarily processed) can create a total gestalt of that feeling-language in their right hemisphere, resulting in an emotion-based reality that may be maladaptive. For example, the statement "I'm so anxious I'm going to lose control" can be created in the brain as a literal thing, the impact of which could result in behavior that becomes, in fact, out of control. Combining neuroscience with ACT, for example, therapists ask clients to re-create, to the extent possible, the anxiety experience, without trying to reason them out of these feelings. Instead, I might ask the client how long these anxious experiences have persisted. Most clients don't know because they have reacted in the moment to their perceived reality of the experience. Note here that the renowned behaviorist Joseph Wolpe (1973) most stridently asserted that, from a behavioral point of view, it is not the emotion itself that is problematic (and for him, anxiety was the most pervasive emotional experience that caused clients problems); it was instead the behavior used to avoid feeling the emotion. So in session, we practice "sitting with" uncomfortable emotions. This is the principle behind flooding—intense, extended exposure to an anxiety-provoking stimulus (situation) without using avoidance behaviors to cope or compensate. From an ACT perspective, this means committing to the process of affective awareness *without* action. Instead, Hayes recommends assisting clients in viewing uncomfortable or painful emotions like the scenery passing by the window on a train—there and then gone. It is the literalness of emotional experiences and related thoughts, followed by reactive, avoidant behavior, that prevents people from living the life they want to live, at least from this perspective.

ACT in Session: DaNeta Continued

The first goal of DaNeta's ACT therapist is the foundational principle presented by Hayes, Strosahl, and Wilson (1999), psychological flexibility, wherein the goal for DaNeta is to let go of her rigidity regarding escaping her distress and to move instead toward increasing her behavioral repertoire. The therapist wants to help DaNeta understand that it is not the feelings themselves that are causing her distress as much as it is her feelings about her feelings. She feels upset and then gets upset about being upset. She then limits her behavioral options by polarizing her choices into repression or confrontation. From an ACT perspective, the therapist wants to help her develop a flexible psychological style in which she is able to observe her emotional experiences from a bit of a distance, such that she is able to evaluate the situation and make decisions from that place of distance.

Reality Therapy

William Glasser's (1965) contribution to this discussion is multifaceted, in part because of the challenges associated with classifying his approach into a specific theoretical approach. While overtly behavioral, it is decidedly postmodern as well (Prochaska & DiClemente, 2014). For our purposes, it will suffice to examine one primary component of the model as an extrapolation from choice theory: that of Wubbolding's (2000) WDEP intervention approach. My take on the approach involves paraphrasing the four questions and then adding one question:

1. Wants Question: What do you want?
2. Doing Question: How are you behaving?
3. Evaluation Question: How's that working?
4. Planning Question: What now?
 - +1. Mindfulness Question: How does what you are doing tell us what you actually want?

At this point, it becomes clear that by becoming mindful of their behaviors, in light of their stated goals, clients are confronted by their discrepant experience. It has been said that the brain will believe anything you tell it. Often, clients persist in expressing goals with which their behavior seems highly unlikely to come into correspondence. Without mindful attention to this disconnect, they are likely to continue to experience despondency and low self-efficacy due to unreflected goals that they have no real investment in. The brain is busy creating this narrative as a legitimate goal while the behavior will never come in line with it. DaNeta finds herself in a similar dilemma.

Reality Therapy in Session: DaNeta Continued

Once a sufficient level of rapport has been built with DaNeta, her reality therapist asks her the WDEP questions. The discussion goes something like this:

Therapist: DaNeta, in terms of your life and values, what are three things you want from your life?

DaNeta: I want to be happy, to fight less with my husband, and to feel more in control of my life.

Therapist: In light of those goals, what would you say you're doing, in terms of reaching those goals?

DaNeta: [Pause] I'm not doing anything.

Therapist: I think you are actually doing a lot. For now, would you say that what you are doing is getting you what you want, as you just described?

DaNeta: Not at all.

Therapist: So it sounds like what you have been doing is not working.

DaNeta: Right.

Therapist: What would you say if I told you that I think it is working?

DaNeta: I don't see how.

Therapist: Well, let's think for a minute about what we can learn from your actual behaviors. What might they tell us about what you really want?

DaNeta: [A little defensively now] I already told you what I want.

Therapist: Stay with me for a second. You told me three things you want and then described how none of your behaviors are helping you obtain those things. Let's see if we can infer from your behavior what you really want.

You avoid conflict—which you are able to do for awhile—which may indicate that avoiding conflict or the emotions that accompany conflict is something you want, right?

DaNeta: Right.

Therapist: At the same time, you blow up and break things; how does that feel?

