

ACCEPTANCE AND COMMITMENT THERAPY: APPLYING AN ITERATIVE TRANSLATIONAL RESEARCH STRATEGY IN BEHAVIOR ANALYSIS

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Acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 1999) is a behavior-analytic model of intervention and behavior change. ACT is grounded in a post-Skinnerian account of language and cognition, relational frame theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001), that codeveloped with ACT. ACT and RFT are linked to an elaboration and extension of the traditional behavior-analytic model of how best to build and extend psychological knowledge, which we have termed a *contextual behavioral science* (CBS) approach (Hayes, Levin, Plumb, Boulanger, & Pistorello, in press; Vilardaga, Hayes, Levin, & Muto, 2009). In this chapter, we describe the ACT model and enough of the underlying theoretical underpinnings and scientific strategy to place data on its impact and change process in the proper context. We link CBS to the challenges faced by an inductive approach in translation and system building.

UBIQUITY OF HUMAN SUFFERING, CONFLICT, AND SELF-HARM

In many ways, human beings are a spectacularly successful species in their ability to compete with other species for resources, to protect human populations from predation, and to regulate the environment to their own ends. Despite these successes, human beings in the modern world face a startling amount of emotional suffering and behavioral and social problems that threaten individual and societal health and well-being. An example of the staggering amount of individual suffering can be seen in the

National Comorbidity Survey conducted from 2001 to 2003, which estimated that approximately 26.2% of Americans experience a diagnosable psychological disorder within a given year (Kessler, Chiu, Demler, & Walters, 2005) and that 46.4% experience at least one of these disorders in their lifetime (Kessler, Berglund, et al., 2005). The prevalence of psychological problems is probably much higher when one considers the number of individuals struggling with subclinical problems and adjustment issues, such as divorce, violence, stress, loss of a loved one, abuse, and substance use problems, among many others. Physical health problems linked to unhealthy behavioral patterns are also highly prevalent. For example, rates of obesity have been steadily increasing in the United States, with current estimates showing that approximately 32.2% of U.S. adults are obese (Ogden et al., 2006). When one considers these behavioral problems as well as others such as environmental issues and global climate change, violence, prejudice, inequities in the distribution of wealth, poverty, disease, inadequate health care, and poor education, the need for a more adequate behavioral science is obvious.

BROAD VISION AND NARROWING SCOPE OF BEHAVIOR ANALYSIS

Behavior analysis represents an attempt to develop a comprehensive science of behavior that addresses these challenges. A behavior-analytic approach is humble in that it seeks to identify principles of behavior in research laboratories and apply them to

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the prediction and influence of behavior. Observations of environment–behavior interactions in tightly controlled basic research studies are abstracted into broadly applicable yet precise principles. The ultimate goal of behavior analysis is bold: to develop a psychology adequate to the challenge of the human condition. Thus, basic research is part of an overall inductive strategy that seeks to rise to the challenge of even the most profound human difficulties.

The original scope and aim of behavior analysis can be seen in B. F. Skinner's writings. His utopian novel *Walden II* (Skinner, 1948) highlighted the importance to a science of behavior of such complex issues as politics, morality, social equality, and education. The value of such a book is not the design of a specific form of society (see Skinner's introduction to the book) but rather the provision of an example of how scientists might rise to the challenge of these issues. It was a bold statement of a goal for his science: "Our culture has produced the science and technology it needs to save itself" (Skinner, 1971, p. 181). Unfortunately, in the 40 years since, behavior analysis, both basic and applied, has had its impact primarily in a narrow band of problem areas. In the applied domain, behavior analysis is truly mainstream only in the areas of special education and developmental disabilities (e.g., Charlop-Christy, Carpenter, Le, LeBlanc, & Kellet, 2002; LeBlanc et al., 2003).

In the traditional behavior-analytic narrative, behavior analysis has the behavioral principles and applied behavioral technology needed to move toward its lofty goals (Skinner, 1971). In this way of thinking, the lack of impact of behavior analysis on mainstream issues is not the result of technological or conceptual limitations and barriers, but political. Indeed, late in his life Skinner, in conversation with Paul Chance, held out only one hope for changing this picture: "winning over a substantial number of influential people—educators, writers, journalists, scientists, and scholars—who might then pressure policy makers to take effective action" (Chance, 2007, p. 158).

ORIGIN OF ACCEPTANCE AND COMMITMENT THERAPY

ACT developed within behavior analysis in the late 1970s and early 1980s (e.g., Hayes, 1984; Zettle &

Hayes, 1982, 1986). ACT/RFT developers attempted to understand and apply Skinner's concept of rule-governed behavior (Hayes, 1989) and made some progress in viewing clinical phenomena that way (e.g., Zettle & Hayes, 1982). Yet, they kept coming back to the fact that no adequate definition of *rule-governed behavior* existed. Skinner defined *rules* as contingency-specifying stimuli, but there was no definition of what *specifying* means and how it develops (Parrot, 1983). ACT/RFT developers concluded that they needed a new and more robust contextual behavioral account of human language and cognition that could lead to empirical advances, both basic and applied.

At the same time, behavior therapy was becoming cognitive–behavioral therapy on the basis of the perceived inability of behavior therapy to deal effectively with the problems of cognition displayed by clients. The theories of cognition, however, were based on an information-processing model and systematic observations made in clinical work (Beck, 2005) rather than on basic behavioral science. Given the utility of the behavior-analytic approach, ACT/RFT researchers thought this abandonment of behavioral principles was too high a price to pay. They tested these early cognitive theories to see whether they explained the impact of early cognitive–behavioral therapy methods or whether there were alternative explanations consistent with principles of behavior discovered in basic science laboratories. For example, the possible effect of self-statements on therapeutic change were shown to not be the result of cognitive reappraisals but of the effects of socially mediated contingencies of reinforcement (Hayes & Wolf, 1984; Rosenfarb & Hayes, 1984; Zettle & Hayes, 1983). Bandura's (1973) notion of modeling was challenged by showing the important role of sensory reinforcement in children with aggressive behaviors (Hayes, Rincover, & Volosin, 1980), and researchers explored a behavioral account of how self-monitoring produces improvements in mood symptoms in contrast with existing cognitive accounts of this phenomena (Harmon, Nelson, & Hayes, 1980). Researchers also looked at the importance of experiential feedback versus instructions in treating social skills deficits in adults (Rosenfarb, Hayes, & Linehan, 1989). The findings

from these studies led them to abandon cognitive theory and seek another way forward.

The first alternative analyses (e.g., Hayes, 1984) and basic and applied studies (e.g., Devany, Hayes, & Nelson, 1986; Zettle & Hayes, 1986) that led to ACT and RFT appeared in the early to mid-1980s (see Zettle, 2005, for a history of ACT). For example, Zettle and Hayes (1986) found that comprehensive distancing, an intervention based on an analysis of verbal social contingencies and the predecessor to ACT, produced significantly greater improvements in depression than traditional cognitive therapy. Devany et al. (1986) found that children with language disabilities did not form stimulus equivalence classes under conditions in which mental age-matched children without language disabilities were able to, which provided initial support for the idea that derived stimulus relations support the development of language abilities (subsequent research has largely confirmed that relationship; e.g., see Vause, Martin, Yu, Marion, & Sakko, 2005, but not the idea that language abilities lead to equivalence or other derived relations, which RFT from the beginning explicitly rejected). Because the results from early studies such as these proved empirically positive, outcome studies on ACT were put on hold for nearly 15 years while the basic account and strategic approach was developed. In 1999, the first ACT volume appeared (Hayes, Strosahl, & Wilson, 1999), followed 2 years later by the first RFT volume (Hayes, Barnes-Holmes, & Roche, 2001).

To understand ACT, one must understand its philosophical assumptions, basic principles, and approach to system development—that is, to consider what transpired in that 15-year gap. To that topic, we now turn.

CONTEXTUAL BEHAVIORAL SCIENCE: THE UNDERLYING SCIENTIFIC STRATEGY IN ACCEPTANCE AND COMMITMENT THERAPY AND RELATIONAL FRAME THEORY

The ACT–RFT approach to system building represents a somewhat distinct scientific development strategy that we call a *CBS approach* (Hayes et al., in

press; Vilardaga et al., 2009). This strategy is based on, but also extends, traditional behavior analysis.

Functional Contextualism: The Philosophical Foundation of Acceptance and Commitment Therapy and Relational Frame Theory

Philosophical assumptions, such as how truth is defined and the unit of analysis, provide the bases for any scientific approach. These assumptions are frequently left unexamined in mainstream psychological research, but that just means that the assumptions underlying such research are unexamined, not that the research is being conducted without assumptions. Because the assumptions underlying behavior analysis are not mainstream, specifying these assumptions is part and parcel of the behavior-analytic approach (e.g., Skinner, 1974).

