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Acceptance and Commitment: Implications for Prevention Science

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Abstract Recent research in behavior analysis and clinical psychology points to the importance of language processes having to do with the control of negative cognition and emotion and the commitment to valued action. Efforts to control unwanted thoughts and feelings, also referred to as *experiential avoidance* (EA), appear to be associated with a diverse array of psychological and behavioral difficulties. Recent research shows that interventions that reduce EA and help people to identify and commit to the pursuit of valued directions are beneficial for ameliorating diverse problems in living. These developments have the potential to improve the efficacy of many preventive interventions. This paper reviews the basic findings in these areas and points to some ways in which these developments could enhance the impact of preventive interventions.

Keywords Acceptance · Commitment · Therapy · Prevention

Behavior analysis and clinical and social psychology have been fruitful sources of preventive intervention development over the last 30 years. Reinforcement techniques that behavior analysts first clarified (e.g., Kazdin 1978) are now used in most empirically supported preventive interventions (Biglan 2003). Classroom-based curriculum interventions employ techniques from social psychology and behavior therapy (e.g., Evans et al. 1977). Refusal-skills training evolved from clinical research on social skills training (e.g., Glaser et al. 1983). Other successful preventive interventions are direct adaptations of clinical interventions. Examples include divorce adjustment counseling (Sandler et al. 1986) and parenting skills interventions (e.g., Andrews et al. 1993). However, some important recent developments in these fields do not appear to have penetrated the field of prevention science.

Over the past 10 years, considerable empirical evidence has accumulated to indicate that humans tend to avoid unpleasant thoughts and feelings and that doing so contributes to a wide range of psychological and behavioral problems. This inclination to avoid unpleasant thoughts and feelings has been labeled *experiential avoidance* (EA). Clinical interventions that reduce EA by fostering acceptance of unpleasant thoughts and feelings and commitment to valued actions have proven effective in reducing a wide range of problems. The evidence points to a need for research on whether reducing EA could prevent many other psychological and behavioral problems.

We first review correlational evidence regarding EA. We then describe Acceptance and Commitment Therapy (ACT), a systematic approach to reducing EA, and then review evidence that this clinical intervention can affect diverse psychological and behavioral problems. Finally, we suggest how to extend this line of work to the prevention of a wide variety of problems.

Experiential Avoidance

Growing evidence suggests that EA is an important risk factor in development of internalizing problems, substance abuse, and possibly externalizing problems. EA is the

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tendency to try to alter the frequency, form, or situational sensitivity of thoughts or feelings, even when doing so causes behavioral difficulties (Hayes et al. 1999a).

Empirical Evidence Regarding Experiential Avoidance

Both correlational and experimental evidence indicate that EA contributes to diverse psychological and behavioral difficulties. Hayes et al. (2006) report a meta-analysis of the relationship between the Acceptance and Action Questionnaire (AAQ) and a wide variety of measures of psychological wellbeing, including psychopathology (e.g., depression, anxiety, PTSD, and trichotillomania), stress, pain, and job performance. Collectively, the 32 studies involved 5,616 participants and 67 correlations between the AAQ and these outcomes. The weighted effect size of these relations was 0.42 (95% CI: 0.40–0.44). In eight studies, it correlated 0.50 with the Beck Depression Inventory (BDI; CI: 0.46–0.054). The average correlation with the General Health Questionnaire (GHQ; Goldberg 1978) was 0.40 (CI: 0.34–0.45) across three studies.

