DISRUPTING VERBAL PROCESSES: COGNITIVE DEFUSION IN ACCEPTANCE AND COMMITMENT THERAPY AND OTHER MINDFULNESS-BASED PSYCHOTHERAPIES

JOHN T. BLACKLEDGE
University of Wollongong, Australia

Applied behavioral psychology pivots on the formation and alteration of stimulus function: on how stimuli come to differentially affect behavior and how these effects can be altered when they prove problematic. Relational frame theory (RFT) offers an account of how uniquely verbal processes transform stimulus functions. Acceptance and commitment therapy (ACT) was designed to counteract problematic verbal transformations of function, in part through the use of cognitive defusion techniques. But the construct of cognitive defusion remains incompletely understood. The current article comprises an attempt to explore parameters around the ways in which cognitive defusion are viewed and operationalized within ACT and RFT. A comprehensive RFT-based conceptualization of defusion is offered, and hypotheses about the nature of defusion and its effects are discussed, with the intent of spurring more focused empirical exploration on the characteristics and effects of defusion inside ACT and in a variety of mindfulness-based psychotherapeutic treatments.

The notion of "stimulus function" has been a central characteristic of behavioral psychology since relatively early on. Kantor (1938) noted a distinction between a stimulus object and stimulus function, with the latter referring to the effect a stimulus has on a subsequent response. Kantor noted both that the same stimulus object could have different functions (i.e., lead to different kinds of responses) and that different stimulus objects demonstrate the same function when they are followed by functionally similar responses. Skinner (1938/1991; pp. 232–262) wrote an entire chapter about the notion that stimuli can serve a variety of functions (e.g., elicitation, discrimination, reinforcement) regardless of form, and emphasized the centrality of functional analysis throughout his career. The notion of stimulus function points directly to both the primary importance of the functional class in behaviorism and to behaviorism's pragmatic focus on stimuli that actually elicit or evoke subsequent responses.

    While not traditionally discussed with this terminology, operant and respondent conditioning can be said to result in *transformations* of stimulus function. In the case of respondent conditioning, when a previously neutral stimulus is presented before an unconditioned stimulus, this pairing results in a transformation of the first stimulus's function such that it now elicits the same response as the second stimulus. Pavlov's (1927) classic experiment in which the sound of a bell, reliably presented before food, came to elicit the same salivation response as food exemplifies this notion perfectly. The effects of operant conditioning may also be described as involving transformations of stimulus function. When a three-term contingency is established, for example, the discriminative stimulus takes on an eliciting function with respect to the subsequent response. The response itself (which may later become a stimulus for further responding) may take on the reinforcing function of the consequence that follows. The process of operant conditioning essentially involves a transformation of stimulus functions that occurs according to how these stimuli with various prior functions become interrelated.

    Skinner spoke extensively about the way in which direct contingency processes such as operant and respondent conditioning can lead to dramatic changes in stimulus function. He argued that direct operant processes applied equally to verbal and nonverbal behavior (Skinner, 1957). More recently, some behavioral psychologists (e.g., Hayes, Blackledge, & Barnes-Holmes, 2001) have argued both theoretically and empirically that Skinner's treatment of verbal behavior has proven inadequate. Relational frame theory (RFT; see, for example, Hayes, Barnes-Holmes, & Roche, 2001) is based on the empirically supported assumption that unique verbal learning processes may be largely responsible for many of the functions verbal stimuli come to demonstrate. In other words, RFT describes how uniquely verbal processes result in the transformation of function for stimuli these processes are brought to bear upon.

    Given the rather consistently pragmatic focus of radical behaviorism (e.g., Hayes, 1993), it should not be surprising that RFT's positing of verbal sources of functional transformation can be explicitly linked to interventions designed to alter or disrupt these transformations of function when they prove problematic. A signature example is the notion of *cognitive defusion*, a process central to acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 1999). From an ACT-RFT perspective, verbal processes are both a boon and a bane for human beings in general, allowing us to organize our behavior in highly sophisticated manners on the one hand and to become entrapped by debilitating negative self-evaluations and overly rigid verbal rules on the other. In other words, verbal processes can make the world of direct (nonverbal) contingencies far more aversive than it needs to be. To quote Shakespeare, "there is nothing either good or bad but thinking makes it so" (*Hamlet*). Cognitive psychologists have embraced this notion in some form since the beginning and have devised a broad armamentarium of

cognitive restructuring techniques designed to change thoughts with the intent of changing one's experience of the world. Behavioral psychologists have been highly reluctant to embrace this possibility, perhaps largely because of the inherent risk of assigning causal status to private events (though a careful reading of the previously cited RFT reference will indicate how this pitfall can be avoided).

Unlike a host of cognitive restructuring methods inherent to cognitive psychology, defusion techniques are not intended to *change* the way people think about their experience. Rather, they are meant to disrupt the uniquely verbal processes that give rise to these problematic transformations of function in the first place. From such a perspective, it may be assumed that conditions which give rise to the antithesis of cognitive defusion—cognitive *fusion*—are the same conditions which allow verbal processes that result in verbal transformations of stimulus function. In other words, cognitive *fusion* refers to contexts in which verbal transformations of function are readily occurring, while cognitive *defusion* refers to contexts in which these verbal transformations are at least temporarily disrupted. Latter portions of this article will expand markedly on these points.

Within ACT, defusion techniques involve a variety of actions designed to expose thoughts simply as thoughts rather than binding realities. Paradox, mindfulness, cognitive distancing, and a variety of other strategies are used to help clients experience problematic thoughts in a new context—one where the debilitating *functions* of such thoughts are disrupted even when the *form* (or content) of these thoughts remains the same. Whereas traditional behavioral methods such as exposure and response prevention address problematic stimulus functions that arise through direct (nonverbal) contingency processes such as respondent and operant conditioning, cognitive defusion techniques address problematic stimulus functions that arise through indirect (verbal) processes, as defined by RFT (discussed below). As might be guessed from the brief description of ACT defusion techniques above, defusion may well be an active component of many modern psychotherapeutic treatments, not just mindfulness-based treatments such as dialectical behavior therapy (Linehan, 1993) and mindfulness-based cognitive therapy for depression (Segal, Teasdale, & Williams, 2001) but also mainstream cognitive behavioral therapy, the founder of which, Aaron Beck, recommended use of cognitive distancing strategies that first involve "stepping back" from dysfunctional thoughts and noticing them as beliefs rather than simply as facts (Beck, 1970; Hollon & Beck, 1979). To the extent that defusion processes are present (or could be made more substantial, if empirically warranted) in such treatments, the construct of cognitive defusion rises from being critically important in ACT to being of marked importance to psychotherapy in general.