RFT and ACT are rooted in a particular philosophy of science known as functional contextualism (Hayes, Hayes, & Reese, 1988). Although functional contextualism differs in some of its details from radical behaviorism (especially in its explicit rejection of ontological claims, its emphasis on the a priori nature of analytic goals, and the details of its specific goals), we have argued that these assumptions make best sense of behavior analysis itself (Hayes et al., 1988). Well-known behavior analysts have disagreed, however (e.g., Marr, 1993; M. R. Ruiz & Roche, 2007), so it is more conservative to say that the assumptions of functional contextualism provide the foundation for CBS and ACT–RFT more specifically and for those in behavior analysis who agree with these modifications.

Functional contextualism defines *truth* to mean that an analysis is useful in meeting one's goals. Functional contextualists adopt as their scientific goal the prediction and influence, with precision, scope (breadth of application), and depth (coherence across levels of analysis), of the behavior of whole organisms interacting in and with a context considered historically and situationally. Prediction and influence is a unified goal—both are necessary. Thus, any analysis is true insofar as it is useful for predicting and influencing behavior and doing so in a way that applies precisely to the phenomena at hand, applies to phenomena within a specified

range, and coheres across levels of analysis (e.g., biology, psychology, anthropology).

Functional contextualism is consistently disinterested in ontological truth claims, preferring to stay connected to pragmatic truth and what is useful in achieving a given purpose. One benefit of this shift is an increased flexibility in the terms and methods used. A term or methodological approach can be “correct” insofar as it serves the purpose of the analysis in one context, whereas another term or approach may be useful in another.

A science of prediction and influence requires a particular focus on manipulable controlling variables (Hayes & Brownstein, 1986). Behavior itself is never directly manipulated. What is manipulated is, and can only be, the context of behavior. Causality is viewed as a way of speaking about how to accomplish goals, not as an ontological event, and relative to the goals of functional contextualism, behavior can never cause another behavior within the same individual because influence can only be conclusively demonstrated through manipulation. Thus, despite the fact that behavior and context are part of a dynamic interaction and one cannot be defined without the other, only context can be considered causal in a functional contextual approach.

These philosophical features are fundamental to the ACT clinical model itself. For example, values define what *workability* means and whatever is true for one’s clients is pragmatic, not literal. That will become clearer as we describe ACT.

Overview of Relational Frame Theory

The earliest work on ACT was based on Skinner’s (1969) concept of rule-governed behavior, but researchers soon realized that to understand what a rule was, it was necessary to understand what a verbal stimulus was. Viewing verbal stimuli to merely refer to the product of verbal behavior did not seem functionally adequate. RFT eventually provided a conceptually and empirically adequate answer.

The core idea behind RFT is that people learn to relate events in different ways, mutually and in combination, not simply on the basis of their formal properties but on the basis of arbitrary contextual cues. Young children will initially learn, for example, that a nickel is larger than a dime on the basis of

their formal properties. At the point at which “larger than” becomes arbitrarily applicable, that same comparative response can be controlled socially regardless of the form of related events—for example, a dime can be larger than a nickel. These mutual comparisons can be arranged into a set of relational responses—what is said in noun form to be a *relational network*—as when a child learning that a dime is smaller than a quarter can derive that a quarter is larger than a nickel. If a nickel is valuable because the child can use it to buy candy, a dime will likely now be more so, and a quarter even more so by derivation.

From an RFT perspective, all of this occurs because the child has acquired relational operants: classes of arbitrarily applicable relational responding established originally through multiple-exemplar training and brought under arbitrary contextual control. These classes are termed *relational frames*. This approach provided an answer to the question of the nature of verbal stimuli—they are stimuli that have their effects because they participate in relational frames—but it did so much more clinically and in application.

Relational framing skills have an enormous impact on human functioning. Humans can derive a wide variety of types of relations among events (e.g., Berens & Hayes, 2007; Dougher, Hamilton, Fink, & Harrington, 2007; Dymond & Barnes, 1995; Dymond, Roche, Forsyth, Whelan, & Rhoden, 2007; Hayes, Kohlenberg, & Hayes, 1991) that allow for novel responses to occur without a direct learning history. This ability to derive relations expands the potential impact of learning histories: Two learned relations (i.e., $A > B$, $B > C$) can provide an additional four derived relations (i.e., $B < A$, $C < B$, $A > C$, $C < A$); three trained relations can lead to nine derived relations; and so on.

Relational framing is also known to interact with direct learning processes such as operant and classical conditioning. For example, a study by Dougher et al. (2007) trained some adults and not others that stimulus A was less than stimulus B and stimulus B was less than stimulus C. Next, a shock was paired with stimulus B. For both groups, stimulus A produced a smaller skin conductance response than did B, but only for the relationally trained group;

C tended to produce larger responses than B despite the absence of any history of shocks in the presence of C. In other words, the stimulus functions of C were transformed on the basis of its participation in a comparative frame with stimulus B. Studies have shown such transformations with other stimulus functions. Events can acquire discriminative-like functions by their relations to discriminative stimuli, but without the history that meets the technical definition of a discriminative stimulus (Dymond & Barnes, 1995); the same is true of reinforcers (Hayes et al., 1991). Other functions, such as learned avoidance, are altered and transformed via relational frames (Dymond et al., 2007). The fact that relational responses are contextually controlled by arbitrary and nonarbitrary cues is important. If relational responding was not contextually controlled, then the number of derived relations and functions would quickly become overwhelming. A stimulus such as the printed word *bat* would evoke a countless number of derived relations to other stimuli (e.g., baseball, vampires, flying mammals), which would evoke even further relations (e.g., sports, monsters, other mammals). Similarly, the transformation of functions produced through relational frames is also contextually controlled. Experiencing sourness or salivation in response to the contextual cue “How does a lemon taste?” can be substantially different from what the same person might experience in response to the contextual cue “How does a lemon feel in your hands?” The words *taste* and *feel* serve as a context that cues a specific transformation of stimulus functions—without this contextual control, all of the functions would transfer or be transformed, and people would eat the written words *ice cream* or run from the written word *tiger*.

Research has provided support for the idea that derived relational responding is an operant. Initially, this evidence was somewhat indirect, such as in studies demonstrating that relational operants develop over time (Lipkens, Hayes, & Hayes, 1993), are contextually controlled (Dymond & Barnes, 1995), and can come under antecedent and consequential control (Healy, Barnes-Holmes, & Smeets, 2000; Roche, Barnes-Holmes, Smeets, Barnes-Holmes, & McGeary, 2000). In more recent years, several studies have provided more convincing

evidence by training relational operants through reinforced multiple exemplars, as would be expected of any operant (e.g., Barnes-Holmes, Barnes-Holmes, Smeets, Strand, & Friman, 2004; Berens & Hayes, 2007).

RFT has been applied to account for a range of complex verbal behaviors including analogical reasoning (Lipkens & Hayes, 2008; Stewart, Barnes-Holmes, Roche, & Smeets, 2002), prejudice (Weinstein, Wilson, Drake, & Kellum, 2008), spirituality (Hayes, 1984), education (Barnes-Holmes & Barnes-Holmes, 2001), self and perspective taking (McHugh, Barnes-Holmes, & Barnes-Holmes, 2004), and psychopathology and intervention (Barnes-Holmes, Barnes-Holmes, McHugh, & Hayes, 2004). Over time, this contextual behavioral account of language and cognition significantly changed how ACT treatment developers thought about applied problems and their amelioration.

How Verbal Processes Contribute to Human Suffering

The RFT account of language and cognition may provide insight into why so much human suffering occurs. In the sections that follow we explore ways in which verbal processes may contribute to human suffering, such as by increasing contact with aversive stimulus functions; narrowing behavioral repertoires; and producing rigid, ineffective patterns of behaviors based on rules and a verbally constructed sense of self.

Increased contact with aversive stimulus functions.

The ability to derive relations among stimuli on the basis of arbitrary contextual cues leads to an increased probability of contacting distressing stimuli. For example, in a relational frame of comparison, a child may be praised for an achievement but be upset because the praise is not as effusive as was hoped for. Simple equivalence relations can allow clients to “reexperience” the events of a trauma when describing it (i.e., the trauma elicits negative feelings and later verbal descriptions of the trauma, being in a frame of equivalence with the trauma, elicit some of the same negative feelings). Even positive stimuli may be related to aversive stimuli indirectly through a complex network of such relational

responses. For example, one may be reminded of the loss of a loved one by seeing a spectacular sunset that cannot be shared.