Several studies show that EA as a construct is distinct from other psychological constructs and is associated with a variety of psychological and behavioral difficulties. Bond et al. (under review) reported on the psychometric properties of a 10-item measure of EA, the Acceptance and Action Questionnaire II (AAQ II). Example items are “I’m afraid of my feelings” and “Worries get in the way of my success.” Data came from 2,226 participants. The alpha coefficient for the scale was 0.85. A factor analysis indicated that a single factor accounted for 43.70% of the variance, with all but one item loading above 0.40. The measure did not correlate with a measure of social desirability although it had strong relationships with other measures of psychological functioning. A confirmatory factor analysis, with items from the AAQII, the BDI (Beck et al. 1961), Beck Anxiety Inventory (Beck et al. 1988), the GHQ (Goldberg 1978), Negative Affectivity, and each “Big Five” factor (Goldberg 1993), showed the AAQII measured a construct distinct from those of the other measures. That is, this measure of EA seems to be getting at a process distinct from the psychological processes and behavioral tendencies on which we traditionally focus.

The research includes many longitudinal studies. For example, EA predicts PTSD symptoms over time in trauma survivors (Marx and Sloan 2005). With college students, the AAQ predicted deterioration of quality of life measured a year later (Hayes et al. 2004c). With customer service workers, Bond and Bunce (2003) found the AAQ predicted mental health and computer errors a year later, even controlling for other variables. Those high in acceptance and job control had lower levels of psychological problems and fewer computer errors.

Similar results exist for measures of thought suppression (Wegner and Erber 1992; reviewed below), mindfulness (Baer et al. 2006), distress tolerance (Brown et al. 2005), learned industriousness (Eisenberger 1992), emotionally focused coping (Carver et al. 1989), emotional suppression (Kashdan and Steger 2006), and other acceptance measures (Baer et al. 2006). The ability to have discomforting feelings and thoughts and still take effective action seems to predict success for diverse aspects of human functioning.

Hildebrandt et al. (2007) were able to predict among college students, psychological distress, healthcare visits, and dropouts across college years by combining entering EA levels and emerging life stressors. Materialistic values are associated with diminished wellbeing, and EA mediates this relationship (Kashdan and Breen 2007).

There is less evidence regarding the relationship between EA and externalizing problems such as aggressive social behavior. Tull et al. (2007) found that a nine-item version of the AAQ mediated the relationship between exposure to trauma and self-reported aggressive behavior. Greco et al. (2008) found an adolescent version of the AAQ correlated significantly, but modestly (r=0.11), with teacher ratings of problem behavior in each of two samples. Forsyth et al. (2003) found that EA was related to addiction severity in a sample of substance-abusing veterans.

Rigorous tests of the role of EA in behavior come from experimental studies that reduce EA and then assess its impact on behavior. In a study of pain tolerance, Hayes et al. (1999a) found an acceptance rationale and brief training in acceptance methods produced more pain tolerance than a pain control rationale drawn from cognitive behavior therapy pain management techniques. In a replication (Takahashi et al. 2002), a randomized controlled trial showed this effect depended on a combination of an acceptance rationale plus exercises that taught the new coping methods. A third study (Gutiérrez et al. 2004) found acceptance methods particularly worthwhile when pain was severe.

A randomized laboratory experiment with 60 panic disorder patients (Levitt et al. 2004) evaluated whether reducing EA would affect the tendency to panic. It compared effects of a brief instruction and exercise focused on accepting feelings to suppression and distraction conditions in response to a CO_2 gas challenge that induced panic-like symptoms. Acceptance instructions led to significantly less anxiety than did the other conditions during the gas challenge and to a greater willingness to participate in a second challenge. Similarly, Marcks and Woods (2005) showed that EA exacerbated the impact of negative thoughts but that a brief acceptance intervention reduced psychological distress due to the thoughts.

The strongest evidence of the importance of EA comes from randomized trials evaluating acceptance-based inter-

ventions. We review this evidence below. Much of it shows, not only that acceptance interventions reduce EA and improve psychological functioning, but also that changes in EA mediate the improvements in functioning.

Research by social psychologists also supports the idea that efforts to control unwanted thoughts and feelings can be problematic. Instructions to suppress thoughts and verbal responses increase the occurrence of those thoughts and responses (Wegner and Erber 1992). Wegner et al. (1993) found that, when people try to think of happy or sad events but not to have feelings associated with the events, they could not do so under conditions of cognitive load (having to remember a nine-digit number). Wegner (1994) argues that this occurs because conscious efforts to control or suppress thoughts involve having a rule present about not thinking a thought that the rule itself contains.