While the foregoing colloquial description of defusion may have intuitive appeal, such appeal does not form a solid foundation for scientific progress. Evidence on the effects of defusion and ACT in general have

strongly suggested that a rigorous scientific treatment of defusion is now warranted. In addition to a variety of outcome studies that showed the positive effects of defusion-laden ACT therapy (see, for example, Hayes, Masuda, Bissett, Luoma, & Guerrero, 2004, for a moderately up-to-date summary of ACT research), recent empirical research on the beneficial effects of specific cognitive defusion techniques indicate a variety of therapeutically desirable results (Masuda, Hayes, Sackett, & Twohig, 2004; Melia, Roche, & Blackledge, 2006; Healy, Barnes-Holmes, Barnes-Holmes, Wilson, Luciano, & Keogh, 2006; Keogh & Barnes-Holmes, 2006). The remainder of this article thus involves an overview and technical conceptualization of cognitive defusion, with the primary intent of advancing a more focused basic experimental and applied investigation of the process.

Existing Treatments of Cognitive Defusion

Two preliminary conceptualizations of cognitive defusion have been advanced. When defusion was still referred to by the functionally identical term *deliteralization*,[1] Hayes et al (1999) defined it as "disrupt[ing] ordinary meaning functions of language such that the ongoing process of framing events relationally is evident in the moment and competes with the stimulus products of relational activity" (p. 74). Further, they added that defusion "breaks down the tight equivalence classes and dominant verbal relations that establish stimulus functions through verbal means" (p. 74). This definition draws copiously on processes at the core of RFT, the basic experimental backdrop for ACT (Hayes, Barnes-Holmes, & Roche, 2001; see also Blackledge, 2003, for a brief introduction).

For those unfamiliar with RFT, a brief explanation of the processes referred to in this definition is necessary. From an RFT perspective, stimuli may take on functions through two means: direct contingency processes (involving the classic radical behavioral principles of operant conditioning, respondent conditioning, and stimulus generalization along formal stimulus dimensions) and verbal processes. Verbal processes involve *relational* and *derived relational responses* between stimuli that result in transformations of stimulus functions according to these specific relational responses, in a manner that cannot be accounted for with direct contingency principles. For example, a school-aged child named Abe may be told by a peer that he's "smarter than Jimmy" but "dumber than Tom." Using the ">" and "<" signs to stand in for the relations of "smarter" and "dumber," respectively, this small instance of direct relational learning just experienced by Abe may be symbolized by the statement "Tom > Abe > Jimmy." RFT predicts that the simple act of relating stimuli in this fashion will change (or transform) the stimulus functions of each stimulus.

Say, for example, that prior to this event, Tom and Jimmy (as stimuli) functioned in a similar fashion for Abe. Abe viewed them as "fun"

---

[1]The term *deliteralization* was abandoned in favor of *cognitive defusion* for a deceptively simple and practical reason: *deliteralization* was deemed too difficult to pronounce (Hayes, personal communication, 2003).

playmates, and as a result, when he saw them, he initiated play with them and generally found their company very reinforcing. Once exposed to our small bit of relational learning, however, Tom and Jimmy come to function differently for Abe, as their respective stimulus functions have been transformed through verbal learning processes. Now, Jimmy (the "dumbest" one) may function to elicit scorn and ridicule from Abe, and Tom (the "smartest" one) may function to elicit embarrassment and avoidance from Abe. Tom and Jimmy together—even though Abe has never been *directly* taught that a relation along the dimension of intelligence exists between these two peers—may also come to function differently as a result of Abe's *derived* relational response that Tom is smarter than Jimmy. Now, these two children (stimuli) together may function to elicit responses from Abe like "Tom's smarter than you!" and "Why are you hanging out with a big dummy?"

These examples help illustrate characteristics of verbal processes critically relevant to the Hayes et al. (1999) definition of defusion. Relational (and derived relational) responses, which form the core of language and cognition from an RFT perspective, transform the stimulus functions of related stimuli in ways that direct contingency operants and respondents cannot (see Hayes, Blackledge, & Barnes-Holmes, 2001, for a detailed description of why such abstract and indirect transformations are not accounted for by direct contingency learning). Regardless of how the world looks from a direct contingency perspective, functions established through verbal means very often come to dominate nonverbal functions, often to our detriment (Hayes et al., 1999; Hayes, Barnes-Holmes, & Roche, 2001).

The Hayes et al. (1999) definition clearly states that defusion works through disrupting or "breaking down" stimulus functions transformed through verbal processes and suggests that this outcome is accomplished chiefly by making the "ongoing process of framing events relationally . . . evident in the moment." Given that these transformations of stimulus functions are contextually controlled (Barnes-Holmes, Hayes, Dymond, & O'Hora, 2001), we can assume that this breaking down of stimulus functions occurs through some sort of strategic change or changes to this context. Presumably, this contextual change occurs when the ongoing process of relational framing becomes evident as it occurs. Hayes et al. (1999) have suggested that an attentional focus on the stimulus products of relational framing (i.e., the content of what one is thinking or saying) is a necessary feature of meaningful language use and that a meditative or observational focus on the process of relational framing (i.e., an ongoing attentional focus on the process of thinking or speaking) temporarily prevents words from evoking any or all (depending on the degree to which defusion is sustained) of their experiential referents.

The original Hayes et al. (1999) conceptualization of defusion makes explicit and relatively precise references to RFT-based processes, laying the foundation for a precise technical definition of defusion that could be tested under tightly controlled conditions in a basic experimental lab.

However, this initial definition may benefit from some additional expansion and discussion, and it is argued that the expansion and discussion presented later in this article may enhance the definition's utility in guiding both basic experimental research and more focused and potentially more innovative defusion work by ACT practitioners.

A second conceptualization of cognitive defusion was offered by Wilson and Murrell (2004), who proposed, "Interventions that attenuate the relationally conditioned functions of thoughts can be considered defusion strategies. . . . Cognitive defusion . . . refers to procedures that broaden [behavioral] repertoires with respect to stimuli that have their psychological functions through relational (or verbal) learning processes" (p. 131). In continuity with Hayes et al. (1999), Wilson and Murrell clearly proposed that defusion is designed to address stimulus functions that have arisen through relational (i.e., verbal) processes.