Narrowing of behavioral repertoires and experiential avoidance. Aversive control of behavior tends to narrow a behavioral repertoire because only a limited set of actions is likely to lead to reduction in aversive stimulation (i.e., escape or avoidance). The expansion of aversive stimulus functions through relational frames thus leads easily to narrowing of behavioral repertoires. This narrowing is particularly likely because the capacity to verbally identify a problem, predict the likely effects of several potential solutions, and select an option that is likely to achieve the desired outcome is probably a key evolutionary reason for the development of relational framing skills. However, once aversive private events are identified as bad experiences to be avoided, problem-solving skills can become focused on efforts to reduce the form, frequency, or intensity of emotions, thoughts, memories, or other private events. Because of the arbitrary applicability of relational framing, a vast number of stimuli must be avoided to evade distressing experiences. In addition, problem solving allows one to predict the occurrence of “bad” private events in situations that have never been directly encountered, leading to avoidant behavior occurring without any direct learning history and in cases in which aversive stimulation may not occur. This application of problem solving to private events can thus lead to a substantial narrowing of one’s life in which one rigidly engages in ineffective patterns of avoidance and escape behaviors.

The tendency to engage in narrow, rigid patterns of behavior attempting to control the form, frequency, or intensity of distressing private events is described in ACT as *experiential avoidance*. These behaviors often produce a range of negative consequences and even a paradoxical increase in the private events that one attempts to control. For example, research has consistently found that thought suppression, although sometimes effective for short periods of time, produces a paradoxical increase in the avoided thought (Abramowitz, Tolin, & Street, 2001). Similarly, the use of suppression

strategies has been found to increase reactivity to difficult tasks (Cioffi & Holloway, 1993; Levitt, Brown, Orsillo, & Barlow, 2004), reduce recovery from distress (Cioffi & Holloway, 1993; Masedo & Esteve, 2007), and increase the behavioral impact of distress (Masedo & Esteve, 2007). Experiential avoidance has been found to predict negative consequences in areas such as depression, anxiety, and chronic pain (Hayes, Luoma, Bond, Masuda, & Lillis, 2006).

RFT provides a potential account for why attempts to control private events are unlikely to be successful. First, rule-governed behavior can paradoxically increase the occurrence of the event because avoidance rules specify the stimulus to be avoided. For example, the rule “Don’t think about a jelly doughnut” involves stating the rule and checking on the efficacy of the rule (“Did I think about the jelly doughnut?” or even “I’m doing good at not thinking about a jelly doughnut”). Just as the reader may be imagining the sight of a jelly doughnut (and perhaps salivating a bit more), the individual using this rule is likely to experience the same; and if this rule is used as a dieting tool, it is likely to fail. Likewise, when rules such as “You must not feel anxious” produce increased anxiety, the failure may evoke an increase in the emotion, such as having anxiety about being anxious or feeling depressed about being depressed.

Experiential avoidance can serve to further elaborate the network of relations to the aversive stimulus. Behaviors engaged in to control the private event can themselves become associated with it. For example, the rule “Watch TV so you don’t think about how worthless you are” establishes a relation between TV watching and the thought “I’m worthless.” Future TV watching may evoke thoughts of worthlessness as a result. In addition, engaging in avoidance behavior strengthens the future behavior regulatory effects of the private event and reinforces the maladaptive verbal processes that specify the event as a harmful experience that must be avoided.

Fusion and rule governance. Rule-governed behavior is frequently characterized by a relative insensitivity to programmed contingencies (Hayes, 1989). It is not that rule-governed behavior is inherently insensitive to consequences—it is that rules

easily introduce social or other contingencies and can narrow the range of behavior available to contact changed consequences of responding (Hayes, Brownstein, Haas, & Greenway, 1986; Hayes, Brownstein, Zettle, Rosenfarb, & Korn, 1986). This is not as true of directly shaped behavior (Shimoff, Catania, & Matthews, 1981).

The problem is that formulations of verbal rules can occur without strong environmental support—even self-rules can reduce sensitivity to direct consequences of responding (e.g., Rosenfarb et al., 1989). Relational framing can dominate over other sources of behavioral regulation, a process ACT theorists have termed *cognitive fusion*. Cognitive fusion can focus attention more on the past and future and less on the present, because problem-solving rules generally require an analysis of the past and predictions of the future, but this focus can further limit sources of effective contingency-shaped behaviors. These effects may help explain why measures of cognitive fusion (e.g., Avoidance and Fusion Questionnaire for Youth [Greco, Lambert, & Baer, 2008], Automatic Thoughts Questionnaire—Believability [Zettle & Hayes, 1986], Stigmatizing Attitudes—Believability [Hayes et al., 2004]) have consistently shown that it predicts poor psychological outcomes.

Dominance and rigidity of a verbally constructed sense of self. Literal language processes can also have negative consequences when they are over-applied to the self. A *conceptualized self* can be defined as the discrimination of an individual's own behavior in terms of his or her verbally constructed self-descriptions and evaluations. In RFT terms, this means that a relational network is established specifying the various qualities, abilities, and other features of self. A likely reinforcer for this process is the coherence of the story. This story becomes something that subsequently needs to be defended to maintain the coherence of one's verbally constructed past and future, even if it comes at the loss of more effective responses that would counter the story. Thus, a conceptualized self can lead to rigid, ineffective rule-governed behavior. RFT further adds to these areas by providing an analysis of how these effects might be changed, a topic to which we now turn.

Verbal Processes That Support Effective Behavioral Repertoires

RFT points to how human suffering is a natural result of normal language processes, but that alone is not much of a contribution. What makes RFT important is that it (a) cautions against common-sense interventions to reduce the negative impact of verbal processes and (b) suggests interventions that might be more helpful. For example, a common-sense approach to the negative impact of verbal rules would be to correct the rules. RFT, however, suggests that could be dangerous. There is no process in learning called *unlearning*—extinction inhibits past learning; it does not erase it—and changing a rule, even if successful, may leave the original learning intact and further increase cognitive fusion and rule governance in other domains. Moreover, it would elaborate the relational network. Consider a person with the thought “I’m bad” who is told to replace that thought with “No, I’m not because I [list positive things].” This will not eliminate “I’m bad” from the repertoire; it will merely embed it into a large set of relational responses. If the goal is new actions (e.g., creating meaningful relationships), that may be unhelpful.

RFT suggests an alternative exists. In RFT, some contextual factors control the derivation of relations (the relational context), and a different set of contextual factors regulate the transformation of stimulus functions (the functional context). A behavioral analysis of language and cognition requires not only the identification of the contextual cues that lead to the emission of specific forms of relational responding but also to contextual cues that lead to specific behavioral functions. A working knowledge of these contextual factors can inform methods of intervention. The dominant and ineffective impact of verbal processes on behavior is thought to be controlled by contexts of literality and reason giving. These contexts can themselves be changed. Thus, RFT suggests that in many cases, the key would be to diminish the impact of verbal stimuli by altering the social and verbal context. A host of possible methods can do this—methods that are used in ACT. For example, a person struggling with the thought “I’m bad” might sing it as an opera, say it over and over quickly, or say it in the voice of a cartoon character.

These methods alter the contexts in which “I’m bad” has aversive or repertoire-narrowing functions.

In much the same way, experiential avoidance is argued to be supported by particular contexts such as using emotions as a reason for behavior. In everyday verbal interactions, private events are often cast as problems that need to be solved by attempting to change their form, frequency, or intensity. Alternative contexts can be established in which private events are less tightly linked to overt behavior. Acceptance and mindfulness of private events is such a context, and we discuss it further in the following sections.

Verbal behavior can also be used to enhance or alter reinforcers. *Motivational augmentals* refer to cases in which the reinforcing value of a stimulus is temporarily increased through participation in relational frames. Verbal behavior can make remote consequences seem more proximal or probabilistic consequences seem more important. Values statements are examples of such verbal establishing operations (Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009; Elliot & Harackiewicz, 1996; Sheldon & Elliot, 1999).

A unique property of relational framing is the ability to take perspective on oneself and to take the perspective of others. RFT has termed this form of relational framing as *deictic framing*, which refers to the fact that to make accurate and consistent distinctions between I–you, here–there, and now–then, one always needs to take the perspective of a speaker. These frames are abstracted through multiple exemplars (e.g., “What are you feeling now?” or “What was she feeling then?”), and they have implications for social functioning and psychopathology. For example, deficits in deictic framing ability are related to the autistic spectrum (Rehfeldt, Dillen, Ziomek, & Kowalchuk, 2007) and to social anhedonia (Vilaradaga, Estévez, Levin, & Hayes, in press; Villatte, Monestes, McHugh, Freixa i Baqué, & Loas, 2008), which is one of the known predictors of psychosis (Chapman, Chapman, Kwapil, Eckblad, & Zinser, 1994). Deictic verbal cues can be deliberately used in ACT with the aim of improving social relationships and at the same time foster a more integrated and flexible sense of self and others.

