ISSN 1982-3541
Belo Horizonte-MG, Brazil
2008, Vol. X, nº 1, 81-102

Brazilian Journal of Behavioral and Cognitive Therapy

Acceptance and Commitment Therapy: model, data, and extension to the prevention of suicide

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Abstract
The present article briefly describes ACT, its underlying model, and the evidence in support of its efficacy. In order to provide an example of how to extend ACT to new problems, the paper then extends ACT thinking to the prevention of suicide and suicidality. ACT, both its model and applied techniques, appears to be supported by the evidence, suggesting that further extensions are warranted.

Key words: Acceptance and Commitment Therapy, Mediation, Prevention, Suicidality

Acceptance and Commitment Therapy or (ACT – which is said as a single word, not "A – C – T"; Hayes, Strosahl, and Wilson, 1999), applies acceptance and mindfulness processes, and commitment and behavior change processes, to the creation of psychological flexibility. ACT is based on a precise and empirically substantial theory of language and cognition, Relational Frame Theory (Hayes, Barnes-Holmes, & Roche, 2001), and its extension into psychopathology. There is a significant and growing body of evidence of the efficacy of ACT across a broad range of problems (Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Hayes, Masuda, Bissett, Luoma, & Guerrero, 2004). Furthermore, its underlying theory is fairly well specified and researched, and the change processes it targets mediate ACT outcomes (Hayes et al., 2006).

At this level of empirical maturity it is possible to use the data on behavioral problems as a guide to the application of ACT in new areas. If the model fits a problem conceptually, and ACT change processes are known to relate to the problem empirically, ACT technology is likely to be effective. The present article briefly describes ACT, its underlying model, and the evidence in support of its efficacy. In order to provide an example of how to extend ACT to new problems, we will attempt to extend ACT thinking to the prevention of suicidality.

One of the larger purposes of this article is to expose Portuguese speak clinicians and clinical scientists to this work. ACT has a small foothold in the Portuguese speaking community (e.g., a Portuguese language list serve – see http://br.groups.yahoo.com/group/actnobrasil/), but presentation of the model and its support has been uncommon.

The ACT Model of Psychopathology

ACT is an approach is defined in terms of certain theoretical processes, not a technology per se. Figure 1 illustrates the core processes that are thought to underlie psychopathology. Each of these processes emerges fro characteristics of human language and cognition, as specified by Relational Frame Theory.

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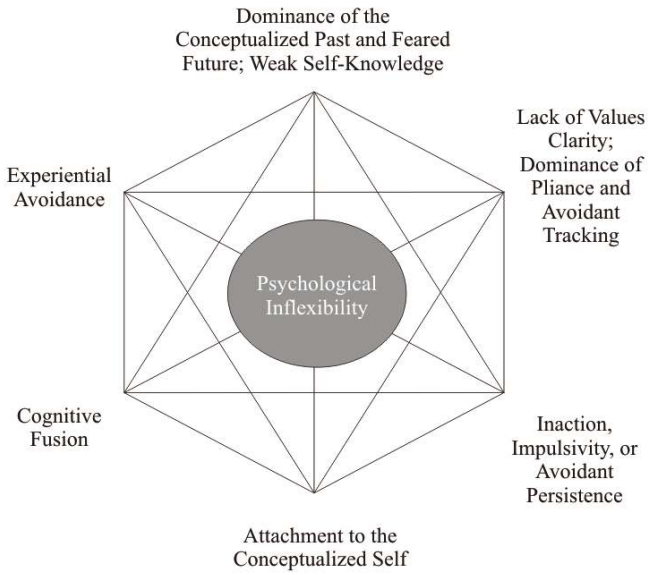

Figure 1 - An ACT model of psychopathology.

Relational Frame Theory

From an RFT perspective, the most dominant characteristic of human language and cognition is that it is based on learned, relational, and arbitrarily applicable operants, that in turn impact other behavioral processes (Hayes et al., 2001). Relating is responding to one event in terms of another, and it turns out that human children can readily be taught to relate events mutually and in combination in distinct ways through multiple exemplar training and reinforcement (e.g., Barnes-Holmes, Barnes-Holmes, & Smeets, 2004; Berens & Hayes, 2006; Luciano et al., 2006). For example, children learn to treat events as equivalent (Luciano et al., 2006), or opposite (Barnes-Holmes et al., 2004), or to treat one as better than another (Berens & Hayes, 2006) with enough reinforced examples. When these "relational frames" are learned, they can be applied to any relata, if the proper relational cues are presented (e.g., Barnes-Holmes et al., 2004; Berens & Hayes, 2006; Luciano et al., 2006), which means that relating is no longer controlled merely by formal properties, contiguity, or direct contingencies. It is "arbitrarily applicable" in the sense that the relational cues provide a kind of empty frame into which events can be placed, such as ___ is smaller than ___. Functions can then be transformed on that basis: for example, if "X is smaller than Y" is learned, and X is then directly paired with painful shock, Y may now elicit even more arousal than X (see Dougher et al., in press for an empirical demonstration).

These abilities are spectacularly useful to human beings in domains such as reasoning and problem-solving, but they raise challenges. A simple frame of coordination allows humans to remember events by talking about them, but this also mean that past painful events can be part of any situation at any time, based only on the minimal cues needed for human thought. A frame of comparison allows relative outcomes to be weighed successfully, but also allows a person to compare himself to an unrealistic ideal and to be found wanting, even if his achievements are notable. A temporal frame allows outcomes to be predicted, but also allows people to fear the unlikely future or to live in the unresolved past to the extent that the present moment disappears. And since these habits of mind are learned, historical, and useful – even es-

sential – they cannot be stopped, eliminated, or suppressed.

Application of RFT to ACT processes. In general terms, cognitive fusion refers to the domination of verbal regulation of behavior over all other behavioral processes (see Hayes et al., 1999 for further details). In some situations that is harmless or even helpful, but this process is generally so overextended such that human behavior is often guided by relatively inflexible verbal networks rather than contacted environmental contingencies, even when that is harmful. As a result, people may act in a way that is inconsistent with what the environment affords.