In contrast with Hayes et al. (1999), Wilson and Murrell (2004) proposed that defusion operates through the broadening of behavioral repertoires. This supposition has considerable merit within the confines of ACT therapy. Indeed, defusion strategies in ACT are used solely to facilitate more effective and consistent client movement toward individual values. Thus, from an ACT perspective, defusion is useful only when it accomplishes these goals, typically by expanding the client's behavioral repertoire to include responses that were previously "prevented" through rigid cognitive fusion *and* that are more likely to achieve values-congruent outcomes. Correspondingly, Wilson and Murrell's definition effectively combines the processes of defusion and values-related behavioral activation, yielding a conceptualization that addresses the purpose of defusion within ACT. However, this conceptualization was provided basically as a side note in a chapter focused on a discussion of values in ACT, and thus little opportunity was afforded to the authors to clarify precisely *how* defusion might function to broaden behavioral repertoires. Also, in keeping with the chapter's primary focus, this conceptualization links defusion inexorably to a more flexible and effective pursuit of values (alluded to by the authors' focus on broadened behavioral repertoires). While this tight link between defusion and values has important practical implications within ACT, casting defusion in this light limits the process's applicability solely to ACT, eliminating the potential for the process to be studied empirically in other contexts.

These separate discussions of cognitive defusion do two things: establish cognitive defusion as a core psychological process within ACT (indeed, Hayes, Strosahl, Bunting, Twohig, & Wilson, 2004, cite defusion as one of the six cornerstones of ACT) and provide initial conceptualizations of the process. As will be seen in later discussion of specific ACT defusion techniques, the process may actually be markedly active in a broad variety of psychotherapeutic treatments (particularly treatments that incorporate a specific mindfulness component). From these initial treatments of defusion, several questions arise. How might the term *cognitive defusion* be specifically operationalized? What kinds

of contextual manipulations instantiate defusion? What are some of the hypothesized short- and long-term effects of defusion? The remainder of this article comprises an attempt to provide some preliminary answers to these questions.

Cognitive Defusion: Disrupting the Context of Literality

To more effectively guide both basic experimental and applied investigations of defusion, it seems necessary to advance a thorough and precise theoretical conceptualization of the phenomena this construct is intended to capture. Since ACT owes much of its theoretical basis to RFT, it seems sensible to offer an RFT-based conceptualization. From an RFT perspective, verbal transformations of stimulus functions are contextually controlled (Barnes-Holmes, Hayes, & Dymond, 2001). In other words, certain contextual conditions must be in place for verbally specific processes to change stimulus functions (i.e., for cognitive *fusion* to occur). We can thus logically assume that changing these contextual conditions in certain ways would lead to a disruption of these verbally based functional transformations. This, it is argued, is the essence of cognitive defusion.

Precisely how verbal stimulus functions are transformed from moment to moment is dependent on the interplay of potentially complex contingencies of reinforcement in the socioverbal environment. The term *context of literality* has been used (e.g., Hayes et al., 1999; Hayes, Barnes-Holmes, & Roche, 2001) to provide a simple label for these complex and varied contexts. The contingencies established in a context of literality can change rapidly and may result in markedly different stimulus transformations even with respect to the same stimuli. For example, the functional transformations of the verbal stimulus "water" in a context where the verbal response "I'm thirsty—I need some water" is made might result in a visual image of a glass of water, an almost tactile sensation of the glass being held in one's hand, and the imaginal sensation of tasting and swallowing water becoming "attached" to the word *water*. Moments later, when a voice from around the corner is heard to say, "The lawn's turning brown—you need to water it," the word "water" would take on an entirely new set of stimulus functions. Thus, even the same verbal stimuli in different contexts can be subjected to different functional transformations. Functional transformations of *different* verbal stimuli in different contexts could result in a virtually unlimited degree of variety.

It thus seems apparent that contexts producing different entailments and transformations of function differ significantly from one another, and that literally every context producing even slightly different entailments and transformations necessarily differs in some way from another. However, given the commonalities with which a given language is spoken, it also seems likely that there are commonalities across contexts of language use. In other words, regardless of the contextual differences that produce differential entailments and transformations *between* contexts, uniform

similarities *across* contexts within a given language must be present for language to be spoken with meaning and listened to with understanding.

Contextual commonalities that are present across all instances of meaningful use of language appear to include such features as (a) an attentional focus on the stimulus *products* of derived relational responding as opposed to the *process* (i.e., a focus on the content of thinking or speaking versus the process of thinking or speaking); and (b) relatively standardized speech parameters involving the use of certain words to designate certain stimuli and relations, certain grammatical and syntactical sentence structures, limited rates and frequencies of speech (i.e., speech must be not too fast and not to slow, and the same word or words may be repeated only so many times for that speech to have meaning), and relatively conventional style of speech. Contingencies of reinforcement across all socioverbal contexts control these uniformities, and the operant processes inherent in derived relational responding are dependent on these uniform contingencies to function as they do. To the extent that any of these contextual uniformities control transformations of function arising along with a person's derived relational responding, these transformations would be expected to cease or be disrupted once those contextual features are removed.

In more technically precise and succinct terms, it could be stated that cognitive defusion is a process in which targeted verbal stimulus transformations are at least temporarily disrupted by the introduction of contextual cues that displace key, ubiquitous features of the context of literality controlling the processes of relational responding that give rise to verbal stimulus transformations in general. Colloquially, defusion occurs when language-use conventions are violated to the point that specific words or phrases lose their ability to make these words' abstract referents psychologically present and appear to exert control over subsequent behavior. It is not currently empirically known what these "ubiquitous features" of the context of literality are. Thus, the following discussion is offered as a tentative exploration of the ways in which signature ACT techniques (and often, mindfulness techniques used in treatments other than ACT) might achieve defusive effects.

Focus on Process Versus Content

One of the most pervasive elements of defusion techniques in ACT involves shaping clients to observe the process of derived relational responding as it occurs (in other words, to observe the process of thinking as that thinking is occurring), as opposed to observing only the stimulus products of derived relational responding. Attending to the actual process by which these stimulus products are produced reduces the behavior regulatory impact of these products and, indeed, may even result in enough of a disruption of engagement in the process to prevent the *creation* of these transformed stimulus products. In a metaphorical sense, it is harder to disappear into a movie, psychologically speaking, if one is aware of the processes used to produce it. As suggested by Hayes et al.

(1999), absorption in the products of the process of languaging appears to be a nearly ubiquitous component of the context of literality. Thus, violation of this convention would help to disrupt that context and create a "context of cognitive defusion."

Commonly used ACT techniques that plausibly affect this feature of the context of literality include various observer perspective exercises, in which the client is explicitly prompted to notice thoughts as verbal events distinct from one's sense of self; "cubbyholing" techniques, which involve explicitly labeling thoughts as thoughts and emotions as emotions as they arise; speaking of thoughts as strings of words that can be "bought" (believed) or not; and various meditation and mindfulness exercises functionally similar to techniques used in treatments such as dialectical behavior therapy and mindfulness-based cognitive therapy. An additional example includes the "take your mind for a walk" exercise, a "field exercise" in which the client is instructed to commit to walking in a chosen direction while the therapist plays the role of her "mind," critically evaluating the client's choice and otherwise attempting to verbally change the direction the client has chosen to walk in. This exercise thus attempts to highlight "the distance" between oneself and verbal events, as well as frame nonconstructive thoughts as rather arbitrary words that need not have any bearing on subsequent action.