DEVELOPING A THEORETICAL MODEL OF PATHOLOGY, INTERVENTION, AND HEALTH TIGHTLY LINKED TO BASIC PRINCIPLES

Before we proceed to describe ACT, a key aspect of a CBS approach is worth mentioning. In the original vision of traditional behavior analysis, technical terms developed in basic research are used for the prediction and influence of behavior. Parenthetically, *influence* is a clearer term here than the usual term *control* because *control* means both change in behavior and elimination of variability, whereas *influence* has only the former connotation. A CBS approach envisions a more reticulated process in which basic and applied principles coevolve. For that to happen, however, user-friendly analyses are needed that practitioners can access without fully grasping the details of the basic account, while a smaller number of scientists work out technical accounts in these domains on the basis of their mutual interest.

The clinical model that underlies ACT is made up of what we call *mid-level terms*. They are not themselves technical terms but are linked to a technical account, and they orient practitioners to a domain of behavioral functions. A model composed of mid-level terms provides the scaffolding for the development of treatment interventions while linking a practitioner-friendly account to basic behavioral science.

Psychological Flexibility Model

The psychological flexibility model serves as the unifying conceptual system for ACT at an applied level. It is based on six key processes—defusion, acceptance, present moment, self-processes targeting the repertoire-narrowing effects of verbal events, values, and commitment—that are behavioral activation processes (see Figure 18.1). In what follows, we provide a review of these processes and highlight how the implications of RFT form a coherent model of psychopathology and intervention. We provide a case example to summarize how these processes are applied in therapy. We reserve empirical evaluation of each of these components of ACT for the section that follows.

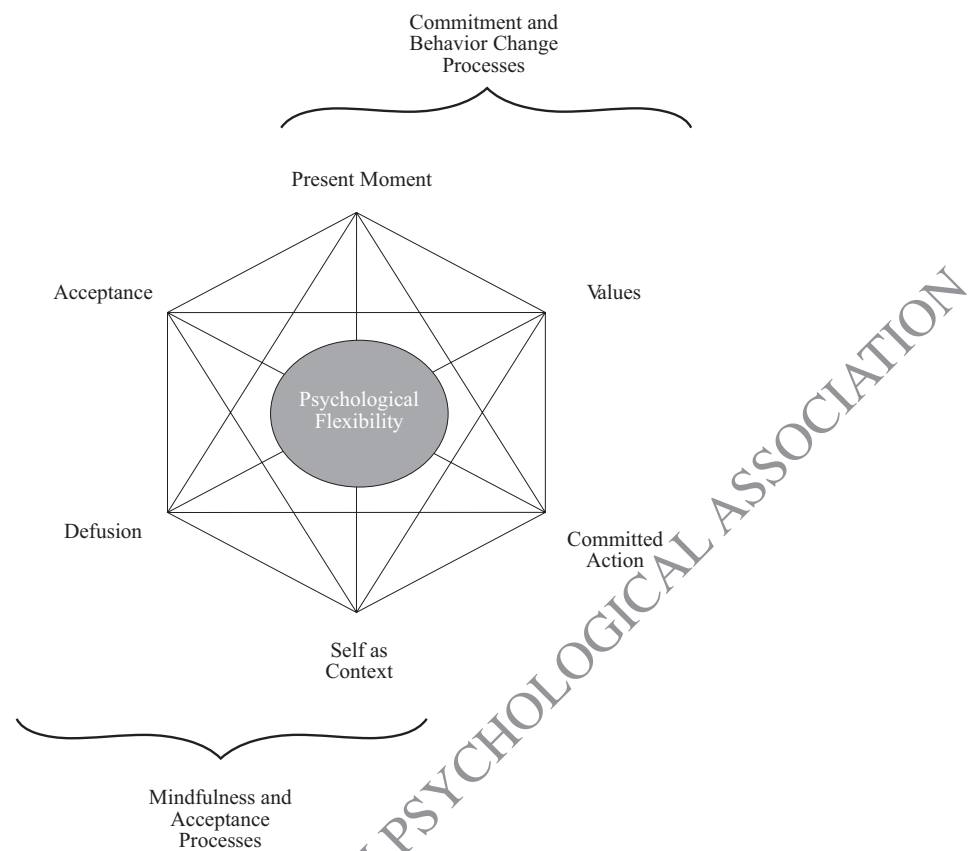


FIGURE 18.1. The acceptance and commitment therapy intervention model.

Defusion. Defusion interventions seek to reverse the harmful effects of cognitive fusion (see Fusion and Rule Governance section) by attempting to reduce the literal, evaluative functions of language. This reversal is accomplished by manipulating the functional contexts that control the transformation of stimulus functions produced through relational frames. In the client's daily life, the functional context is one in which evaluative statements are literally true. The ACT therapist seeks to disrupt this context so that thoughts are regarded as behavior (e.g., "I'm talking to myself about being worthless") instead of accurate descriptions of the world (e.g., "I really am worthless"). In other words, the emphasis is shifted from the products of verbal behavior (i.e., literal functions of verbal stimuli) to the process of verbal behavior, which differs from traditional cognitive therapies that seek to alter the content or frequency of verbal behavior (Beck, 1976). At the end of a successful defusion intervention, the form of verbal behavior may be unchanged (i.e., the client

will still have thoughts of worthlessness), but the impact of these private stimuli will be significantly altered.

Defusion interventions do not seek to completely disrupt the literal functions of language; doing so would leave the client unable to function in human society. Instead, these interventions seek to bring relational responding under more flexible contextual control. Clients learn to engage with the verbal products of language insofar as they are helpful while being able to disengage from this process and remain sensitive to other stimuli in the environment as indicated, supporting more flexible behavioral repertoires.

One defusion intervention technique involves undermining contexts that support the literal functions of language, such as the therapist responding to clients' statements as though they are true and valid or, alternatively, need to be argued against and changed. Therapists may not respond to clients' explanations for events as actual justifications for

behavior or as coherent stories. Instead, a therapist may repeatedly ask “Why?” to highlight the ultimately arbitrary nature of reasons or simply state “Thank your mind for that thought.” Similarly, rather than focusing on the content of a story, therapists may comment on the process of fusion with literal functions of language, such as by saying, “It sounds as though your mind is really trying to figure this out.” Other exercises involve engaging in behaviors that directly contradict one’s thoughts, such as walking around the room while saying “I can’t walk.”

Interventions may seek to establish contexts that highlight the direct stimulus functions of language. For example, a client may be prompted to say a difficult thought in a funny voice, sing it, repeat it over and over again, or write it down. These acts serve to highlight direct stimulus functions of verbal behavior such as the sound of the words rather than their derived functions.

Acceptance. Acceptance interventions involve altering the repertoire-narrowing effects of experiential avoidance by establishing an alternative context in which difficult private events are actively experienced as part of a pattern of valued actions. The ACT therapist manipulates the context to disrupt the functional relation between avoidant behavior and the termination or prevention of aversive private events. In the modified context, the client is encouraged to experience the private events without attempting to control their occurrence. This acceptance process seeks to increase contact with the direct stimulus functions of private events while disrupting their verbally derived (e.g., mutually entailed) functions. Thus, acceptance interventions overlap and interact with defusion interventions. For example, clients learn to accept that they are having a thought such as “I am worthless” (i.e., *thought* is a verbal descriptor of the antecedent private event) without buying into the content of the thought (i.e., saying “I am worthless” does not entail that the client is, in fact, worthless). This aspect of acceptance serves to avoid similar ineffective, narrow patterns of behavior that may occur when the client surrenders to or wallows in private events. Instead, acceptance interventions seek to develop

broad, flexible behavioral repertoires while the client remains in contact with difficult private events.

Acceptance is not the same as temporarily tolerating aversive experiences or setting a limit to what one is willing to experience. Engaging in experiential avoidance after a private event becomes too distressing may serve to maintain the avoidant functions of these private events. Rather, acceptance involves a full, active embrace of private events, no matter how distressing or how strong the urges are to avoid, dissociate, or otherwise control their occurrence. Acceptance also does not involve intentionally seeking to evoke distressing private events for their own sake. Rather, it is a process of embracing the private events that naturally occur as a result of the client’s history and current context. In particular, acceptance interventions target the difficult private events that can sometimes act as barriers to engaging in valued actions. Often, the most important parts of an individual’s life are also those that can evoke the most distressing thoughts, memories, emotions, and urges. It is precisely because one values a set of reinforcers that their potential loss is so painful. Acceptance is thus targeted in service of engaging in a valued life rather than just for the sake of acceptance in its own right.