A Diathesis-Stress Model of Experiential Avoidance

EA seems to be a diathesis making people more vulnerable to a variety of stressors. Someone prone to avoid unpleasant thoughts and feelings may lock into self-amplifying efforts to suppress such experiences when stressful events—of whatever nature—bring distress into their lives. Such a process could help account for why EA is related to so many different problems. Whether a struggle not to feel distress begins from failure in school, the loss of a loved one, or a difficulty on the job, efforts to control it exacerbate the distress that struggle engenders. A number of studies support this idea.

Greco et al. (2005) found that, among mothers experiencing the distress of preterm birth, EA mediated the relationship between their stress and their subsequent adjustment. In a series of studies, McCracken and colleagues (McCracken 1998; McCracken and Eccleston 2003; McCracken et al. 2004) found that a pain-specific version of the AAQ predicted adjustment in chronic pain patients more than did actual pain intensity or extent of injury. Greater acceptance of pain and willingness to act even when pain was present were associated with less pain-related anxiety and avoidance, less depression, less physical and psychosocial disability, more daily uptime, and better work status. Similar findings have been shown for the relationship between adult trauma and childhood sexual abuse (Marx and Sloan 2002; Rosenthal et al. 2005), combat violence (Plumb et al. 2004), interpersonal violence (Orcutt et al. 2005), and several others forms of stress (Marx and Sloan 2005; Plumb et al. 2004).

EA also seems to mediate the effects of stress on subsequent functioning. Due to biological stressors like physical pain or injury (McCracken et al. 2004), temperamental factors like high emotional responsiveness (Sloan 2004), or psychosocial stressors like the violence faced by inner-city youth (Dempsey 2002; Dempsey et al. 2000), people seem to learn EA as a coping mechanism.

However, regardless of what prompts a person to become experientially avoidant, EA has longer term negative effects. This is because it seems to narrow a person's repertoire for dealing with his or her environment and because many methods of EA (e.g., substance use, social withdrawal, or high-risk sexual behavior) produce negative social, psychological, and physical effects. These two processes—stressful events making EA more likely, and EA leading to poor outcomes (including more stress) regardless of its source—define what is necessary statistically for EA to serve as a mediator of the impact of stressful events on pathology. Various studies (e.g., Kashdan et al. 2006) have found exactly that.

Further empirical evidence is necessary to test the mediating and moderating role of EA. Such research will clarify the extent to which those already prone to EA are more likely to develop psychological and behavioral problems when they encounter stress. If the model above is correct, however, the self-amplifying nature of EA means that even lower levels of stress can put individuals at risk for the development of difficulties.

Relationship to Other Models of Coping

Greco et al. (2008) point out that most existing approaches to coping do not directly assess people's acceptance of experiences associated with stress. Rather they assess the ways in which people try to cope and whether they engage in active efforts to solve problems or avoid distress through distraction, positive thinking, thought replacement, or self-talk. Further, they assess passive-avoidant reactions such as withdrawal. Still, all these measures focus on attempts to *regulate or control* private events and do not directly assess people's *willingness* to have these experiences. However, the specific approaches people use to react to distress may be less important than their willingness to experience private events fully without efforts to minimize them. In line with this view, EA may mediate the impact of a variety of coping and emotional regulation processes, including cognitive reappraisal, controllability of stressors, anxiety sensitivity, and emotional response styles (Kashdan et al. 2006).

Rothbaum et al. (1982) propose that, besides making efforts to control their environment, people engage in "secondary" control in which they bring their thinking in line with the realities of their situation, by characterizing a situation as beyond their control, or involving luck or powerful others. However, whether people engage in primary or secondary means of control may not be as important as their willingness to accept the feelings that

arise when they are unsuccessful in efforts at control. This may be one reason why EA mediates the positive impact of cognitive reappraisal (Kashdan et al. 2006): It is helpful only to the degree that it leads to a more flexible and accepting stance on cognition.