From an RFT perspective, this focus on process versus content might more technically involve contextual manipulations that result in a person discriminating that she is responding from I-Here-Now to thoughts framed as I-There-Then. Barnes-Holmes, Hayes, & Gregg (2001) noted that "all psychological experiences, all thoughts and feelings, occur from the perspective of 'I' located 'HERE' and 'NOW'" (p. 242). In other words, thoughts and feelings, when noticed by their originator *as* thoughts and feelings, are always noticed from the same locus of perspective. Indeed, every single event a person has experienced or perceived over the entire course of his or her life is perceived from this single locus of perspective. (See, for example Kohlenberg & Tsai, 1991, for a detailed description of how this locus develops.) However, while it must logically be the case that we always respond to thoughts, feelings, and other experiences and events from this locus ("I") in the *here* and *now*, it is extremely rare for us to explicitly discriminate a separation between this locus of perspective and the thoughts and feelings perceived. While we respond from this locus, we do not typically frame our experience as one in which we respond from this locus—where this locus is actually something separate from the thoughts and experiences it "notices" and responds to. In fact, the full range of transformations of function enabled by thinking or speaking may actually require that this discrimination of thoughts occurring *there* and *then* not be regularly made, because making this discrimination in midthought or midspeech disrupts the flow of speaking and thinking—and thus disrupts the complex confluence of contextual variables that control verbal transformations of function.

ACT "observer perspective" interventions attempt to experientially

(as opposed to didactically) establish *I-Here-Now* as the client's identified "self" by repeatedly demonstrating the distinction between the *I* that is always *Here* and *Now* and thoughts and feelings that *I* can always perceive as *There* and *Then*—as things that occur "at a distance" from the *I* which perceives them. Of necessity, any thought that is noticed is always noticed at least slightly after the fact. *I* have a thought and then very quickly notice that *I* am thinking. But this noticing cannot begin sooner than just after the noticed thought begins; thus, the noticed thought occurs *there* at a time other than now (see, for example, Hayes et al., 1999, the last paragraph on p. 74). It occurs in the past, or *then*. Such ACT interventions are intended to strengthen the client's ability to discriminate her "self as context" (Barnes-Holmes, Hayes, & Dymond, 2001, p. 129)— her self as an arena in which thoughts and other experiences unfold and are observed—in an effort to supplant the contextual conditions that lead her to frame thoughts and feelings as equivalent to herself (in essence, the contextual conditions that lead her to frame her self in a coordinative relation to the content of her thoughts and feelings).

Violation of Standard Speech Parameters and Styles

Violation of speech parameters may also be effective in creating a context of defusion in place of a context of literality. Rate and frequency of speech conventions are also violated by certain ACT techniques. Within all language-able cultures, the rate at which words are spoken and the frequency with which the same words are repeated are limited to a relatively narrow range. We speak at a certain speed, sometimes a little more quickly when agitated or excited, sometimes a little more slowly when tired or thoughtful. Additionally, we are generally discouraged from repeating the same word often during a conversation, especially if repeated serially. These rates and frequencies remain relatively uniform whenever we use language. Since these features are always present when language is being used in a meaningful or literal manner, it therefore seems plausible that language could lose its meaning when these rate and frequency conventions are radically violated.

Common ACT interventions such as repeating, over and over for a minute or longer, a single word or short phrase (such as "milk" or "I'm bad"; see Masuda et al., 2004, for an empirical evaluation of this specific technique) and speaking an evaluative sentence very, very slowly, violate these frequency and rate requirements. Such techniques also make the direct stimulus qualities of words more salient and thus more likely to be responded to than the indirect stimulus functions imparted to these words through relational framing. Markedly altering style of speech or tone of voice from what it typically is when focused on distressing matters may also achieve defusive effects, as suggested by the use of ACT techniques to encourage clients to actually sing problematic thoughts along with a familiar melody or speak them in a markedly silly voice. Some ACT therapists have had clients replace key words from problematic thoughts with foreign words unknown to the client (e.g., changing "I'm too angry

to talk him" to "I'm too *verargert* [the German word for *angry*] to talk to him"), which may plausibly temporarily disrupt some of the problematic functional transformations associated with the translated word.

Violations of standard speech parameters may actually, in part or in whole, exert defusive effects by focusing the "violator's" attention on the process of speaking versus the content of what is being spoken. Attempting any of the exercises listed in the last paragraph for oneself will likely verify this supposition. However, for practicality's sake, it seems reasonable to focus on the role that standard speech parameters play in relational framing. The identification of standardized speech parameters as important contextual features in fusion and defusion acknowledges the role that grammar, syntax, and other language rules play in controlling entailments and associated verbal transformations, and provides a pragmatically useful set of guidelines for therapists who wish to design new defusion techniques.

Distinguishing Between Formal and Arbitrary (Abstract) Stimulus Properties

While the last two sets of contextual cues may be present across all meaningful instances of language use, other language conventions targeted by defusion strategies in ACT appear to be confined to subsets of language use. One such subset involves evaluative language, given the pervasive and problematic role such language appears to play in psychological distress (Hayes et al., 1999). (Consider, for example, how fusing with negatively self-evaluative language would increase aversive stimulation from an RFT perspective). The ACT distinction between descriptive and evaluative language corresponds to the RFT distinction between formal and arbitrary (e.g., abstract) stimulus properties (respectively), where formal stimulus properties refer to those that can be directly perceived with one of the five senses, and arbitrary properties refer to stimulus properties that are not concrete and directly sense-able. From an RFT perspective, the ability to relationally respond along arbitrary (or abstract) stimulus dimensions (e.g., the ability to verbally evaluate) is what differentiates verbal humans from nonverbal animals; nonverbal animals can be taught to relationally respond along formal stimulus dimensions but not nonformal dimensions. Indeed, RFT predicts that language enhances psychological distress among humans, to a large extent *because* it enables relational responding along nonformal stimulus dimensions—in other words, because it enables evaluation along abstract or nonformal stimulus dimensions. Thus, it should not seem surprising that contingencies centering on this formal-arbitrary divide should be a primary target of defusion strategies, in general and in ACT.