Given that clients often have a long history of engaging in experiential avoidance, therapy typically includes spending a significant amount of time guiding clients to notice various behaviors that serve an experiential avoidant function and to examine the workability of this approach, both in terms of reducing the aversive private events and of living the life they want to live. One method of achieving this is creative hopelessness, which begins with the counselor compassionately guiding clients to describe the various ways they tried to solve their problem (e.g., anxiety, depression, worry, unwanted thoughts, urges or cravings to use substances). In the process, a range of experiential avoidance strategies are often identified and found to be not working in relation to the client’s goals. Similarly, the client’s behaviors in session, such as asking the therapist whether he or she has a suggestion for something different, can be identified and explored as other ways the client has tried to solve the problem and found it has not worked. This intervention seeks to leave clients in a

place in which they feel hopeless about the approach they have taken to solving their problem (i.e., experiential avoidance), but in such a way that they feel supported, curious, and open to what is to come in therapy. This intervention serves to establish a framework in which acceptance can be explored as a viable alternative to experiential avoidance.

As a functional process, any intervention technique can be used that establishes a context in which difficult private events are intentionally experienced without engaging in control strategies. Traditional exposure technologies are sometimes useful in this regard, although less effort is directed toward reducing client distress. Instead, the ACT therapist will help the client to establish a broader, more flexible behavioral repertoire while remaining in contact with the difficult private events. This broader repertoire may include being sensitive and able to shift attention to other stimuli in the environment besides the aversive private event and engaging in behaviors independent of whether they increase or decrease the occurrence of the private event. During acceptance interventions, the client is encouraged to interact with a thought, feeling, or sensation in a variety of ways without trying to control it, such as by engaging in suppression, avoidance, or cognitive reappraisal.

Present moment. Contact with the present moment is encouraged in ACT as a means of increasing the probability that the client's behavior will be influenced by a broader range of stimuli and contingencies while reducing the dominance of verbal functions over behavior. Cognitive fusion with a verbally constructed past or future serves to reduce contact with events occurring in the present, which can contribute to ineffective and destructive patterns of behavior that are insensitive to stimuli and consequences occurring in the environment because derived stimulus functions may overwhelm the clients' capacity to contact these other important sources of behavioral control. A goal of ACT is to assist the client in achieving a continuous, nonjudgmental awareness of internal and external events that can serve to support more flexible, effective patterns of behavior.

In particular, interventions seek to establish a flexible, yet focused attention to events occurring in

the present moment. Flexible attention to events in the moment without focus is less effective because it is equivalent to being easily distracted. Alternatively, focused but inflexible attention can be similarly problematic and may manifest as hypermonitoring of physical sensations or other particular cues in the environment. Rather, present-moment interventions seek to support a focus on important stimuli in the environment, yet one that can shift as necessary to support flexible behavioral repertoires.

Interventions may target present-moment contact by shaping the use of language to simply describe the direct properties of stimuli, particularly private events, rather than verbally derived features such as evaluations and predictions. Therapists may also help clients to notice the workability of patterns of behavior as a means of enhancing contact with direct contingencies. Rigid patterns of attention, such as to potential evaluations from others or to particular physical sensations, may be identified and directly targeted for change. Present-moment contact is often targeted in the context of the therapeutic relationship (Wilson & Dufrene, 2009). However, more structured interventions such as contemplative mindfulness meditation practices (e.g., breathing mindfulness) may also be used.

Self-as-context. *Self-as-context* refers to a sense of self as a perspective or observer, experientially distinct from the content of experiences. The term *context* refers to the notion that the discrimination of one's own behavior as organisms, and thus one's self (Skinner, 1974), is bound to historical and current circumstances and not solely to momentary private experiences. ACT therapists aim to foster this sense of self by providing multiple exemplars of deictic relational cues, resulting in a more contextualized self. For example, the client may be asked to attend to the historical or current course of his or her thoughts and emotions (i.e., multiple exemplars of "How did you feel then and there?" "How do you feel here and now?" "How will you feel there and then?"), noticing that across their constant fluctuations there has always been an invariant, which is the perspective or point of view of a speaker or listener. This expansion of self-awareness and the discrimination of this more stable sense of self provide

a more adequate contextual control over the transformation of functions of derived entailments possibly occurring at any given moment. The result is an experience of self as unchanging and independent from one's momentary self-conceptualizations and emotions. In that way, a given thought or emotion does not take control over an individual's behavior; instead, the thought or emotion is experienced within a much larger context. In other words, the individual takes a newer perspective with regard to his or her own private events.

Self-as-context can empower the other ACT processes. Often, the distinction between private events and one's larger sense of self are unclear. Approaching distressing emotions in an accepting manner can be difficult without drawing a distinction between a more contextualized sense of self and the emotion. Without this distinction, the emotion can be experienced as more threatening. Clients may describe themselves as lost in the emotion because they are unable to discriminate the emotion from other aspects of experience. Clients may also become fused with a more narrowly constructed sense of self, seeing their thoughts and feelings as who they are. Increasing contact with a sense of self-as-context can support defusion by highlighting the distinction between self and thoughts and reducing attachment to a conceptualized self.

Interventions typically seek to establish a sense of self-as-context through deictic manipulations. Experiential exercises may focus on discriminating a contextualized sense of self as distinct from momentary private events. They often highlight noticing the perspective from which other experiences are observed. For example, attention may be shifted to various thoughts, feelings, and sensations, noting how each is distinct from the perspective from which they are noticed. These exercises may include complex perspective-taking manipulations that integrate manipulations of the deictic frames I–you, here–there, and now–then. A flexible deictic framing repertoire is developed to assist in abstracting a more complex sense of I–here–now.

Values. *Values* refer to chosen, desired qualities of action that can be continuously instantiated in ongoing patterns of behavior and are never

completed as a distinct goal. These verbal constructions function as both formal and motivational augmentals, establishing and enhancing the reinforcing properties of temporally extended patterns of behavior (see Volume 1, Chapter 20, this handbook), providing a positive reinforcing counterpart to the dominance of aversive control produced through language processes. The relevant qualities of ongoing behavior can be abstracted and related to chosen values, augmenting or establishing their reinforcing properties. Behavior can thus be brought partially under the control of verbally constructed consequences, increasing the capacity to engage in behavior despite aversive consequences in the moment.

Values-consistent behavior is a form of rule-governed behavior. However, because these rules specify abstract qualities rather than specific behaviors and are not reliant on a particular outcome, they tend to support more flexible behavioral repertoires than other forms of rule-governed behavior. The flexibility and reinforcement provided with values tends to produce behavior that is likely to be maintained over time.

Values establish the motivational context for the other ACT processes, providing a direction for intervention. Patterns of behavior are generally evaluated in terms of their workability in relation to one's values. Processes such as acceptance and defusion are applied insofar as they support values-consistent action. Similarly, processes that act as barriers to values, such as experiential avoidance, can be targeted in this context.

Techniques are used to assist in clarifying clients' values when relevant. Valued qualities of action may be explored in specific life domains, and clients may be instructed to track patterns of behavior that they regard as valuable to assist in abstracting chosen values. Interventions also seek to identify and disrupt verbal processes that support avoidance, pliance (rule-governed behavior mediated by social reinforcement for coordination between behavior and rule), and fusion. For example, a client may indicate that he or she values avoiding private events ("I value feeling comfortable") or complying with the wishes of others ("I should value helping others because my parents want me to"). These forms of rule-governed behavior are primarily under aversive

control or arbitrary social contingencies and are likely to be rigid and ineffective. Treatment thus seeks to undermine these processes while clarifying chosen values.

Committed action. Committed action involves the process of building larger and larger patterns of effective action linked to chosen values while breaking ineffective patterns. This process integrates direct contingency analysis and is similar to traditional behavioral interventions. The direct contingencies that play a role in these behavioral patterns are leveraged through interventions such as exposure, contingency management, goal setting, and skills training. Barriers related to verbal processes are targeted through the other ACT processes as relevant.

Psychological flexibility. Psychological flexibility is the ability to engage or disengage in behavior in the service of chosen values and to contact the present moment as a fully conscious being. It represents the culmination of the six aforementioned ACT processes and is the ultimate goal of treatment. Thus, as opposed to some other treatment approaches, the goal in ACT is not symptom reduction or alleviation of distress; it is building up effective patterns of action linked to chosen values, even when distress and symptoms occur.

Case Example

To further illustrate how these processes are applied to case conceptualization and treatment in ACT, we present a brief case example. The case example is a 40-year-old man, married with two children, who is presenting for therapy because of recurring panic attacks (1 to 3 times a week) that feel as though they are coming out of the blue. He describes these attacks as extremely frightening, that he feels as though he is going crazy and that he might die. In response to these panic attacks, he has been avoiding a range of activities and events that might lead to an attack. For example, he avoids crowded settings in which it might be difficult to leave if he has a panic attack and does not exercise because the increase in heart rate also makes him feel as though he might have an attack. Some of these avoidance strategies have been particularly costly. For example, he has not been to his children's performances in school

plays and music productions, and he has been getting increasingly out of shape. The client says he would like to find ways to get rid of his anxiety.