The EA construct may also shed light on resilience (e.g., Luthar 1991; Luthar et al. 1993; Masten et al. 1990, 1999). Those low in EA may be more resilient because they do not lock into self-amplifying efforts to control unpleasant experience. Among the elderly, psychological acceptance is associated with greater resilience and quality of life (Butler and Ciarrochi 2007). Indeed, some measures of psychological resilience contain measures of psychological acceptance (e.g., Schumacher et al. 2005), and, in prospective studies of adjustment to death and loss, acceptance is a predictor of resilience (Bonanno et al. 2002). Prevention researchers may be able to inoculate people against the harmful impact of many types of adversity by increasing their acceptance of the distress that naturally results from adversity.

Implications for Risk Factor Research

The evidence we review makes clear that EA is associated with a wide variety of psychological problems. However, only a few of the studies conducted so far involve longitudinal data (Bond and Bunce 2003; Hayes et al. 2004c; Marx and Sloan 2005; Plumb et al. 2004). Moreover, large-scale, population-based studies are essential to determine the prevalence of EA and allow calculation of the population-attributable risk of EA for the diverse problems with which it is correlated. If EA is a risk factor for diverse problems, research on the factors influencing its development will be crucial. These might include studies of the influence of schools, families, and the media.

Acceptance and Mindfulness-Based Clinical Interventions

Research on EA accompanies an even more substantial body of clinical research. Over the past 15 years, the focus within behavior therapy has shifted from assisting clients in controlling emotions and cognitions to acceptance, mindfulness, and values-based behavioral persistence and change (Hayes 2004). Examples of this work include Dialectical Behavior Therapy (Linehan 1993), Functional Analytic Psychotherapy (Kohlenberg and Tsai 1991), Integrative Behavioral Couples Therapy (Jacobson and Christensen 1996), and Mindfulness-based Cognitive Therapy (Segal et al. 2002), among several others (e.g., Marlatt 2002; Martell et al. 2001; McCullough 2000; Roemer and Borkovec 1994). These new methods seem particularly relevant to prevention because they involve broad models of how to live more effectively rather than focusing on elimination of pathology per se. Here we describe the most extensively researched of these approaches, Acceptance and Commitment Therapy, or ACT (Hayes et al. 1999b).

Several book-length descriptions of ACT exist (e.g., Dahl et al. 2005; Hayes et al. 1999a, b; Hayes and Strosahl 2005; Luoma et al. 2007) so here we provide only a brief description. Figure 1 illustrates the ACT intervention model. ACT employs a set of metaphors and experiential exercises to assist people in getting out from under the rigid control of verbal rules that cause them difficulty. It consists of six strands, each with the goal of increasing psychological flexibility—the ability to contact the present moment more fully as a conscious human being and to change, or persist in, behavior when doing so serves valued ends.

Acceptance Acceptance involves the active embrace of private events without needless attempts to change the frequency or form of those events, especially when doing so would cause harm. Acceptance is not an end in itself but a method of increasing values-based action. Clients contact the ways in which they try to control their experiences, the workability of those efforts, and the possibility that letting