Typically, key ACT defusion exercises may attempt to capitalize on this distinction by helping the client notice experientially the distinction between the formal stimulation that arises from direct experience and the abstract and "illusory" stimulation that arises from indirect experience (i.e., via verbal processes). Experiential and meditative exercises commonly used in ACT and other acceptance-defusion–oriented treatments involve

an explicit focus on the formal properties of direct experience rather than on often abstract languaging about direct experience. This, in and of itself, may provide an important contextual shift that helps to undermine the context of literality. Direct experiencing is fundamentally different from describing direct experiencing. Feeling the air entering and exiting your body when you breathe, for example, is quite different from thinking about your breathing. Directly experiencing your breath involves the formal stimulus property of tactility. There is a perceptual solidity to the experience that cannot be achieved by thought. In lay terms, the direct experience simply feels more real and tangible than the stimulus products of relational framing. Repeated experiential contact with the discrepancies between language and direct experience may thus help undermine the literal belief that language describes reality, that the transformed stimulus functions connected to words are tangible and immutable. Colloquially, one may then begin recognizing that words are words and that direct experience is something entirely different. This concept violates an implicit feature of the context of literality, which arguably establishes that to some extent words share the tangible and directly perceivable quality of direct experience.

The "description-evaluation" exercise, in which ACT clients are experientially taught to notice the distinction between the concrete referents of descriptive words and the intangible and potentially illusory referents of abstract, evaluative language, similarly attempts to strategically short-circuit the stimulus transformations that arise from problematic evaluative languaging. The "teach me how to walk" exercise often used in ACT (where it is experientially demonstrated how language is inadequate to instruct the complex moment-to-moment bodily movements entailed in walking) takes the distinction between language and direct experience to an extreme by demonstrating how even descriptive language cannot capture the full complexity of direct experience.

As with violations of standardized speech parameters, distinguishing between formal and abstract stimulus properties at an experiential level also inevitably focuses attention on the process of languaging. However, the same arguments for including this category as something separate from process versus content defusion interventions holds here. From a pragmatic perspective, holding this category as separate observes the contextual roles such a distinction (or lack of distinction) plays in controlling relational framing and may provide a useful template for the design of additional defusion techniques.

Extinguishing Problematic Reason-Giving and Coherent Framing

Another circumscribed set of features often present in the context of literality appears to be targeted by a number of ACT defusion techniques. From an ACT perspective, arbitrary verbal formulations are often seen by verbally capable people as necessary causes for subsequent behavior. Often, the presence or absence of particular emotions (e.g., " I was too anxious to do it"; "I wasn't motivated enough to get it done on time"),

evaluative thoughts that participate as conditionals in verbal rules ("I won't do it because it's not fair"; "He has to apologize because what he did isn't right"), and more global verbally construed life stories (e.g., "I can't get close to anyone again because I've been betrayed too many times"; "I don't deserve a good life because of all the bad things I've done") are cited by clients as unshakable reasons that mandate subsequent problematic or values-inconsistent behavior (see, for example, Hayes et al., 1999). At other times, clients may act as if the implicit goal of the way they verbally frame their experience is the creation or maintenance of a story that is coherent and "correct"—one that is internally consistent and appears to explain one's collective experiences and their ramifications accurately. (See Blackledge, Moran, & Ellis, under submission, for a recent summary of RFT data on relational coherence as a reinforcer.) From a functional contextual perspective, it is assumed that tendencies to "reason-give" and develop coherent ways of framing experience exist because these behaviors are reinforced.

Thus, ACT defusion techniques intended to disrupt problematic instances of reason-giving and coherent framing attempt to place these responses on extinction. For example, the "why, why, why?" technique involves the therapist repeatedly responding to client reasons as to why they can or cannot engage in given behaviors with "why?" questions that consistently fail to accept the evaluative and rigidly rule-governed reasons the client presents. The "Okay, you're right—now what?" technique attempts to highlight the pragmatic futility of problematic coherent or "correct" causal stories by pointing out that nothing tangible has been gained by fusing with such stories. Questions such as "What is that thought in the service of?" (applied when a client is fusing with an apparently coherent way of framing his experience that effectively disables values-consistent movement) can then be asked to help focus the client on the relatively empty rewards of "being right" versus the pragmatic utility of defusing from the thought in service of moving toward a value. The "create a new story" exercise asks clients to repeatedly rewrite their life history such that the same events resulted in different plausible outcomes as a way of experientially illustrating the arbitrary nature of verbal conceptualizations as causes.

Collectively, these techniques appear to be intended to withhold reinforcement for specific ways of framing theorized to often cause problems for ACT clients—including relational responses that involve causal reason-giving and unnecessarily debilitating ways of framing that are maintained by coherence, not workability. Some of these techniques, as described, may also orient clients toward more practical, concrete sources of reinforcement. However, it also seems plausible that these techniques could focus the client's attention on the process (versus the content) of speaking and thinking, thus functioning similarly to other defusion techniques.

If these techniques do function to extinguish specific problematic relational framing responses, it seems they may work differently from the

other types of defusion techniques described in this article. Extinguishing relational responses is not the same as disrupting the verbal functions of relational responses that continue to be emitted. The experimental disproof of this conceptualization would be demonstrated if subjects exposed to such techniques continued to frame relevant aspects of their experiences as before, yet these reasons and coherent stories ceased to function in accordant ways.

Defusion Techniques Violating Multiple Features of the Context of Literality

Many existing ACT defusion techniques may have defusive effects by virtue of violating more than one set of features of the context of literality. For example, meditation and mindfulness exercises may facilitate a focus on the process of languaging and highlight the discrepancy between formal and nonformal stimulus properties. And the "milk exercise" could be said to comprise a violation of speech frequency parameters, but the technique also results in the speaker attending to the process of speaking the word.

Clearly, no empirical evidence yet exists for the categorization of each of these techniques or for the potential pragmatic utility of the categories themselves. Part of the intent of offering such groupings is to spur such research. The four categories proposed here are also offered with the intent of providing a more explicit preliminary guide to the conceptualization and development of applied cognitive defusion techniques. Given these parameters, to design a technique that potentially functions in a defusive manner, one must, in general, simply observe the ubiquitous conventions surrounding the common use of and literal belief in language. Defusion techniques may essentially involve systematic and strategic violations of these conventions.

Defusion: Observations and Hypotheses

It seems highly plausible that the most pervasive contributor to a context of literality involves a focus on the products of one's relational responding, versus a focus on the *process* of relational responding in and of itself. Thus, a key component of defusion may involve focused attention on the process of thinking or speaking, versus a focus on the content of what is thought or spoken. Additionally, the context of literality should include characteristics of language use that appear to always present when language is spoken with meaning and listened to with understanding, such as remaining within set speech parameters, an "assumption" of correspondence between verbal behavior and direct experience, and coherent relational framing. The effects of defusion may occur on a continuum from one to all proximally emitted relational responses, may be brief (or interspersed with repeated "returns" to a context of literality), may have the effect of broadening one's behavioral repertoire, may facilitate a subsequent focus on direct contingency stimulus functions or alternately available verbal stimulus functions, and

may contribute over time to a learning history that comprises a meaningful part of future contexts of defusion even in cases where specific defusion techniques are not "intentionally" used. As each of the pre-empirical hypotheses in the last sentence requires elaboration, the next several paragraphs will involve a more detailed discussion of these issues.