As behavior becomes dominates by cognitive fusion, thoughts (e.g., "I'm bad") are treated as one would referents (i.e., a "bad" or dangerous object). Emotions become labeled and evaluated. As a result, people tend to focus on how to control emotional and cognitive events as a primary goal and metric of successful living. Experiential avoidance refers to the attempt to alter the form, frequency, or situational sensitivity of private events (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). As with cognitive fusion this is not necessarily harmful in itself, but it becomes so overextended that it persists even when doing so causes behavioral harm. Due to the temporal and comparative relations present in human language, so-called "negative" emotions are verbally predicted, evaluated, and avoided. Experiential avoidance is based on this natural language process – a pattern that is then amplified by the culture into a general focus on "feeling good" and avoiding pain. Unfortunately, attempts to avoid uncomfortable private events tend to increase their functional importance, and sometimes even their magnitude and frequency. They become more salient as an object of control and control efforts are themselves often verbally linked to conceptualized negative outcomes thus further evoking negative thoughts and feelings.

Language has additional negative effects. People lose contact with the present moment as they respond more to the conceptualized past and future. They become entangled with their stories about themselves and their conceptualized self, so that becomes more important to defend a verbal view of oneself (e.g., being a victim; never being angry; being broken; etc) than to engage in more workable forms of behavior. Psychological inflexibility is the result of this process as the long term desired qualities of life (i.e., values) and committed actions that might lead in that direction take a backseat to more immediate goals of being right, feeling good, or defending a conceptualized self.

The ACT Model of Intervention

Figure 2 shows the core intervention processes in ACT. There are six of them, and together they all target psychological flexibility: the ability as a conscious human being to experience fully the automatic emotional and cognitive results of one's history and to persist or change in behavior in the service of chosen values.

Acceptance

Acceptance involves the active and aware embrace of those private events occasioned by one's history without unnecessary attempts to change their frequency or form, especially when doing so would cause psychological harm. For example, anxiety patients are taught to feel anxiety, as a feeling, fully and without defense; pain patients are given methods that encourage them to let go of a struggle with pain, and so on. Acceptance in ACT is not an end in itself. Rather acceptance is fostered as a method of increasing values-based action.

Cognitive Defusion

Cognitive defusion and mindfulness techniques attempt to alter the undesirable functions of thoughts and other private events, rather than trying to alter their form, frequency or situational sensitivity. Said another way, ACT attempts to change the way one *interacts*

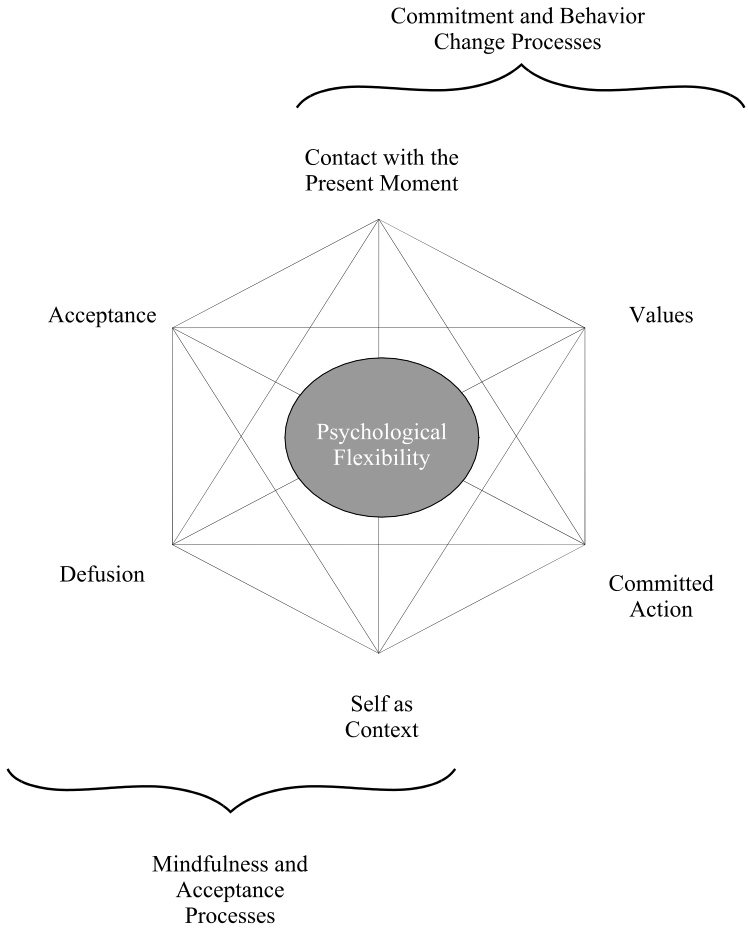

Figure 2 - An ACT model of intervention.

with or *relates to* thoughts by creating contexts in which their unhelpful functions are diminished. There are scores of such techniques that have been developed for a wide variety of clinical presentations (Hayes & Strosahl, 2005). For example, a negative thought could be watched dispassionately, repeated out loud until only its sound remains, or treated as an externally observed event by giving it a shape, size, color, speed, or form. A person could thank their mind for such an interesting thought, label the process of thinking ("I am having the thought that I am no good"), or examine the historical thoughts, feelings, and memories that occur while they experience that thought. Such procedures attempt to reduce the literal quality of the thought, weakening the tendency to treat the thought as what it refers to ("I am no good") rather than what it is directly experienced to be (e.g., the thought "I am no good"). The result of defusion is usually a decrease in believability of, or attachment to, private events rather than an immediate change in their frequency.