This case can be conceptualized using the core ACT processes reviewed in the preceding section. The client appears to rigidly engage in behaviors to avoid, escape, or otherwise control the thoughts, sensations, and feelings related to panic attacks. He is cognitively fused with evaluations and predictions related to his panic attacks (i.e., "I'm going to die," "I can't handle this") as well as ineffective rules such as "I cannot do something if it might lead to a panic attack" and "To do things I care about, I need to not feel anxious." The client is likely to be attentive to experiences in the present moment, but this attention may be somewhat inflexible at times, such that he hypermonitors his internal experiences for signs of a potential panic attack. This hypermonitoring for and evaluating antecedents of panic attacks further contributes to patterns of experiential avoidance, which has led to significant functional impairment, particularly in relation to engaging in valued actions (i.e., his relationship with his children), as well as increasing life dissatisfaction and clinical distress.

ACT is a flexible treatment approach, and the course of therapy could be structured in many ways depending on several factors, such as how the client responds to initial intervention attempts with a given process. In this case, given the particularly central focus of experiential avoidance in the client's case conceptualization, therapy might begin with creative hopelessness in an attempt to support the client in recognizing patterns of behavior that have been focused on controlling anxiety and the costs of this approach. Once the client demonstrates an awareness of engaging in experiential avoidance, its costs, and an openness to try something different, the therapist would introduce acceptance as an alternative. Before engaging in intensive acceptance exercises, therapy would work on developing his capacity to notice and defuse from thoughts related to panic, establishing more flexible present-moment awareness, and developing self-as-context.

One way these processes could be targeted is through mindfulness exercises. For example, the client might be asked to imagine a stream with leaves floating down it and to imagine placing each

thought he has on a leaf. This exercise would provide an experience of simply noticing his thoughts as thoughts rather than engaging in their specific content as well as noticing when he becomes cognitively fused with his thoughts rather than completing the exercise. Exercises may also involve his simply noticing experiences in the moment, while highlighting the distinction between what he notices and who is noticing to build on a sense of self-as-context.

Another key component for targeting acceptance, defusion, present-moment, and self-processes would be modeling, instigating, and reinforcing these processes within the context of the therapeutic relationship. Most forms of avoidance and fusion, on the one hand, or values-based actions, on the other, are linked to social processes such as being right, regulating impressions, or accomplishing social ends, which means that the relationship itself can be a vehicle for discriminating and shaping flexibility processes—a point that has rightly long been made in clinical behavior analysis by developers of functional analytic psychotherapy (Kohlenberg & Tsai, 1991; see Chapter 2, this volume). At the end of this portion of therapy, the client would demonstrate some capacity to flexibly attend to experiences, including aversive private events, in the present moment without engaging in experiential avoidance or becoming fused with literal functions of language and while distinguishing between these experiences and himself as the observer.

With this set of skills in place, therapy would then move toward supporting the client in identifying and engaging in valued actions, independent of whether aversive private events (particularly antecedents to panic attacks) are predicted to or actually occur. This would first involve supporting the client in clarifying and connecting with his values as a way to motivate and guide his actions, which would include a similar process of modeling, instigating, and reinforcing values talk within the context of the therapeutic relationship. Specific exercises such as reflecting on what he would want to have written on his tombstone may also be used. Therapy would then move to committed action, in which specific behavioral commitments could be identified that are linked to values and support acceptance of difficult private events. In this case, the client may begin by

completing exposure to antecedents related to panic attacks such as increasing his heart rate by going up the stairs with the therapist there to support a flexible, accepting, and defused stance toward his experiences. The client would be encouraged to identify and connect with how his behavioral commitments are linked to his values. These commitments would be expanded over time to completing activities in his everyday life that he has been avoiding and that are valued (i.e., going to a school play). Barriers to completing commitments, particularly internal barriers, would be identified and targeted through further acceptance, defusion, present-moment, self, and values interventions as indicated. Therapy would end when the client demonstrates significantly improved psychological flexibility, as evidenced by having built up patterns of valued activity in his life while having substantially reduced patterns of activity linked to avoidance and ineffective rules, particularly in relation to panic attacks.

A wide variety of evidence exists on the seven processes just mentioned—studies that link each to RFT (e.g., Villatte et al., 2008) or show their role in psychopathology or treatment (Hayes et al., 2006). We examine this evidence throughout the rest of the chapter.

Expanded Use of Methodologies to Test the Theoretical Model and Treatment Technology

CBS seeks to test treatment technologies, as well as the underlying theoretical model and basic principles, through a variety of methodologies, including group designs. This approach differs significantly from the traditional behavior-analytic approach to research. Behavior analysis has often been characterized by the predominant use of single-case time-series research methods. Although these methods provide many benefits in studying the behavior of individual organisms (e.g., an emphasis on establishing visually observable treatment effects), they are not appropriate for answering all questions faced by psychologists.

Of particular importance is that time-series designs do not test the relevance and general applicability of an analysis to a given population (although see Volume 1, Chapter 7, this handbook,

for an opposing view). Given that behavioral principles are applied at the level of the individual organism interacting in and with a context, testing their impact at the individual level is important as well. However, it does not directly inform an understanding of the degree to which a given functional analysis is generally applicable to a particular population, defined functionally or topographically. This question is of ultimate importance in scaling behavior-analytic analyses and interventions to deal with public health problems, which has been always been part of the strategy underlying behavior analysis. Failing to conduct this research has negative implications for the dissemination of behavior analysis as well as for increasing the knowledge base. CBS seeks to determine the generality of the theoretical model by testing the impact of treatment technologies at a group level as well as in time-series designs.

The tight link between treatment technologies, theoretical models, and basic principles allows for a test of the applicability of a functional analysis at a higher level of abstraction (i.e., across organisms and contexts). All forms of behavioral intervention are based on hypothesized or tested behavioral functions informing treatment. This testing must usually be done one person at a time because histories differ so widely. When dealing with functions that are dominantly established by language itself, however, a great deal of overlap can exist between people, and thus considerable commonality can be found in the functional interpretations that emerge. For example, the ACT model posits that processes such as experiential avoidance, fusion, and psychological inflexibility frequently play a critical role in the maintenance and exacerbation of chronic pain. The applicability of these functional processes to individuals with chronic pain has been tested in group studies, which have found that those who demonstrate higher acceptance and psychological flexibility in relation to pain tend to have better outcomes (McCracken & Eccleston, 2003, 2005). Furthermore, research has found that ACT interventions targeting these processes among adolescents with idiopathic chronic pain produced improvements, maintained after a 6-month period, in functional disability, pain intensity, pain interference, catastrophizing, and school attendance, compared with

participants in a wait-list control group (Wicksell, Melin, Lekander, & Olsson, 2009). The effects of ACT on chronic pain outcomes are accounted for by changes in psychological flexibility and its related processes (Wicksell, Olsson, & Hayes, 2011), and brief acceptance-only interventions can produce reductions in physical impairment (e.g., flexion, extension, active sit-up) in individuals with low-back chronic pain compared with wait-list control participants (Vowles et al., 2007). Overall, these various applications of group design methods test whether the abstracted functional analysis applies to a general, topographically defined population at multiple levels, which would be difficult to determine with a more rigid reliance on time-series designs alone.

Testing the components of acceptance and commitment therapy. Testing the independent and cumulative impact of treatment components is important. It can directly inform further refinement of a treatment package. Components found to be inactive can be modified or removed, and active components can be further enhanced and emphasized. In addition, treatment components in a CBS approach are tightly linked to the underlying processes of change specified in the theoretical model. Thus, examining the effects of treatment components provides important information regarding the theoretical model. If the model specifies a particular component as important for producing clinical gains but is found to have little impact, then the model needs to be corrected.

Often, treatment components are tested through large-scale dismantling studies in which the efficacy of a complete treatment package is compared with that of the treatment package with a particular set of components removed. This type of study provides a direct assessment of whether the treatment component is contributing to the efficacy of the intervention. However, these designs are also very time consuming and often only occur late in treatment development after multiple randomized controlled trials (RCTs) and dissemination have occurred. At this point, if a treatment component is found to be ineffective, it is much more problematic to modify the treatment approach accordingly.