Defusion on a Continuum

Anecdotal evidence suggests that defusion is best thought of as being on a continuum or occurring in degrees, not typically as an all-or-nothing endeavor. While extensive meditation, for example, might eventually create a context where words literally "lose all meaning," this is probably not the typical outcome of defusion techniques used in psychotherapy. Within ACT, for instance, specific thoughts that inhibit effective movement toward personally held values, rather than every instance of relational responding the client engages in, are typically targeted for defusion. Not even all aspects of such thoughts are typically targeted. For example, if a client who values psychological intimacy with his wife stated, "I can't ever tell my wife what I've done in combat," an ACT therapist might try to defuse the prohibitive functions associated with the word *can't* but would not attempt to defuse the functions associated with words such as *wife* and *combat*. At other times, the targets of defusion strategies in ACT include broader sets, involving entire classes of evaluative language or overly prescriptive behavioral rules. And at other times, specific functions of a verbalization may be defused, but not others. For example, the relational response "My teenage son usually doesn't give a damn about what I think" might make a parent become angry, not implement consistent behavioral consequences for his son, and lash out verbally when his son appears unconcerned with his father's opinions. An ACT therapist would make no attempt in such a case to defuse the emotive function (anger) of the thought (instead opting to facilitate acceptance of this emotion) but would be likely to target the latter two verbally mediated functions.

Defusion as Temporary

Furthermore, because literal functions are useful in many situations, defusion probably tends to occur intermittently rather than to involve permanent instantiation. As speculated previously, degrees of defusion occur on a continuum, with moderate degrees loosening tight fusion with one set of derived relational responses and allowing the emergence of others, and extreme degrees defusing language completely, leaving only stimulus functions generated by direct contingencies. A loosened grip on one (and only one) way of framing one's experience allows a broader variety of stimulus functions to emerge—functions yielding other (potentially more practical) ways of responding based on other framings or on more formal stimulation. The old, problematic way of framing events will often recur intermittently, but continued exposure to defusive stimulation may still provide sufficient exposure to alternate stimulus functions that involve new ways of responding. This recurrence of problematic framings

would often be expected because the learning history behind such sets of derived relational responses is typically a long one and the responses exist at high strength, leading to their intermittent emissions when defusive contextual cues become temporarily less salient.

As an accessible example of this intermittent process, one could liken the existing problematic way of framing events to a science fiction hologram with an electrical short. The initial hologram may consist of frightening images that block alternate holograms and the world of direct contingencies from view. Once an electrical short is initiated, however, the problematic hologram will fade in and out, allowing alternate views of one's present situation. The problematic hologram need not be entirely eliminated if other aspects of the situation can be viewed as well, and if the hologram can be intermittently viewed not as a prescriptive reality but rather as a fabrication. When this intermittency occurs, a wider variety of stimulus functions becomes available, allowing a broader and more flexible array of responses.

Defusion and Broadened Behavioral Repertoires

As suggested in the previous paragraph, cognitive defusion may often result in a broadening of one's observed behavioral repertoire. In part because of the conventional contexts that establish language consistencies, once one fully fuses with verbal transformations of function, the range of responses elicited by these functions tend to be relatively narrow and may not be pragmatically useful in current contexts. Their not uncommon impracticalities stem from these transformations being largely the product of indirect, relationally established contingencies that may have little to do with responses that can most effectively manipulate the environment to one's advantage. Contingencies that govern derived relational responding are often arbitrary in nature, establishing a field where responding in a manner that does not violate the coherence of a relational network (for example) may often take primacy over responding in a way more appropriate to existing direct contingencies. This can result in the emission of responses that are counterproductive, self-defeating, and wildly impractical if one simply considers what the stimulation provided by other relational responses or more direct and formal contingencies could yield.

Clearly not all instances of derived relational responding involve impracticality; in fact, many such instances do not. But once an organism becomes tightly fused with a problematic or impractical way of framing events, that organism is locked into a pattern of responding designated by that frame; since a stimulus function refers to both a stimulus and the response made with respect to it, the presence of a given verbal stimulus function implies the emission of responses designated by that function. Thus, more practical responses (whether based on direct contingencies or other derived relational responses) become a virtual impossibility as long as these verbal stimulus transformations hold sway.

Rigid fusion with a set of derived relational responses limits responding, because such framing mandates the circumscribed set of functional

transformations designated by that set, and functions that would be present given a different way of verbally framing events (or functions arising solely from direct, nonverbal contingencies) simply do not arise. This is a problem when the functional transformations designated by a given frame do not yield responses that provide maximal access to stable sources of relatively high ratios of positive reinforcement. In such cases, loosening this rigid fusion would be highly desirable.

However, expansion of a behavioral repertoire may not be an inevitable effect of defusion, though empirical investigation must ultimately determine whether defusion does or does not always have this effect. For example, consider the effects of "mindfully" noticing *here* and *now* that one's thoughts are occurring *there and then*, a situation that appears to be a ubiquitous hallmark of defusion. While this awareness would be expected to disrupt some or all of the verbal transformations of function associated with the perceived thoughts, it seems far from a foregone conclusion that such a situation must result in increased behavioral variability. Certainly, the functions of the observed thoughts previously determined by verbal processes would at least temporarily "disappear," allowing the emergence of direct contingency functions. Also, these thoughts might also be said to serve an "orienting" function, since the person thinking them is now orienting his attention toward them. Beyond this, no additional behavioral functions need be present. An observer could simply continue to observe his thoughts, without behaving any differently or any more effectively with respect to external circumstances. As Wilson and Murrel (2004) intimated, defusion may need to be tied directly to some additional set of procedures (e.g., values-driven behavioral activation) to maximize the possibility that it will result in increased behavioral variability.