Being Present

ACT promotes ongoing non-judgmental contact with psychological and environmental events as they occur. The goal is to have clients experience the world more directly so that their behavior is more flexible and thus their actions more consistent with the values that they hold. This is accomplished by allowing workability to exert more control over behavior; and by using language more as a tool to note and describe events, not simply to predict and judge them. A sense of self called "self as process" is actively encour-

aged: the defused, non-judgmental ongoing description of thoughts, feelings, and other private events.

Self as Context

Because of relational frames such as *I* vs. *You*, *Now* vs. *Then*, and *Here* vs. *There*, human language leads to a sense of self as a locus or perspective, and provides a transcendent, spiritual side to normal verbal humans. This idea was one of the seeds from which both ACT and RFT grew (Hayes, 1984), and there is now growing evidence of its importance to language functions such as empathy, theory of mind, sense of self, and the like (e.g., McHugh, Barnes-Holmes, & Barnes-Holmes, 2004). In brief the idea is that "I" emerges over large sets of exemplars of perspective-taking relations (termed in RFT "deictic relations"), but since this sense of self is a context for verbal knowing, not the content of that knowing, its limits cannot be consciously known. Self as context is important in part because from this standpoint, one can be aware of one's own flow of experiences without attachment to them or an investment in which particular experiences occur: thus defusion and acceptance is fostered. Self as context is fostered in ACT by mindfulness exercises, metaphors, and experiential processes.

Values

Values are chosen qualities of purposive action that can never be obtained as an object but can be instantiated moment by moment. ACT uses a variety of exercises to help a client choose life directions in various domains (e.g. family, career, spirituality) while undermining verbal processes that might lead to choices based on avoidance, social compliance, or fusion (e.g. "I should value X" or "A good person would value Y" or "My mother wants me to value Z"). In ACT, acceptance, defusion, being present, and so on are not ends in themselves; rather they clear the path for a more vital, values-consistent life.

Committed Action

Finally, ACT encourages the development of larger and larger patterns of effective action linked to chosen values. In this regard, ACT looks very much like traditional behavior therapy, and almost any behaviorally coherent behavior change method can be fitted into an ACT protocol, including exposure, skills acquisition, shaping methods, goal setting, and the like. Unlike values, which are constantly instantiated but never achieved as an object, concrete goals that are values-consistent can be achieved and ACT protocols almost always involve therapy work and homework linked to short, medium, and long-term behavior change goals. Behavior change efforts in turn lead to contact with psychological barriers that are addressed through other ACT processes (acceptance, defusion, and so on).

The practical literature on these processes is now very large. In addition to the original book on ACT (Hayes, Strosahl, & Wilson, 1999), there are now several books that show more specifically how to apply an ACT model, either in general (e.g., Hayes & Strosahl, 2004; Luoma, Hayes, & Walser, 2007; Bach & Moran, in press) or with specific problems such as anxiety (Eifert & Forsyth, 2005), trauma (Walser & Westrup, 2007), or depression (Zettle, 2007). In addition, there are a wide variety of books for use with clients themselves, both in general (Hayes & Smith, 2005) or with specific problems including trauma (Follette & Pistorello, 2007), depression (Robinson & Strosahl, in press), diabetes (Gregg, Callaghan, & Hayes, 2007), or anxiety (Forsyth & Eifert, in press).

Empirical Evidence on ACT

Two recent outcome reviews (Hayes, Masuda et al., 2004; Hayes et al., 2006) summarize results of randomized trials. The studies address a broad range of problems, including depression, suicidality, self-harm, substance abuse, chronic pain, anxiety, psychosis, smoking, prejudice, worksite stress, employee burnout, diabetic self-manage-

ment, adjustment to cancer, obsessive compulsive disorder, trichotillomania, adjustment to epilepsy, and self-stigma among others. A meta-analysis of controlled studies (Hayes et al., 2006) reported on 21 randomized trials of ACT then available. The average between group effect size (Cohen's *d*) was .66 at post treatment (N = 704) and .65 (N = 580) at follow-up (on average 19.2 weeks later). In studies involving comparisons between ACT and active treatments, the effect size was .48 at post (N = 456) and .62 at follow-up (N = 404). In comparisons with wait list, treatment as usual, or placebo treatments, the effect sizes were .99 at post (N = 248) and .71 at follow-up (N = 176).

From the standpoint of traditional mental health conceptions, as reflected in the DSM nosology, it might seem odd that a treatment procedure would have an impact on such a broad range of problems, particularly since many of these protocols are not extensive (e.g., three hours with psychotic individuals, six hours for burnout, etc.). This appears to e due to the fact that ACT targets key pathological processes that have been pinpointed in basic behavioral research on language and cognition

In the section that follows, we will present a tutorial review of the ACT evidence. The review will focus on effectiveness studies, efficacy studies, and component studies.

ACT Effectiveness Studies

There have been three effectiveness studies so far on ACT that have assessed the broad impact of ACT. Strosahl, Hayes, Bergan, and Romano (1998) assessed the clinical effectiveness of a group of clinicians in a large health maintenance organization with several clinics and a large hospital. For months, all new clients assigned to these clinicians were assessed regardless of diagnosis at assignment and again five months later. The clinicians were then divided into two groups (on the basis of clinician willingness to participate in ACT training, not randomization). One half were trained in ACT and the other were not. A year later, after two ACT workshops and 4 hours a month of supervision in ACT, all of the new clients of these clinicians were again assessed at entry and 5 months later. Results showed that training in ACT produced generally better client outcomes, reductions in referrals for medication, and more rapid completion of therapy. In short, training produced more effective clinicians, as measured by client outcomes.