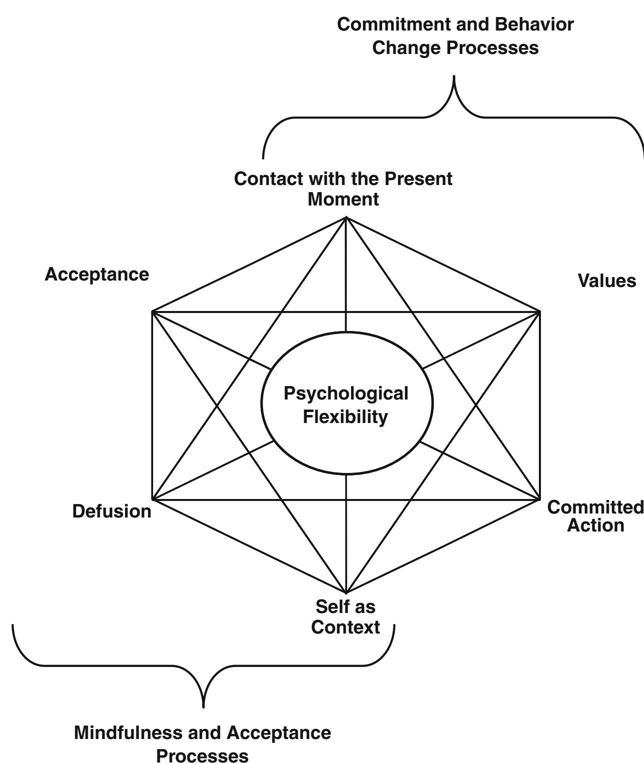

Fig. 1 ACT intervention model

go of control and accepting uninvited experience may not bring on the catastrophe they have been trying so hard to avoid. This metaphor aptly illustrates this idea:

> Imagine being hooked to a polygraph that can detect the slightest emotional arousal. You don't want to be aroused and we don't want you to be aroused. And just to make sure you are motivated, I am going to put this gun to your head and I will pull the trigger if you show any signs of emotion.

Most people can readily see how their efforts often function just this way. If they do not want a thought or feeling, that is exactly what they will have. By discussing their own control efforts supportively and gently, clients begin to see that, although rules work quite well in dealing with the world outside the skin, they do not work when applied to private experience. This helps people see that efforts at control are common. In the very nature of being a language-able human, we work to control our world. Our culture has taught us to use language for control.

In ACT, people learn to study their experiences to see if their current efforts at control, in fact, work. It is important to note the emphasis on assessing one's own experience and not on trusting the therapist's statements. If this analysis is correct, a person's problem is trying to follow others' rigid rules. This therapy is about loosening control so that clients can respond more flexibly to an ongoing experience. ACT therapists often say, "I'm not asking you to believe me. I'm asking you to examine your experience and see if your efforts to control really work." One metaphor used to encourage acceptance goes something like this:

> Imagine you decided to have a house party and invite everyone in the neighborhood. You even put up a sign at your local grocery store. The party is starting out nicely, with friends and acquaintances arriving in a jovial mood. Then, there is a knock at the door. It is the bum who lives in the dumpster down at the grocery store. You really don't want him there. You could simply close the door and lock it, but you'd have to stay there to let others in.
>
> Isn't there a sense in which you could—despite your irritation and embarrassment—welcome him in? Couldn't you—regardless of how you feel—say, "Come in. Make yourself at home. Have something to drink. Snacks are over here." Of course, you may not like having him there. Yet maybe that feeling is just another bum at the door, and you can welcome him in too.

The ultimate goal of this process is to increase people's willingness to have thoughts, feelings, and other experiences they work hard to avoid. Clients work through exercises and metaphors that provide a context for experiencing their most common and troublesome thoughts and feelings without taking those experiences literally or trying to avoid or control them.

Cognitive defusion Cognitive defusion techniques attempt to alter undesirable functions of thoughts and other private events, rather than to alter their form or frequency. ACT attempts to change the way one *interacts with* or *relates to* thoughts by creating contexts in which their unhelpful functions weaken. There are scores of such techniques (Hayes and Strosahl 2005). For example, one could dispassionately watch a thought, say it aloud repeatedly until only its sound remains, or treat it as an external object by giving it shape, size, color, speed, or form. One could thank her mind for such an interesting thought, label the process of thinking ("I am having the thought I am no good"), or examine feelings and memories that occur while thinking it. Such procedures attempt to reduce the literal quality of the thought, weakening the tendency to treat it as what it refers to ("I am no good") rather than what it is directly experienced to be (e.g., the thought that 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 the frequency of these events.