Defusion as a Precursor to More Adaptive Framing

Discussion of defusion as something that involves a shift in perspective from *I-Here-Now* to *I-There-Then* (e.g., Barnes-Holmes, Hayes, Dymond, & O'Hora, 2001) directly invokes the hypothesis that defusion experiences may lead someone to subsequently reframe aspects of her experience in a way concordant with these defusion experiences. In other words, though defusion is theorized to function by *disrupting* verbal framing, its effects may change the person's learning history such that she frames her experience differently as a direct result of defusion. The analysis by Barnes-Holmes, Hayes, Dymond, and O'Hora can be interpreted to imply that defusion works, in part, to disrupt the ongoing process of framing verbally transformed stimuli occurring *here* and *now* as self-definitive facts coordinate to *I,* and involves the individual responding to these stimuli as now discrete stimulus products noticed as such shortly after their emission. From this perspective, these stimulus products do not have to be *verbally framed* as occurring *there* and *then*, separate from the *I* who perceives them. A context of defusion can simply lead the individual to attend to these stimulus products as mere auditory or visual stimuli while their verbal transformations are disrupted. Since attending,

by definition, must involve noticing something else (something *there)* that began or occurred at least a brief moment ago (which happened *then*), an independent observer privy to the defuser's experience would accurately frame the verbal stimuli as occurring *there* and *then,* separate from the *I* who is the defuser. But the defuser need not *verbally frame* her experience in this manner—defusion may simply uncover direct (nonverbal) contingencies that force experiencing formally verbal stimuli as events occurring separately from her, there and then.

However, the Barnes-Holmes, Hayes, Dymond, & O'Hora (2001) account is more readily interpreted to involve a process in which verbally transformed stimuli are not just defused but also *reframed* as occurring *there* and *then*, as opposed to being framed coordinatively to *I, here*, and *now*. This reframing could be exemplified by the person who, after multiple defusion experiences (due to the impact these experiences have had on the individual's learning history), regularly frames thoughts as "just thoughts" or "just words" during difficult moments. Given our lifelong histories of responding verbally to stimuli, it seems likely that moments of defusion would cycle quickly with longer moments of fusion. If so, framing problematic verbally transformed stimuli in a more adaptive fashion (e.g., as occurring *there* and *then*) may well confer an advantage in many situations and even prompt behaviors that subsequently initiate the process of defusion. Such an account may lend additional credence to the decision by Hayes, Strosahl, Bunting, Twohig, and Wilson (2004) to tentatively distinguish somewhat between self as context-based processes and cognitive defusion as two of six components or processes (along with contact with the present moment, acceptance, valuing, and commitment to acting consistently with values) inherent to the ACT model.

Defusion may spur other types of adaptive framing as well. In its perhaps purest and most extreme form, defusion strategies used in treatments like ACT completely disrupt all verbally transformed stimulus functions for a discrete period of time, such that only stimulus functions arising from direct contingency processes are present. This assumption is a logical extension of the manner in which defusion has been defined here: if one completely removes all the contextual features that control verbal transformations of function, no verbal functions would remain. However, it seems likely that more limited and strategic uses of defusion may not result in this extreme effect but rather simply temporarily disrupt certain problematic verbal stimulus functions and subsequently allow the client to fuse with other verbal stimulus transformations that either cause no relative problems or actually confer a behavioral advantage. For example, if defusion strategies were used to disrupt problematic verbal functions of a client who states "*I'm too anxious to discuss* what I'm upset about with my husband," such strategies might subsequently result in the client fusing with a thought like "I'm willing to talk to him about this since I value closeness with him so much." This professed willingness to "sit with" anxiety in service of furthering valued closeness with her husband technically represents an instance of cognitive fusion, one that, perhaps paradoxically, arose due to

the results of defusion and acceptance strategies targeting her previous unwillingness to face anxiety and do what matters to her. However, an ACT therapist would be unlikely to attempt to defuse any aspects of this statement, as it is composed of some apparently very adaptive and values-consistent verbal stimulus transformations.

The Generalization of Defusion

Finally, it seems that the use of defusion strategies and techniques with a client over time could result in the client benefiting from defusion outside therapy in two highly interrelated ways. First, modeling of defusion techniques by the therapist and their repeated practice by the client would be expected to result in the client emitting these same responses in contexts outside therapy. As with all instances of generalization, it would be hoped that the client would use such techniques properly and in the proper strategic context, and that the client used such strategies in a manner that sufficiently violated key aspects of the context of literality. Second, augmentation of the client's learning history due to repeated exposure to a "context of defusion" may, over time, change the way the client automatically perceives the nature of language, even without any "intentional" use of defusion strategies. In other words, a client repeatedly exposed to experiences in which the illusory qualities of evaluative and overly prescriptive or proscriptive language are highlighted might eventually respond to such classes of language in a relatively defusive manner. Learning history comprises a critical feature of the context surrounding all contingencies and all corresponding transformations of function, so it seems theoretically apparent that a "sufficient" learning history that involves cognitive defusion could result in potentially permanent changes to the function of language for a person under certain circumstances. One of the many empirical tasks at hand, of course, is determining what kind of learning history is "sufficient" for such an outcome.

The Manipulation and Measurement of Defusion

The current analysis is intended to help guide experimental analyses of defusion at the basic, analogue component, and fully applied levels. Given the relatively precise conceptualization offered, it seems clear that more definitive tests of the nature and effects of defusion would occur at the basic experimental level. In other words, given the hypothesis that cognitive defusion strategies disrupt *verbal* transformations of function, it must be demonstrated that such techniques can disrupt stimulus functions clearly established by verbal processes under carefully controlled laboratory conditions. Since several dozen basic experimental RFT publications have established clear procedures for establishing verbal transformations of function, this precondition is not onerous; in fact, Melia et al. (2006) provides a clear template for investigating the disruption of a verbally transformed stimulus function. The basic experimental laboratory will also likely prove a more definitive forum for investigating which kinds of contextual manipulations result in disruptions in verbal transformations

of function. Further, the basic lab will likely prove a useful starting point for investigating the interaction between defusion and other psychological processes. For example, a highly ACT-relevant test of the interaction between defusion and values might be orchestrated by testing the results of defusion strategies in the context where personally meaningful outcomes are at stake.

At the analogue component level, tests of defusion will be less conclusive, given that observed changes in subject behavior after the administration of a defusion technique cannot be definitively ascribed to a disruption of verbally established functions. For example, Bassett and Blackledge (2006) tested the effects of observer perspective prompts (e.g., "notice the distance between you and these words on the screen") in distress associated with endorsed negative self-evaluations (e.g., "I'm a bad person"). While the results suggested that such an intervention decreased associated distress, it could not technically be established that this change was due to a disruption of verbal processes (since the individual learning histories of subjects with respect to the verbal stimulus "I'm a bad person," for example, were not systematically and exclusively manipulated within the experiment). Still, tests of defusion techniques at the analogue and fully applied level will be necessary to assess the real-world impact of defusion techniques when applied to genuine and debilitating psychological distress. Ideally, mutually informed basic and applied research will allow basic RFT researchers to use (in part) commonly applied defusion techniques as inspiration to help identify general contextual parameters worth investigating under tightly controlled conditions, and these findings will help establish parameters for applied researchers to investigate defusion strategies under more clinically relevant conditions.