The major problems with Strosahl et al (1998) was that it was not randomized and ACT was not compared to training in treatment known to be effective. This was corrected in Lappalainen, Lehtonen, Skarp, Taubert, Ojanen, and Hayes (in press). In this randomized controlled study 14 student therapists treated one client each from an ACT model or a traditional CBT model for 6-8 sessions following a 2 session functional analysis. Participants with any normal outpatient problem were included and were randomized to clinicians. At post and at the 6 month follow up ACT clients were more improved on the SCL-90 and several other measures. Results also showed that ACT patients improved more at post in acceptance, while traditional CBT clients improved more in self-confidence. Both self-confidence and acceptance post scores correlated with follow-up outcomes, but when partial correlations are calculated, only acceptance still related to outcome. At follow-up, ACT clients were now significantly more self-confident than CBT clients.

A final effectiveness trial looked at the impact of ACT and traditional CBT with 101 heterogeneous outpatients reporting moderate to severe levels of anxiety or depression (Forman, Herbert, Moitra, Yeomans, & Geller, in press). Clients were randomly assigned either to traditional CBT or to ACT, using 23 junior therapists. No follow up was taken. Participants receiving CT and ACT evidenced large and equivalent improvements in depression, anxiety, functioning difficulties, quality of life, life satisfaction and clinician-rated functioning. "Observing" and "describing" one's experiences mediated out-

comes for those in the CT group relative to those in the ACT group, whereas "experiential avoidance," "acting with awareness" and "acceptance" mediated outcomes for those in the ACT group.

Overall the effectiveness studies show the training in ACT produces more effective clinicians who can produce equivalent or better outcomes than the best available empirically supported methods. Furthermore the processes of change for ACT are unique and comport with the model.

Group and Controlled Time-Series ACT Efficacy Studies

ACT has been shown to treat a wide variety of disorders and problems such as opiate dependence (Hayes et al, 2004), smoking cessation (Gifford et al., 2004; Gifford et al., in press), marijuana dependence (Twohig Shoenberger, & Hayes, in press), obsessive-compulsive disorder (Twohig, Masuda, & Hayes, 2006), OCD spectrum disorders (Twohig, Masuda, & Hayes, 2006b), and psychosis (Bach & Hayes, 2002), to name a few. In the section that follows we will review this evidence, organizing it by problem.

Depression. The first outcome study every done on ACT was a small randomized trail comparing ACT and traditional CBT for depression (Zettle & Hayes, 1986). The same therapist (trained by both Aaron Beck and Steven Hayes) treated clients in both conditions. Results showed that ACT was more effective that cognitive therapy on depression outcomes (on the Hamilton and BDI). Clients in the ACT condition showed more rapid reductions in the believability of depressive thoughts than did CT. Subsequent analyses (Hayes et al., 2006) showed that these process differences mediated depression outcomes.

A similar study was conducted using ACT and CT in a group format (Zettle & Raines, 1989). Results shows that ACT was as effective as cognitive therapy for depression when presented in this format, and that it works by a different process. The effect sizes differences favored ACT .

A more recent study was done with the parents of disabled children (Blackledge & Hayes, 2006) examining the impact of a group ACT workshop. Those who were depressed showed significant gains from ACT.

Stress and burnout. Bond and Bunce (2000) tested ACT in a study on worksite-based stress reduction. They compared ACT, innovation promotion at work to remove stressors, and a wait list and found that ACT was more effective that the other two groups in reducing worksite stress and anxiety, and was equally effective as compared to innovation promotion (and more effective than the wait list) in changing work related stressors. A measure of experiential avoidance and psychological flexibility, the Acceptance and Action Questionnaire (AAQ: Hayes, Strosahl et al., 2004), mediated ACT outcomes.

Another randomized controlled trial (Hayes, Bissett et al., 2004) found that a one day ACT workshop produced greater decreases in stigmatization of clients by therapists and greater decreases in therapist burnout than an educational control and (in some comparisons) than multicultural training. Mediational analyses showed that these changes were the result of cognitive defusion.

Psychosis. Even extremely limited ACT interventions appear to have a significant impact on psychotic symptoms. Bach and Hayes (2002) found in a randomized controlled trial that a three-hour ACT intervention with hallucinating or delusional patients reduced rehospitalization by 50% over a 4 month follow-up as compared to treatment as usual. Process of change fit the model but would be very much unexpected outside the model. For example, it was found that in ACT admission of symptoms was *positively* correlated with improvements, provided only that the believability of these symptoms was reduced.

This study was replicated and extended by Gaudiano and Herbert (2006a). They used better measures and a control condition that kept total therapist contact time equal. Findings were similarly strong. For example, even though clients only averaged 3 45-min-

ute sessions, more than 50% of the ACT participants improved two standard deviations or more on clinical interviews as compared to less than 10% of the control condition. A separate study showed that hallucination distress was mediated by cognitive defusion (Gaudiano & Herbert, 2006b).

Anxiety. The results in anxiety are positive but somewhat mixed. With clients suffering from obsessive-compulsive disorder, Twohig, Hayes and Masuda (2006) found very large reductions in obsessions and compulsions behavior in a multiple baseline testing an 8 session ACT protocol without in session exposure. In a small randomized controlled trial Zettle (2003) found that ACT is as good as systematic desensitization in reducing math anxiety, but works according to a different process. Systematic desensitization reduced trait anxiety more than did ACT however.

Pain. One of the strongest areas of ACT outcomes in that of pain. Dahl, Wilson, and Nilsson (2004) found in a randomized controlled trial that a four hour ACT intervention reduced sick day usage due to pain by 91% over the next six months compared to treatment as usual in a group of chronic pain patients at risk for going on to permanent disability. In an open trial with 108 chronic pain patients with a long history of treatment, McCracken, Vowles, and Eccleston (2005) found that a 3 to 4 week ACT residential treatment program lead to 34% improvement across all measures as compared to a 3% improvement during the previous four months. 81% of these gains were retained through a 3 month follow up. Changes in pain-related acceptance and psychological flexibility predicted positive changes in depression, pain related anxiety, physical disability, psychosocial disability, and the ability to stand. Positive outcomes were also seen in a timed walk, decreased medical visits, daily rest due to pain, pain intensity, and decreased pain medication use. A second and larger (n = 252) open trial found similar outcomes and more evidence that ACT processes were responsible for the changes (Vowles, McCracken, & Eccleston, in press).