CBS emphasizes the use of microcomponent studies as another potential method for testing

treatment components. These studies are typically small-scale, laboratory-based studies that test the impact of a brief intervention in a highly controlled setting on clinically relevant outcomes, which allows for a tighter control of the treatment components being tested. The treatment outcomes in these studies are more general, often using nonclinical populations and focusing on more broadly relevant features of behavior such as task persistence and recovery from mood inductions, thus providing a test of the treatment component more generally rather than in relation to a narrowly defined disorder. In addition, these studies are relatively cheap and easy to conduct, allowing for component testing to occur early and throughout treatment development without requiring substantial grant funding or time-consuming studies.

More than 40 component research studies have consistently supported the efficacy of treatment technologies targeting the specific processes of change in ACT (F. J. Ruiz, 2010). These studies have suggested that many of these components are psychologically active, as demonstrated by their impact on clinically relevant outcomes compared with inactive control conditions. For example, acceptance component interventions have been found to produce higher levels of persistence in distressing tasks (Levitt et al., 2004; Vowles et al., 2007) and willingness to engage in exposure (Eifert & Heffner, 2003). Defusion component interventions have been found to reduce the distress associated with and believability of negative self-relevant statements (Masuda, Hayes, Sackett, & Twohig, 2004; Masuda et al., 2008). Values component interventions have been found to produce higher levels of persistence in distressing tasks (Branstetter-Rost, Cushing, & Doulich, 2009; Páez-Blarrina et al., 2008), reduce distress from stressful tasks (Creswell et al., 2005), improve grades in minority students (Cohen et al., 2009), and improve responsiveness to health messages (Harris & Napper, 2005). Overall, this evidence supports the independent impact of acceptance, values, and defusion on clinically relevant outcomes.

Research has not yet tested the independent impact of self-as-context and contact-with-the-present-moment components on clinically relevant

outcomes compared with inactive conditions in microcomponent studies. However, research has been conducted that provides some support for the utility of these components. Within the sensate focus literature, studies have found that brief, present-moment awareness interventions can sometimes produce higher levels of persistence and less pain or discomfort in distressing tasks than interventions such as distraction and suppression (Cioffi & Holloway, 1993; Michael & Burns, 2004). In addition, a recent small dismantling study compared the impact of a complete ACT treatment with a treatment without the self-as-context component in a population of veterans diagnosed with posttraumatic stress disorder (Williams, 2006). Participants in the complete ACT intervention experienced significantly greater decreases in posttraumatic stress disorder symptoms at follow-up than participants in the ACT without self-as-context intervention, suggesting the importance of this component for treatment.

Studies have also compared specific combinations of ACT components with inactive control conditions. Interventions that combine aspects of the mindfulness components of ACT (acceptance, defusion, self-as-context, and present moment) have been found to reduce reactivity to distressing tasks (Hayes, Bissett, et al., 1999; Masedo & Esteve, 2007) and increase persistence in tasks (Masedo & Esteve) compared with nonintervention control conditions. Studies have also found similar outcomes when combining mindfulness components and values (Gutiérrez, Luciano, Rodríguez, & Fink, 2004; McMullen et al., 2008; Páez-Blarrina et al., 2008).

Component studies also provide the opportunity to test important features of the theoretical model. The outcomes that tend to be affected more by ACT components are consistent with theoretical predictions. Studies have consistently demonstrated that ACT components have an impact on task persistence, willingness, and believability of thoughts. However, findings are much less consistent regarding the impact on the frequency and intensity of distressing thoughts, feelings, and sensations, with some studies showing a positive impact with ACT components (Masedo & Esteve, 2007; Masuda et al., 2004) and others finding no impact (Branstetter-Rost et al., 2009; McMullen et al., 2008;

Páez-Blarrina et al., 2008). This trend in studies supports the ACT model in which interventions seek to change the function of thoughts, feelings, and sensations in relation to overt behavior, whereas changes in their frequency, form, or intensity are more secondary and not explicitly targeted. Studies have also found that ACT components produce much higher rates of persistence when one experiences high levels of pain and discomfort than do inactive and suppression or distraction intervention conditions (Gutiérrez et al., 2004; McMullen et al., 2008; Páez-Blarrina et al., 2008). This desynchrony effect in which the relationship between pain and overt behavior is disrupted is consistent with the prediction that ACT works by changing the function of private events rather than their form or intensity.

Testing processes of change. Another important feature of treatment testing is to examine the processes through which treatment produces an effect. This feature provides a strong test of the theoretical model and has implications for further treatment development. Mediation analysis in particular is a useful way to test the processes of change in an intervention (Kazdin, 2007). Mediation analysis examines several factors (see Figure 18.2) including whether treatment affects the process of change (path a between treatment and mediating process), whether the process of change is related to the behavioral outcome after controlling for treatment (path b between mediator and outcome), and whether paths a and b account for the effect of treatment on outcome (i.e., leaving little or no variance to be accounted for by path c' between treatment and outcome). Each of these tests provides

important information regarding the theoretical model and intervention.

Path a tests whether treatment affects the specified processes of change more than a comparison condition. This comparison tests whether the treatment, compared with an inactive intervention, affects the process of change, controlling for non-intervention-related confounds. If a treatment is unsuccessful in affecting the processes of change, it suggests either a failure of the technology or a failure of the model in specifying a manipulable process, assuming the process-of-change measure is reliable and valid in the given context. A more stringent test is conducted when a similar, active treatment is used because it tests the specificity of the treatment approach in targeting the processes of change. If the treatment does not produce a differential impact on the processes of change, it suggests that the theoretical model is not specific to that treatment approach and accounts for a more general feature of intervention.

Path b tests whether a process of change is related to a clinical outcome when controlling for the impact of treatment. It provides a stringent test of the applicability of the process to the clinical problem of interest. To detect a significant effect, the variations in the process have to be related to outcomes in both treatment groups, and relatively consistently. Thus, path b can provide support for the model of psychopathology by examining whether particular processes predict behavioral outcomes.

The path c' directly assesses whether the observed effect of treatment on clinical outcomes is accounted for by its impact on a particular process of change. This analysis is a central component of

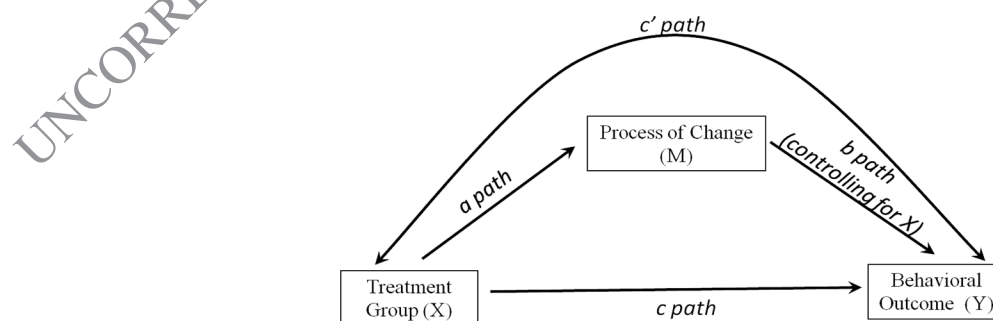


FIGURE 18.2. Mediation analysis model.

testing the theoretical model because it tests whether the theory accurately specifies how the treatment affects clinical outcomes. It provides very strong support for a theoretical model, especially if the result is consistently replicated.

ACT outcome studies have generally included an explicit focus on examining processes of change. Measures have been developed to assess these theoretical processes and have been included in almost every outcome study conducted. Studies have consistently found that ACT affects the theoretically specified processes of change and that changes in these processes predict changes in outcomes (Hayes et al., 2006). In addition, formal mediational analysis has been conducted in at least 21 RCTs (Levin, Hayes, & Vilaradaga, 2008). These studies have consistently found that the differential impact of ACT on clinical outcomes is mediated by changes in acceptance and psychological flexibility (Gifford et al., 2004; Gregg, Callaghan, Hayes, & Glenn-Lawson, 2007; Lundgren, Dahl, & Hayes, 2008; Lappalainen et al., 2007), defusion (Hayes et al., 2004; Zettle & Hayes, 1986; Zettle, Rains, & Hayes, in press), mindfulness (Lazarone et al., 2007), and values (Lundgren et al., 2008). Successful mediation has been demonstrated in ACT RCTs across a broad range of clinical populations, including depression, psychosis, anxiety, chronic pain, self-harm, smoking, burnout, weight loss or maintenance, chronic illness, self-stigma and stigma toward others, and adopting evidence-based treatments (Levin et al., 2008). Furthermore, these mediational effects were demonstrated even when compared with structured interventions such as pharmacotherapy (Gifford et al., 2004), multidisciplinary care (Wicksell et al., 2009), and cognitive-behavioral therapy (Zettle & Hayes, 1986; Zettle et al., in press).