Conclusion

From an applied perspective, behavioral psychology is useful both to the extent that it tells us how stimuli take on beneficial and problematic functions, and how these problematic functions may be altered or disrupted. In tandem, ACT and RFT propose a detailed account of how verbal processes augment direct contingency processes (like operant and respondent conditioning) to produce potentially problematic stimulus functions—and how cognitive defusion strategies can work to disrupt these functions. While defusion strategies have thus far only been recognized as such with ACT, the functional and topographical similarities between them and techniques evident in mindfulness-based psychotherapies and the cognitive distancing elements of CBT make the implications of the process broadly applicable. Extensive empirical research on the nature and effects of cognitive defusion as a distinct psychological process should begin in earnest.

References

BARNES-HOLMES, D., HAYES, S. C., & DYMOND, S. (2001). Self and self-directed rules. In S. Hayes, D. Barnes-Holmes, & B. Roche (Eds.), *Relational frame theory: A post-Skinnerian account of human language and cognition* (pp. 119–139)*.* New York: Kluwer Academic/Plenum Publishers.

BARNES-HOLMES, D., HAYES, S. C., & GREGG, J. (2001). Religion, spirituality, and transcendence. In S. Hayes, D. Barnes-Holmes, & B. Roche (Eds.), *Relational frame theory: A post-Skinnerian account of human language and cognition* (pp. 239–251)*.* New York: Kluwer Academic/Plenum Publishers.

BARNES-HOLMES, D., HAYES, S. C., DYMOND, S., & O'HORA, D. (2001). Multiple stimulus relations and the transformation of stimulus functions. In S. Hayes, D. Barnes-Holmes, & B. Roche (Eds.), *Relational frame theory: A post-Skinnerian account of human language and cognition* (pp. 51–72)*.* New York: Kluwer Academic/Plenum Publishers.

BASSETT, D., & BLACKLEDGE, J. T. (2006). Instantiating defusion using observer perspective prompts. Unpublished manuscript.

BECK, A. T. (1970). Cognitive therapy: Nature and relation to behavior therapy. *Behavior Therapy*, 1, 184–200.

BLACKLEDGE, J. T. (2003). An introduction to relational frame theory: Basics and applications. *The Behavior Analyst Today*, 3, 421–433.

BLACKLEDGE, J. T., MORAN, D. J., & ELLIS, A. Bridging the divide: Linking basic experimental research to applied psychotherapeutic treatments—A relational frame theory analysis of rational-emotive behavior therapy. Manuscript submitted for publication*.*

HAYES, S. C. (1993). Analytic goals and the varieties of scientific contextualism. In S. Hayes, L. Hayes, H. Reese, & T. Sarbin (Eds.), *Varieties of scientific contextualism* (pp. 11–27). Reno, NV: Context Press.

HAYES, S. C., BARNES-HOLMES, D., & ROCHE, B. (2001). *Relational frame theory: A post-Skinnerian account of human language and cognition.* New York: Kluwer Academic/Plenum Publishers.

HAYES, S. C., BLACKLEDGE, J. T., & BARNES-HOLMES, D. (2001). Language and cognition: Constructing an alternative approach within the behavioral tradition. In S. Hayes, D. Barnes-Holmes, & B. Roche (Eds.), *Relational frame theory: A post-Skinnerian account of human language and cognition* (pp. 51–72)*.* New York: Kluwer Academic/Plenum Publishers.

HAYES, S. C., MASUDA, A., BISSETT, R., LUOMA, J. & GUERRERO, L. F. (2004). DBT, FAP, and ACT: How empirically oriented are the new behavior therapy technologies? *Behavior Therapy*, 35, 35–54.

HAYES, S. C., STROSAHL, K. D., BUNTING, K., TWOHIG, M., & WILSON, K. G. (2004). What is acceptance and commitment therapy? (pp. 1–30). In S. Hayes & K. Strosahl (Eds.), *A practical guide to acceptance and commitment therapy*. New York: Springer.

HAYES, S. C., STROSAHL, K., & WILSON, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York: Guilford.

HEALY, H., BARNES-HOLMES, Y., BARNES-HOLMES, D., WILSON, K., LUCIANO, C., & KEOGH, C. (2006). An experimental analysis of cognitive defusion. Paper presented at the Second World Conference on ACT, RFT, and Contextual Behavioural Science, London, England.

HOLLON, S. D., & BECK, A. T. (1979). "Cognitive therapy of depression." In P. Kendall & S. D. Hollon (Eds.), *Cognitive-behavioral interventions: Theory, research, and procedures*. New York: Academic Press.

KANTOR, J. R. (1938). The nature of psychology as a natural science. *Acta Psychologica*, 4, 1–61.

KEOGH, C., & BARNES-HOLMES, Y (2006). An experimental analysis of cognitive defusion. Paper presented at the Second World Conference on ACT, RFT, and Contextual Behavioural Science, London, England.

KOHLENBERG, R. J., & TSAI, M. (1991). *Functional analytic psychotherapy: Creating intense and curative psychotherapeutic relationships* (pp. 125–168). New York: Plenum Press.

LINEHAN, M. (2003). *Cognitive-behavioral treatment of borderline personality disorder.* New York: Guilford.

MASUDA, A., HAYES, S. C., SACKETT, C. F., & TWOHIG, M. P. (2004). Cognitive defusion and self-relevant negative thoughts: Examining the impact of a ninety-year-old technique. *Behaviour Research and Therapy*, 42, 477–485.

MELIA, R., ROCHE, B., & BLACKLEDGE, J. (2006). Disrupting experiential avoidance: An experimental analogue of cognitive defusion. Paper presented at the Second World Conference on ACT, RFT, and Contextual Behavioural Science, London, England.

PAVLOV, I. P. (1927). *Conditioned reflex: An investigation of the physiological activity of the cerebral cortex.* London: Oxford University Press.

SEGAL, Z. V., WILLIAMS, M. G., & TEASDALE, J. D. (2001). *Mindfulness-based cognitive therapy for depression: A new approach for preventing relapse*. New York: Guilford.

SKINNER, B. F. (1991). *The behavior of organisms.* Cambridge, MA: B. F. Skinner Foundation. (Reprinted from 1938 edition)

SKINNER, B. F. (1957). *Verbal behavior.* Cambridge, MA: B. F. Skinner Foundation.

WILSON, K. G., & MURRELL, A. R. (2004). Values work in acceptance and commitment therapy: Setting a course for behavioral treatment (pp. 120–151). In S. Hayes, V. Follette, and M. Linehan (Eds.), *Mindfulness and acceptance: Expanding the cognitive-behavioral tradition*. New York: Gilford.