Trichotillomania and skin picking. A series of controlled single case designs (Twohig & Woods, 2004) have shown that ACT combined with habit reversal helps with hair pulling. Thus study was follow by a small randomized trial (Woods, Wetterneck, & Flessner, 2006) comparing ACT plus habit reversal to a wait list. Strongly positive outcomes were found on hair pulling, anxiety, and depression outcomes, maintained at a 3 month follow up. Wait list participants also improved once they were later given ACT. The AAQ moved as well and correlated well with outcomes. Another multiple baseline study found similar outcomes on chronic skin picking (Twohig, Hayes, & Masuda, 2006).

Substance abuse. A large (n=114) randomized controlled trial conducted with polysubstance abusing opiate addicted individuals maintained on methadone (Hayes, Wilson et al., 2004) randomly assigned participants to stay on methadone maintenance (n=38), or to add ACT (n=42), or Intensive Twelve Step Facilitation (ITSF; n=44) components. There were no differences immediately post-treatment. At the six-month follow-up participants in the ACT condition demonstrated a greater decrease in objectively measured (through monitored urinalysis) opiate use than those in the methadone maintenance condition (ITSF did not have this effect). Both the ACT and ITSF groups had lower levels of objectively measured total drug use than did methadone maintenance alone.

A multiple baseline (Twohig, Shoenberger, & Hayes, in press) recently found that ACT reduced the use of marijuana in three clients. Two of them relapsed to a degree at follow up, however.

Smoking. In a randomized controlled trial comparing ACT to nicotine replacement therapy (NRT) as a method of smoking cessation (Gifford et al., 2004) physiologically monitored quit rates were shown to be similar at post but to differ significantly at a one-year follow-up. The ACT group had maintained

their gains (35% quit rates) while the NRT quit rates had fallen (<10%). Mediational analyses showed that ACT works through changes in acceptance and psychological flexibility.

Self-harm. A randomized trial (Gratz & Gunderson, 2006) comparing a combination of ACT and DBT to treatment as usual found very strong outcomes in favor on the ACT/DBT condition on self-harm and several other measures.

Chronic disease. The work on chronic diseases is just beginning but the early results are strong. In a randomized controlled trial, Gregg, Callaghan, Hayes, and Glenn-Lawson (2007) found that ACT + patient education was significantly better than patient education alone in producing good self-management and better blood glucose levels in patients with Type II diabetes. Effects at follow up were mediated by changes in self-management and greater psychological flexibility with regard to diabetes related thoughts and feelings.

Another randomized trial (Lundgren, Dahl, Melin, & Kees, 2006) found that 9 hours of ACT – individual and group – as compared to supportive therapy reduced seizures to near zero level. These effects were maintained for a year. Quality of life improved continuously throughout the 1 year follow up.

Prejudice and stigma. Finally three studies have shown that ACT reduces stigma and prejudice. One of these (Hayes, Bissett et al., 2004) has already been described in the section on stress and burnout. It was described there because reductions in stigmatizing cognitions had a major impact on job burnout. In another study (Lillis & Hayes, in press) undergraduates enrolled in two classes on racial differences were exposed Acceptance and Commitment Therapy and to an educational lecture drawn from a popular textbook on the psychology of racial differences in a counterbalanced order. Results indicate that only the ACT intervention was effective in increasing positive behavioral intentions at post and a 1-week follow-up. These changes were associated with other self-reported changes that fit with the ACT model.

Finally, a randomized controlled trial (Masdua et al, in press) comparing ACT to education in the reduction of stigma toward people with mental health problems found that ACT reduced mental health stigma sregardless of participants' pre-treatment levels of psychological flexibility, but education reduced stigma only among participants who were relatively flexible and non-avoidant to begin with.

Tests of ACT Components

Most the studies of specific ACT components have examined their impact on aversive events, including pain, anxiety, food cravings, and negative thoughts. Some have been conducted with clinical problems, such as the willingness of panic disordered persons to experience exposure (Levitt, Brown, Orsillo, & Barlow, 2004), but most have been conducted with analogue populations.

The first such study showed that an acceptance rationale and brief defusion and acceptance exercises drawn from ACT protocol produces more pain tolerance than a pain control rationale and distraction methods drawn from a popular CBT pain management package (Hayes et al., 1999). Muto, Tada, and Sugiyama (2002) replicated this study, finding that an acceptance rationale plus two ACT defusion exercises ("Leaves on the Stream" and "Physicalizing") produced better pain tolerance that did a matched control-focused intervention or a lecture on pain. Another study used similar defusion exercises with similar findings (Gutiérrez, Luciano, Rodríguez, & Fink, 2004).

Perhaps the largest and best-controlled randomized study replicating Hayes et al. (1999) is Masedoa and Esteve (2006). ACT acceptance methods (an acceptance rationale, practicing awareness of experience, the "Passengers on the Bus" exercise, and the 'Two Scales Metaphor') increased pain tolerance and decreased pain ratings in a cold pressor task as compared both to suppression methods (based on thought stopping) and

to participants preferred method of coping (which tended to include distraction, relaxation, and keeping the hand still). The latter two conditions did not differ from each other in the main analysis.