Self as context A behavior-analytic analysis of verbal behavior and the self (e.g., Hayes et al. 2001) points to three aspects of the self. The *conceptualized self* involves one's tendency to ascribe characteristics to self. Literality and fusion typically characterize this process. Since statements such as "I am good" and "I am male" have the same form, people tend to treat both as if they are literally true. Hayes et al. (1999a, b) suggest that psychological distress arises when people take self-descriptions literally and are motivated to control them. A second sense of self—*the self as process*—involves ongoing experiences and our awareness of them, which plays an important role in guiding our own behavior. The tendency to suppress or avoid awareness of aspects of our experience can impair our ability to cope.

The third sense of self is as an *observer*. The therapist uses exercises to help people experience the sense that this "self" is a safe place from which to experience all wanted and unwanted life experiences, since it remains unchanged. The therapist may ask, "Even when you are very anxious, isn't there a sense in which you are the same person who is lying in bed relaxed on a Saturday morning?" The ACT therapist tries to create a context in which clients experience this sense of self so they can begin to experience emotions, thoughts, and self-attributions as things that happen to them rather than as literal characteristics they possess and must control.

Contact with the present moment 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 their behavior becomes more flexible and their actions more consistent with their values. They achieve this by allowing contact with what works to exert more control over behavior and by using language as a tool to note and describe events, not just to predict and judge those events. The sense of self as process is actively encouraged: the defused, non-judgmental, ongoing description of thoughts, feelings, and other private events.

Values If people abandon efforts to control, what will guide them through life? The ACT valuing strand helps people to clarify what is important and to choose directions they want to go. Often ACT therapists begin therapy with a focus on this issue. They contrast "where you want to go in life" with "your current struggle not to have bad feelings." Here too, the therapist reminds the client that *valuing* is not a matter of having strong feelings about wanting to move in certain directions. It is a matter of consciously choosing to take action in valued directions—whatever thoughts and feelings accompany the action. People learn that they can choose a course of action, even when they have many reasons why they cannot or should not pursue that action. One values exercise has people imagine how they would like people to remember them after they have died.

ACT helps people clarify values in nine domains: (1) marriage/couples/intimate relationships; (2) family relationships; (3) friendship/social relations; (4) career/employment; (5) education/personal growth and development; (6) recreation/leisure; (7) spirituality; (8) citizenship; and (9) health/physical wellbeing. People then receive help with clarifying goals consistent with their values. From the ACT perspective, the values we set define directions in which we want to move, and life is far more about the process of moving in those directions than reaching a goal. Pursuing goals may facilitate valued living, but a value defines a way of living, not an end.

Committed action This involves helping people commit to actions consistent with their values. Unlike most other aspects, which focus on undermining control of verbal rules (e.g., "I must not feel anxious"), this strand increases the extent to which people behave under the control of verbal rules. However, here people construct the rules for their own chosen valued directions. An ACT metaphor, *The Monsters on the Bus*, illustrates the concept of pursuing valued actions in the context of having unwanted thoughts and feelings.

> Imagine you are a bus driver with a bus headed in a valued direction. However, a bunch of really scary passengers gets on the bus. They are thoughts, feelings, bodily states, memories—all the ones that you really don't want. You make a deal with them. You tell them that if they sit quietly and don't bother you, you will drive the bus where they want to go. Whenever they say "Turn left!" you turn. The trouble is that your bus is not going where you want it to go. The trick is, though, the only reason they have control over you is that you don't want to see or hear them. But the fact is they cannot really harm you. They say they can; your mind tells you they can; but they cannot. They are mostly just words. Maybe—consider the possibility—all the effort you put into controlling these critters isn't needed—you can let them come on up and you can drive your bus wherever you choose to go.