DaNeta: Bad. I feel guilty.

Therapist: [Waits and watches]

DaNeta: And powerful; really good in the moment, actually.

Therapist: So could we infer from your behavior that you also want to feel or be powerful?

DaNeta: [Hangs head] Yes, I guess that's true.

Therapist: Just a reminder here that this is not a shameful thing, and I'm not judging you. Therapy is about finding the disconnects in our story.

DaNeta: It just seems so childish, and obvious now.

Therapist: I hear you. So the question now is, what would it be like if you could feel different during conflicts and also feel or be powerful without those negative conflicts?

DaNeta: That is something I could really want!

Therapist: Let's get to work then.

Biology Box 4.1

Hebb's Rule

Perhaps the best way to sum up our understanding of Donald Hebb's discovery can be embodied in the following quote by Louis Cozolino (2010) in *The Neuroscience of Psychotherapy*: "Cells connect and learning occurs through changes of synaptic strength between neurons in response to stimulation. Repeated firing of two adjacent neurons results in metabolic changes in both cells, which provides an increased efficiency in their joint activation. In this process, called long-term potentiation (LTP) or Hebbian learning, excitation between cells is prolonged, allowing them to become synchronized in their firing patterns and joint effectiveness" (p. 67). It is not a deterministic position but does highlight the electrochemical response our neurons have to our repeated thoughts, feelings, and behaviors.

Neuro in the News

Study Shows How Learning New Ideas Alters Brain Cells

This 2014 study is particularly important to follow the Biology Box on Hebb's rule, in that it is another popular reference to neuroscientific research on the brain's physical changes in responses to learning. As discussed in this chapter, if our clients can learn a maladaptive behavior, there's hope that they can unlearn that behavior, in addition to learning new behaviors. This particular study focuses on the fatty acid that impacts the conductivity of nerve signals at the synapse. The article includes a terrific quote from the lead author of the study that speaks directly to neuroplasticity and the impact the therapeutic relationship can have on clients' brains through learning: "Brain activity can change both the structure of this protein, as well as its function," with the result being improved neural conductivity and efficacy.

Source: Study shows how learning new ideas alters brain cells. (2014). *Lab Product News*, February 26. Retrieved from <http://www.labcanada.com/news/study-shows-how-learning-new-ideas-alters-brain-cells/1002935820/?er=NA>.

SUMMARY

Behaviorally oriented therapists work to build rapport to a greater extent than has ever been acknowledged in the literature, especially in terms of critiques of behavioral approaches. To the extent that relational skills have always been important, they are more heavily emphasized in modern iterations, and then even more so based on recent neuroscience findings discussed throughout this book. In addition, behavioral therapists no longer view clients (and all humans) as mindless reactors to environmental stimuli. It is

interesting that in Chapter 2, the dominant view regarding consciousness was that most of what we perceive as will and volition, even conscious thought, is illusory. Rosenthal (2000), in contrast to the unconscious determinism view, asserts:

Despite their both involving access to our mental states, consciousness and metacognition are distinct phenomena. For one thing, we often make judgments about whether we have learned something or whether we know something without consciously accessing the relevant information—sometimes, even, when that information is, for some possibly transient reason, not currently accessible. Judgments of learning and feeling-of-knowing judgments often occur without current recall. We can, it seems, be conscious of knowing something without being conscious of the thing we know. (p. 204)

The brain is always active, whether we acknowledge it or not, observing, interpreting, and making decisions. Assuming that passive acceptance of a situation, say a negative emotional state, keeps the brain static is a misapprehension of how the brain works. Clients can benefit from understanding that in stasis, the brain is strengthening the networks that maintain that stasis, making it more likely that the next time a negative emotion is present, passivity will result. Directing clients to act, particularly in an opposing direction to which their emotion may be leading, can challenge these neural networks and becomes a catalyst for neurological change and for future behavioral changes.

NOTES

1. As you might expect, “DeNeta” is not a real client, and yet she is quite real in that she is an amalgam of many years of clients. Additionally, case studies representing particular models of therapy often play to their strengths in the model. For instance, a classic case study approach for behavioral therapy is addressing a bad habit, such as overeating or poor social skills. Instead, here I explore the oft-controversial diagnosis of bipolar disorder and its intense emotionality.
2. I owe a debt of gratitude to a professor in my master’s program, Allan McKechnie, who introduced me to this concept that has stayed with me these many years of practice.
3. A favorite approach of mine when clients respond with “nothing” or with “I don’t know” is to simply ask, “Well, what would you say if you did know?” Believe it or not, I don’t think I’ve ever had a client persist in “not knowing”; they always are able to generate a response!

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