Similar findings have occurred with anxiety related symptoms. A randomized study comparing control versus acceptance strategies during a CO2 challenge with anxious subjects found that an acceptance oriented exercise (the finger trap exercise) reduced avoidance, anxiety symptoms, and anxious cognitions as compared to breathing training (Eifert & Heffner, 2003). Another study (Feldner, Zvolensky, Eifert, & Spira, 2003) found that highly emotional avoidant subjects showed more anxiety in response to CO2, particularly when instructed to suppress their emotions. panic disordered patients, acceptance methods (drawn directly from Hayes, Strosahl, & Wilson, 1999) did a better job than control strategies in promoting successful exposure to CO2 gas on study (Levitt et al., 2004). A similar study with persons suffering from mood and anxiety disorders, found that
acceptance methods led to lower heart rate during exposure to an aversive film and less negative affect during during the post-film recovery period that did control strategies (Campbell-Sills, Barlow, Brown, & Hofmann, 2006) in panic disordered patients

The same basic pattern applies to the struggle with negative thoughts. Masuda, Hayes, Sackett, and Twohig (2004) showed that in a series of time-series designs and a group study, that the "milk, milk, milk" defusion technique reduces distress and believability of negative self-referential thoughts more effectively that control-focused strategies. A correlational study showed that suppressing personally relevant intrusive thoughts is associated with more thoughts, more distress, greater urge to do something (Marcks & Woods, 2005). Those who were more accepting of difficult thoughts were less obsessional, depressed and anxious. In a second experiment in the same publication, these authors found that instructions to suppress lead to increased level of distress which instructions to accept (using a couple of short metaphors drawn from Hayes, Strosahl, & Wilson, 1999) decreased discomfort but not thought frequency.

A recent study extended these finding to food urges (Forman et al., in press). 98 participants with chocolate cravings were exposed to a well-known CBT-based protocol, an ACT protocol or to no instructions. They then carried chocolate candy with them in a transparent case for two days. Those more impacted by food related cues before the study began ate less and had fewer cravings in the ACT condition than in the other conditions.

Summary and Implications

ACT methods seem to have broad outcomes that comport with an ACT model. So far as we are aware, for the first time in the psychotherapeutic literature, consistently positive mediational studies have been reported to go along with consistently positive clinical outcomes.

This situation creates an opportunity. It now seems possible to examine applied issues with an eye toward whether ACT processes are involved with them, and if so, to predict that ACT intervention methods will make a difference. As an extended example, we will turn our attention to a severe mental health problem, the prevention of suicide. We will first consider what is known about the prevention of this problem, especially among youth, and then will apply an ACT approach to the area.

Suicide Prevention: Current Approaches and Evidence

Methodologically strong studies are in short supply in suicide prevention generally, with the majority of studies lacking the controls required for the data to be useful in identifying evidence-based practices (Rodgers, et al., 2007). Suicide prevention programs take two main approaches (CDC, 1994). *Case-*

finding strategies, such as suicide education, gatekeeper training, and screening, generally based on the notion that students at risk for suicide tend to be under-identified and therefore must be identified and referred to treatment. *Risk factor reduction* programs target the different features tending to put students at risk of committing suicide and include skills training, media education, restriction of means to commit suicide, and crisis intervention (CDC, 1994).

Case Finding Strategies

Suicide education programs have shown mixed results (Gould & Kramer, 2001; Portzky, 2006); sometimes demonstrating improvements in knowledge and attitudes towards suicide as well as help-seeking (Abbey et al., 1989; Cliffone, 1993; 2007; Kalafat & Elias 1994; Kalafat & Gagliano, 1996; Portzky, 2006; Spirito et al., 1988) but other times finding no effect (Shaffer et al., 1990, 1991; Vieland et al., 1991) or even iatrogenic effects (Overholser, Hernstreet, Spirito & Vyse, 1989; Garland & Zigler, 1993; Kalaft & Elias, 1994; Shaffer et al., 1990; Shaffer et al., 1991). Media education programs likewise show both positive (Etzersdorfer et al., 1992; Sonneck, Etzersdorfer, & Nagel-Kuess,1994) and negative (Velting & Gould, 1997) effects

Training gatekeepers to identify those at risk for suicide and refer them to treatment seems to improve knowledge and attitudes regarding suicide, referral skill, and referrals (Garland & Zigler, 1993; Mackesy-Amiti, Fendrich, Libby, Goldenberg & Grossman, 1996; Shaffer, 1988), but the evidence for a reduction in suicides is limited (Kalafat, 2000).. Studies that directly assess adolescents and young adults for factors related to suicide including suicidal ideation and substance use increase care in high school (Reynolds,1991; Shaffer & Craft, 1999; Shaffer et al., 2004) and college (Joffe, 2003) students, but there is the potential for false positives (Shaffer & Craft, 1999; Shaffer et al., 2004) and the success of the program is ultimately dependent on the efficacy of the treatment provided to the identified persons (Gould & Kramer, 2001). Because treatment resources are often limited, case identification could lead to delayed and limited courses of treatment (Schwartz, 2006). As an indication of the problem, the rates of suicidality identified by these methods have already been shown previously to overwhelm institutions, resulting in program abandonment (Hallfors et al., 2006).

Skills Training Strategies

Skills training promotes healthy problem solving, interpersonal, and coping skills, in an effort to reduce suicide. There is some positive evidence primarily in school settings (Eggert, Thompson, Herting & Nicholas, 1995; Klingman & Hochdorf, 1993; LaFramboise & Howard-Pitney, 1995; Zenere & Lazarus, 1997; Orbach & Bar-Joseph, 1993).

Several studies have used a combination of skill training and case finding strategies. A recent review by Rodgers and colleagues (2007) identified three at least as promising: C-CARE/CAST (Thompson, Eggert, Randell & Pike), SOS (Aseltine & DeMartino, 2004), and Reconnecting Youth (Thompson, Eggert & Herting, 2000). However, Halfors et al. (2006) was unable to replicate the findings for Reconnecting Youth in an effectiveness trial and even found evidence of iatrogenic effects. Moreover, all of these studies have focused on only a subset of problems that could lead to suicidality, primarily depression.

In sum, despite the significance of the problem of suicide, the empirical evidence concerning preventive interventions is quite limited. Skills training strategies seem most hopeful, but as this strategy is implemented it targets only a limited number of factors known to predict suicide or suicidality, and has not been shown in a properly conducted RCT actually to reduce the rate of suicides.