Committing to the action that moves in a valued direction is likely to bring up the thoughts and feelings that have halted action in the past. The key question is, "Are you willing to do what would work to enhance your life and to have whatever thoughts, feelings, or memories arise as you do it?" Willingness is not the same as wanting. A person may not want to do something they have chosen to do. They can do it nonetheless.

The Efficacy of ACT

Two recent reviews summarize results of randomized trials (Hayes et al. 2004b, 2006). The studies address a broad range of problems, including substance abuse, chronic pain, anxiety, depression, psychosis, smoking, prejudice, worksite stress, employee burnout, diabetic self-management, adjustment to cancer, self-harm, obsessive compulsive disorder, trichotillomania, and epilepsy, among others. Hayes et al. (2006) reported a meta-analysis of 21 randomized trials of ACT. The average effect size (Cohen's *d*) was 0.66 at post treatment (N=704) and 0.65 (N=580) at follow-up (on average 19.2 weeks later). In studies involving comparisons between ACT and active, well-specified treatments, the effect size was 0.48 at post (N=456) and 0.62 at follow-up (N=404). In comparisons with wait list, treatment as usual, or placebo treatments, the effect sizes were 0.99 at post (N=248) and 0.71 at follow-up (N=176).

We will describe several studies to characterize more fully the nature of the current ACT outcome literature and to give some sense of the breadth of problems it addresses. This breadth of application is a major reason for believing that the processes ACT targets may be of general relevance to prevention science.

In a randomized controlled trial focused on workplace stress management (Bond and Bunce 2000), 90 workers at a media group (45 of each gender) were randomly assigned

to an ACT protocol (n=30; Bond and Hayes 2002), a behavior-oriented Innovation Promotion Program (IPP) to encourage them to identify and change stressful events at work (n=30), or a wait list control (n=30). Each intervention consisted of three half-day group sessions spread over 14 weeks. ACT demonstrated significantly greater improvements than the IPP and control groups did in a general measure of stress and psychological health at post and at 3-month follow-up. Both interventions were equally effective compared to the wait list in increasing the propensity to take concrete action to reduce worksite stressors, even though the ACT condition did not target this explicitly. An increased acceptance of undesirable thoughts and feelings mediated the outcomes achieved by the ACT intervention, but not by the IPP condition.

Gifford et al. (2004) randomized 67 smokers either to Nicotine Replacement Therapy or to seven individual and seven group sessions of ACT. ACT had significantly better smoking cessation outcomes (35% vs. 15%) at 1-year follow-up. A decreased need to avoid smoking-related thoughts and feelings in order to maintain abstinence mediated outcomes in the ACT group, passing all of Baron and Kenny's (1986) steps for mediation.

One study of opiate-addicted polysubstance abusers compared methadone maintenance alone to methadone maintenance plus 16 weeks of either Intensive 12-Step Facilitation or ACT (Hayes et al. 2004d). ACT recipients had lower objectively assessed opiate and total drug use during follow-up than those on methadone maintenance alone, and had lower subjective measures of total drug use at follow-up. An intent-to-treat analysis provided further support for decreases in objectively assessed total drug use in the ACT condition.

Burnout is common among drug and alcohol abuse counselors, which may be due to a tendency to experience and then seek to suppress negative attitudes about clients (Corrigan 2002). Hayes et al. (2004d) reasoned that ACT training could help counselors accept their thoughts as thoughts, experience them as less believable, and recommit to their values in helping clients. They randomly assigned counselors to receive a 1-day workshop on ACT, Multicultural Training (a common approach to reducing negative attitudes toward stigmatized groups), or a class on biological processes of addiction. At follow-up, ACT recipients had lower scores on a burnout measure than did those in the other conditions. For the ACT recipients, belief in stigmatizing attitudes mediated their improvement.