These effects provide strong support for the ACT theoretical model. This level of consistency in mediational analysis is rarely achieved, particularly when one considers the range of mediational measures, clinical populations, and comparison conditions included. Demonstrating mediation across such a broad scope of problems suggests that these processes apply across a significant range of problems and that ACT can affect these areas through the theoretically specified processes of change. In

addition, studies demonstrating mediation with active comparison conditions highlight ACT's specificity in targeting these processes of change. If pharmacotherapy and cognitive-behavioral therapy were equally as efficacious in affecting processes such as defusion and acceptance, it would raise concerns regarding whether the ACT approach is unique. The ability for ACT to have more of an impact on these processes than other empirically supported therapies suggests this approach is different, and one that is quite effective given the broad applicability of these processes to a range of clinical problems.

Testing the applicability of the model across a broad range of outcomes. Another way to test the applicability of the model is to examine it across a range of diverse populations that share a similar functional diagnostic dimension. This test can be done by conducting a series of outcome studies for a broad range of problems using a treatment that targets a similar underlying set of processes. If positive effects are consistently observed, it provides strong support for the scope of the analysis in identifying important functional variables for intervention. In addition, the limits of the theoretical model and intervention are identified much more quickly in this expansive approach to treatment testing, providing information regarding important areas for further research.

ACT has been tested across a very broad range of problem areas. Outcome studies, including RCTs, open trials, and time-series designs, have found positive effects for ACT in several different areas including depression, anxiety, psychosis, chronic pain, substance use, smoking, coping with chronic illness, weight loss or maintenance, burnout, self-stigma, stigma toward others, sports performance, and learning other treatment approaches (Hayes et al., 2006; Hayes et al., in press; F. J. Ruiz, 2010). These findings lend support to the theoretical model by demonstrating the broad applicability of the ACT model and treatment technology. Processes such as experiential avoidance, fusion, and psychological inflexibility appear to be important functional variables across many topographically distinct problems and can be affected by targeting processes such as

acceptance, defusion, and psychological flexibility. In addition, some of these problems are quite difficult to treat or represent new areas of application for psychotherapy such as epilepsy (Lundgren et al., 2008), obesity (Lillis, Hayes, Bunting, & Masuda, 2009), and stigma (Hayes et al., 2004).

ACT's efficacy has been supported by these outcome studies. Hayes et al. (2006) conducted a meta-analysis of 17 ACT RCTs, including unpublished studies, estimating a medium Cohen's *d* effect size of 0.66 on primary outcomes at posttest and follow-up. A meta-analysis by Öst (2008) of 13 published ACT RCTs found similar results, estimating a medium Hedge's *g* effect size of .68 on primary outcomes at posttest. Another meta-analysis by Powers, Vörding, and Emmelkamp (2009) of 18 published ACT RCTs found a slightly lower effect size, estimating a medium Hedge's *g* effect size of .42 for disorder-specific symptoms and of .59 for general distress and impairment or disability combining posttest and follow-up. These meta-analyses, two of which were conducted by non-ACT researchers, indicated the active impact of ACT on clinical outcomes across a range of problem areas.

Effectiveness, Dissemination, and Training Research

Treatment outcome research within clinical psychology has typically taken a stage-based approach in which studies testing the effectiveness and dissemination of treatments do not occur until the final stage of treatment testing. However, determining the effectiveness of interventions with everyday clinicians and treatment settings for more heterogeneous clients is crucial because it is how treatments are generally applied. Taking an active role in studying how best to disseminate and train clinicians in the effective implementation of the intervention package is an important task for researchers. The observed lack of adoption of evidence-based treatments by clinicians (Sanderson, 2002) may be attributed to researchers' inattention to dissemination and training factors.

CBS involves active attention to effectiveness, dissemination, and training research. Relative to the standard treatment development process (Rounsaville, Carroll, & Onken, 2001), these studies are

conducted early on to determine how best to train clinicians in the intervention approach and whether it may produce improved clinical outcomes with typically seen clients. The first ACT outcome study after RFT was developed was an effectiveness study (Strosahl, Hayes, Bergan, & Romano, 1998) that found that line clinicians randomized to training in ACT produced significantly better outcomes among outpatient clients than those who were not assigned to the training. Since then, two additional effectiveness studies have found that novice-level clinicians trained in ACT have produced equivalent (Forman, Herbert, Moitra, Yeomans, & Geller, 2007) or better outcomes (Lappalainen et al., 2007) with heterogeneous clinical populations than did those trained in cognitive-behavioral therapy. In addition, many of the published ACT outcome studies have included more heterogeneous populations than those typically treated in RCTs. For example, Bach and Hayes (2002) included individuals with comorbid substance use, other psychological disorders, or both in a psychosis outcome study and found a similar reduction in rehospitalization rates as with treatment as usual among those with and without comorbid disorders. This and similar findings (e.g., Bond & Bunce, 2000; Forman et al., 2007; Twohig et al., 2010) provide further support for the applicability of ACT to real-world clinical populations. These studies have provided initial evidence suggesting that everyday line clinicians can be trained in ACT to produce improved outcomes with the clients they typically serve.

SUMMARY AND CONCLUSIONS

Whether behavior analysis can engage the range of challenges facing humanity today remains a question. Behavior analysis has provided insight into the variables controlling the human activities responsible for these challenges and has offered some solutions that have proven useful (consider Chapters 1, 3, 10, and 19 of this volume). However, any reasonable observer would have concerns about behavior analysts' ability to affect change. Skinner himself apparently reached a point of pessimism later in life when faced with the lack of an impact of behavioral science on global problems (Chance, 2007).

From an ACT–RFT perspective, behavior analysts have often greatly underemphasized the role of verbal behavior in these problems and their possible solutions. In the absence of a powerful approach to language and cognition, behavior analysts were left with no alternative but to focus primarily on direct contingency analyses. When doing so, however, the excessive impact of immediate consequences over delayed consequences can seem impossible to avoid. In contrast, ACT–RFT research has suggested that language itself can help diminish that problem by altering how delayed consequences are contacted (e.g., Dixon & Holton, 2009). The impact of aversive control can be impossible to alter, but acceptance and mindfulness are now known to considerably alter the excessive impact of aversive control (McMullen et al., 2008). The susceptibility to short-term reinforcing effects of sugar, drugs, alcohol, and other chemicals can seem unavoidable, even though researchers are learning how to diminish regulation by such stimuli (e.g., Hayes et al., 2004; Lillis et al., 2009)

The ACT–RFT approach rests on the hypothesis that verbal behavior plays a critical role in the development, maintenance, and exacerbation of many of these problems as well as in their potential alleviation. Careful consideration of ways to counteract the harmful effects of verbal behavior is important as is that of how to use verbal behavior to support more effective behaviors. Although Skinner's (1948) analysis provided an initial foundation for a behavior-analytic approach to verbal behavior, it has its limitations (Hayes & Hayes, 1992). RFT builds on Skinner's account and may serve to further a functional understanding of verbal behavior, highlighting particular important features of language and cognition such as the ability to derive relations and the transformation of stimulus functions produced through relational framing. This has led to the development of ACT as an applied theoretical model of intervention, pathology, and health that seeks to reduce the harmful behavior-regulatory effects of verbal behavior, particularly the repertoire-narrowing processes of fusion and experiential avoidance, while simultaneously leveraging verbal processes to produce broader, more effective patterns of behavior linked to chosen values. These developments point

to a potential path for furthering the capacity of behavior analysis to meet the significant problems humans are encountering.

Developing a comprehensive science of behavior presents significant challenges. Beyond the specific theoretical and technological developments, the ACT–RFT research program reflects an alternative scientific strategy within behavior analysis, CBS, that may serve to vitalize and empower the field in meeting its broad vision. In this chapter, we have reviewed ACT, but we have done so in the context of explicating the elements of a CBS approach as a translational and knowledge development strategy. CBS orients to a more clearly explicated set of philosophical assumptions underlying the scientific approach, which emphasizes truth based on achieving the goals of the research program: prediction and influence of behavior with precision, scope, and depth. Basic research and applied research need to be brought together by focusing on areas of shared interest in which work on each level informs work on the others. Mid-level terms are used to support the application of principles and technical terms to the prediction and influence of behavior in particular domains, providing a framework for interventions and enhancing the capacity to test theoretical models in a reticulated fashion. Finally, a diverse set of research methods are used to test the technology and underlying theoretical model, including examining the effects of specific treatment components, efficacy across a broad set of populations, mediation and moderation analyses, effectiveness of treatment in real-world clinical settings, and evaluations of training and dissemination techniques.

Taken together, our hope is that these developments help move behavior analysis back toward central concerns in psychology. A rise in the popularity and impact of ACT and RFT, which is easy to demonstrate objectively (e.g., see <http://www.contextualpsychology.org>), is evidence that it is occurring. Just as important, they also move behavior analysis back toward its original expansive vision. The needs of human beings demand nothing less.

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