The Challenge of Preventing Suicide-Related Behaviors

The study of prevention of suicide and suicidality is difficult for many reasons, including the low base rate of actual suicides

across the population, (Goldney, 2005), the difficulty in operationally defining suicidality and associated behaviors (O'Carrol, Berman, Maris, Moscicki, Tanney, and Silverman, 1996; Silverman, 2006) and the stigma associated with suicide (Lester & Walker, 2006). However, perhaps the biggest challenge is the number of pathways that can lead to suicide (Bertolote, Fleischmann, De Leo, & Wasserman, 2004).

Multiple Pathways to Suicide and Suicidality

Suicide and suicidality is not a specific syndrome with a known and narrow etiology. The pathways associated with increases in suicidality go across the entire range of behavioral and physical health problems. They include drug and alcohol abuse (Mean et al., 2005), affective disorders (Moscicki, 2001), anxiety disorders (Sareen, Houlahan, Cox, & Asmundson, 2005), thought disorders (Siris, 2001), problems in social relationships (Helliwell, 2007), and some physical health problems (e.g., Tang & Crane, 2006). We will briefly consider a range of problems to document that claim, deliberately excluding depression and mood disorders. A comprehensive review could go on for many pages: the point here is the enormous breadth to the range of problems that can lead to suicidality and suicide.

Substance abuse. Over 40% of those attempting suicide have a substance use disorder (Fleischmann, Bertolote, Belfer, & Beautrais, 2005; Mean et al., 2005). Up to 40% of methadone maintenance patients have a history of at least one attempt (Darke & Ross, 2001). Nearly five percent of the students report they had contemplated suicide as a result of drinking and 1.3% attempted it (Presley, Cheng, & Pimenel, 2004).

Psychosis. Patients with psychotic symptoms have significantly higher levels of suicidal ideation even when controlling for depression, hopelessness, substance abuse and social problem solving (Warman, Forman, Henriques, Brown, & Beck, 2004). Between 20% and 50% of those diagnosed as schizophrenic will make a suicide attempt; up to 10% of those with the diagnosis will die by their own hand (Siris, 2001).

Chronic pain. Death by suicide is twice as high for those with chronic pain as those without the diagnosis, even after controlling for depression (Tang & Crane, 2006). Suicidal ideation is two to three times higher (Magni, Rigatti-Luchini, Fracca, & Merskey, 1998).

Anxiety disorders. Data from the National Comorbidity Survey show that after controlling for other major disorders, PTSD is associated with rates of suicidal ideation and attempts that are nearly 3 times higher than above normal (Sareen et al., 2005). In youth and young adults a single anxiety disorder of any kind increases the odds of suicidal ideation by eight times and the rate of suicide attempts by just under six times (Boden, Fergusson, & Horwood, 2007). Controlling for co-occurring mental disorders and life stressors reduced but did not eliminate these relationships.

Epilepsy, diabetes, and other chronic diseases. Suicide is one of the principal causes of death among patients with epilepsy (Nilsson, Ahlbom, Farahmand, Asberg, & Tomson, 2002), with a rate 10 times higher than the general population (Jones et al., 2003); this elevated risk exists even after controlling for psychiatric, demographic and socioeconomic factors (Christensen, Vestergaard, Mortensen, Sidenius, & Agerbo, 2007). Other chronic physical diseases show similar effects. For example, youth with insulin-dependent diabetes mellitus show significantly higher rates of suicidal ideation (Goldston, Kovacs, Ho, Parrone, & Stiffler, 1994).

Burnout. Employment burnout predicts hopelessness and suicidality (Pompili et al., 2006).

Stress. Stress factors significantly increase suicidality among adolescents (Cheng & Chan, 2007).

Obesity. In women, data from the National Mortality Followback Survey show that the Body Mass Index predicts suicidality

(Stack & Lester, 2007).

This is a depressingly long list of factors, and we have hardly begun. Looking at such evidence, Bertolote et al. concluded "Anti-suicide strategies focusing exclusively on the identification and treatment of depression need to be reconsidered. In addition to this, other mental disorders should be targeted … More emphasis should also be placed on psychosocial and environmental interventions diminishing and counteracting stress." (2004, p. 147). A recent review of the data on suicide prevention with youth and young adults concluded similarly: prevention efforts need to find a way to "target mental disorders as a whole" and to "consider contextual factors" (Fleischmann et al., 2005, p. 676).

An ACT-Based Common Core Process Approach

If a common core process existed that affected a wide variety of diagnostic pathways to suicidality and suicide, it might be targeted for change and thus reduce the behavioral impact of problems that have comorbidity with suicidality or suicide. This is not a new idea (e.g., Gray & Otto, 2001) but factors that might be targeted need to pass a stringent set of criteria to be fully useful. To take full advantage of a common core process approach in suicide prevention, processes are needed that a) affect many if not most problem pathways to suicide, b) are malleable, and c) affect outcomes when they are altered. The ACT processes of experiential avoidance (Hayes et al., 1996), cognitive fusion, and psychological inflexibility fit this description.

A Diathesis-Stress Model of ACT Processes

While distinctions can be drawn, as it has been researched, operationalized, and measured (e.g., Hayes, Strosahl et al., 2004), these three ACT processes overlap with several closely-related concepts including lack of distress tolerance (Brown, Lejuez, Kahler, & Strong, 2002), cognitive and emotional suppression (e.g., Wenzlaff & Wegner, 2000), and cognitive entanglement, inflexibility or fusion (Hayes et al., 2006; Maris, 2002) some of which have also been specifically mentioned by suicide researchers as useful avenues to explore (e.g., Gray & Otto, 2001; Maris, 2002) particularly with youth (Brent et al., 2006). In this paper we will use the term "psychological inflexibility" to cover the entire set, and will otherwise list the components of the model.

Psychological inflexibility is associated with a wide range of psychological and behavioral problems, including substance abuse, depression, and anxiety; thought disorders; adjustment to traumatic experiences; adjustment to chronic medical conditions; and school performance; employment performance and burnout (Hayes et al., 1999). A recent meta-analysis (Hayes et al., 2006) showed that AAQ scores could account for 16 to 25% of the variance in behavioral health problems generally.

Psychological inflexibility may be a diathesis making people more vulnerable to a wide variety of stressors. In the absence of stress, a person prone to avoiding unpleasant thoughts and feelings may have little problem. However, when encountering stress, they may lock into self-amplifying efforts to suppress unwanted thoughts and feelings, thus exacerbating their problems.

A number of studies are consistent with this idea. For example, Greco et al. (2005) found that experiential avoidance mediated the relationship between the stress of having a premature birth and parental adjustment and trauma, regardless of the degree of social support or the temperament of the infant. In a series of studies, McCracken and colleagues (McCracken, 1998; McCracken & Eccleston, 2003; McCracken, Vowles, & Eccleston, 2004) found that avoidance of pain and entanglement with pain related thoughts predicted poorer adjustment to chronic pain more so than did actual pain intensity or the degree of physical injury. Lower levels of avoidance was associated with less pain-related anxiety and avoidance, less depression, less physical and psychosocial disability, more daily uptime, and better work status. Similar find-

ings have been shown for the relationship between adult trauma and childhood sexual abuse (Marx & Sloan, 2002; Rosenthal, Rasmussen-Hall, Palm, Batten, & Follette, 2005), combat violence (Plumb, Orsillo, & Luterek, 2004), and others forms of stress (Marx & Sloan, 2005; Plumb et al., 2004). These processes may account for relationships between psychosocial disability and temperamental factors such as high emotional responsiveness (Sloan, 2004), and psychosocial stressors such as the violence faced by inner city youth (Dempsey, 2002; Dempsey, Overstreet, & Moely, 2000).

Through accident, biology, or social disadvantage, some individuals must face much higher levels of psychological pain and distress than others do. In those circumstances, patterns of experiential avoidance and cognitive fusion are ready to create pathological self-amplifying cognitive and emotional processes in which efforts to control or suppress unwanted thoughts and feelings only worsen the thoughts and feelings. In essence, a psychological diathesis of psychological inflexibility (which alone seems to predict poor outcomes) appears to interact strongly with stress from whatever source (violence, loss, life challenges, pain, racism, etc.) to create high levels of behavioral and psychological difficulties.

Suicide and EA. Suicide itself can be thought of as an extreme form of experiential avoidance (Baumeister, 1990; Chiles & Strosahl, 2005): When all other strategies of dealing with an intolerable level of pain seem not to be working, people may begin to look for the ultimate escape. A study by Baumeister (1990) found that the great majority of suicide notes describe emotional escape as the desired function of self-destruction and thus "suicide can be seen as an ultimate step in the effort to escape from self" (p. 90). This same pattern is shown in non-lethal forms of self-injury. For example, Andover et al. (2006) found that self-mutilating college students use emotionally avoidant coping styles more often than students who do not self-injure. Chapman, Gratz & Brown (2006) provided direct evidence that self-harm correlates with experiential avoidance. Data of this kind help link the elements of the analysis presented here. It is not just that experiential avoidance gives rise to clinical problems that in turn lead to suicidality. It is also that suicide and suicidality is an ultimate expression of that same coping strategy.

ACT, Mediation, and Suicidality

It is one thing to show that measures of experiential avoidance, cognitive fusion, or psychological inflexibility correlate with negative outcomes. It is another to show that this process can be successfully modified and that when changed they still affect important outcomes. As shown above, however, the mediating role of changes in these process in ACT has already been shown in over a dozen studies covering such areas as depression, stress, burnout, anxiety, psychosis, pain, disease management, weight management, stigma, and smoking (Hayes et al., 2006). Thus, given that psychological inflexibility is a contributing factor to most of the problems that lead to suicidality, and given that ACT alters them and its outcomes are mediated by these changes, it seems likely that ACT could be used as a preventative intervention to alter the trajectories that are known to lead to suicidality.

ACT may be particularly well suited as a preventative intervention for another reason. ACT is based on the idea that normal cognitive processes can lead to disorders when they are not balanced by acceptance, mindfulness, and values-based skills. The ACT focus on values clarification ("What do you really want in life?) is relevant to all, and the normalization of experiential avoidance and cognitive fusion conveys the broader message that "we are all in the same boat" (Hayes et al, 1999). This non-pathological, non-blaming, values-based approach may help ACT be scaled to fit preventive situations.

There is some early evidence that ACT will be useful in a prevention context. In a ran-

domized trial with 204 high school students, Livheim (2004) found that a nine-hour ACT intervention led to significantly lower depression and anxiety problems as compared to psychoeducation. At a two year follow-up gains with the ACT participants were maintained (Jakobsson & Wellin, 2006; Livheim, 2004).

Conclusion

In this paper we have described the ACT / RFT model of psychopathology and of intervention, and have shown that the evidence so far supports both. Instead of loose extensions of behavioral principles into the area of cognition, ACT and RFT permit a more systematic and precise approach. In this paper we briefly explored the kinds of benefits that a precise model affords to the ability to extend results into new domains, using the prevention of suicide and suicidality as an example.

Based on the existing evidence it seems clear that ACT and RFT will be part of the behavioral and cognitive therapy scene for some time, including in Portuguese speaking countries. How far this new approach can go in creating real progress in applied and basic research will depend not just of the adequacy of these ideas but on their attractiveness to researchers and practitioners around the world. ACT is an open system and its evolution is dependent upon substantive contributions and developments, not on hierarchies. In is in the interests of drawing the serious involvement of Portuguese speaking researchers and practitioners that this article was written

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Received in: 10/15/2007
First editorial decision in: 10/25/2007
Final version in: 11/01/2007
Accepted for publication in: 01/10/2008