Bach and Hayes (2002) evaluated a 3-hour ACT intervention for hospitalized patients with hallucinations or delusions. By random assignment, 80 patients received either the brief ACT intervention or usual care. The ACT intervention focused on accepting—rather than trying to control—hallucinations and delusions, mindfully viewing them as psychological events that come and go, and focusing on the behaviors needed to achieve valued ends. Those who received ACT had significantly lower rates of rehospitalization over 4-month follow-up, but they did not have lower rates of symptoms. Among those receiving ACT and admitting symptoms, the rehospitalization rate was below 10%, but among those who denied symptoms it was 40%. ACT participants also showed much lower levels of believing their symptoms. Among those in usual care, belief in symptoms did not change and, unlike in the ACT condition, admitting symptoms did lead to a return to the hospital.

The ACT website (www.contextualpsychology.com) includes a list of empirical papers on the effects of ACT.

Relational Frame Theory

The applied research described thus far runs parallel to a substantial body of basic research on human language. Space precludes a full discussion of this work, but it has been pivotal to the progress already made in understanding how and why humans lock themselves into patterns of EA, and in learning how they can free themselves from these struggles.

Relational Frame Theory (RFT; Hayes et al. 2001) views the core of human language and cognition as the learned ability to relate events arbitrarily, mutually and in combination, and to change the functions of these events based on those relational responses. For example, very young children learn that a nickel is larger than a dime in terms of physical size, but not until later will they develop the relational ability to apply the relation of comparative *value* to these coins arbitrarily, when the child will label a dime as "bigger" than a nickel. Because of this relational response, a dime comes to have a greater reinforcing function than a nickel does. In 20 years of literature spanning over 70 empirical studies, RFT researchers have shown that relational responding is a fundamental and learned feature of language (e.g., Barnes-Holmes et al. 2004; Berens and Hayes 2007; Devany et al. 1986; Lipkens et al. 1993). They show that a wide variety of cognitive processes involves relational responding (Hayden et al. 2005) and, most importantly, relational responding transforms the functions of stimuli and alters other behavioral processes, such as operant conditioning or classical conditioning (e.g., Dymond and Barnes 1995). For example, consider a person who learns a relational network between three arbitrary stimuli: $A < B < C$. If we now pair "B" with shock, "C" will elicit far more arousal than B, even though no one paired it with shock (Dougher et al. 2007). These findings show that, when human beings learn to compare events, related events can change their functions, even if the

comparisons are arbitrary and there is no direct basis for the resulting functions.

Because such relational skills are massively useful, once learned they become more and more dominant in behavioral regulation; the world as verbally constructed becomes the world in which humans live. ACT/RFT theorists have labeled the tendency for people to live in a verbally constructed world, while not noticing the role of verbal constructions in their experience as "cognitive fusion." This domination is not without cost. Verbally regulated behavior tends to be less flexible, less modifiable by experience, and at times less effective than behavior shaped by experience (see Hayes 1989, for a book-length review). When applied to private experiences, these relational skills lead to experiential avoidance. Thanks to cognitive fusion our *thoughts* about distress—not just the distress itself—become something to avoid. As noted above, efforts to suppress thoughts actually evoke them, while simultaneously increasing their importance. Failing to control unwanted thoughts and feelings, we may drink or take drugs to avoid feelings. We may move away from, divorce, or even kill people who put us in touch with images, thoughts, or beliefs that we "just cannot stand."

This line of thinking makes sense of data that have long been central to a prevention science perspective. When we consider the lifetime incidence of *any* DSM disorder, or the rates of physical abuse, divorce, sexual concerns, and prejudice, it is hard to conclude that psychological suffering and behavioral difficulties characterize only a small minority of human beings. Even such seemingly severe processes as entanglement with suicidal thoughts affect a majority of human beings at some point in their lives (Chiles and Strosahl 2004). Hayes et al. (1999a) argue that, contrary to traditional nosological thinking, the ubiquity of human psychological suffering occurs because normal and essential human verbal abilities contain within them tendencies toward cognitive fusion, experiential avoidance, and psychological inflexibility. Although our verbal abilities are fundamental to our ability to control the world around us, they become counterproductive when applied to private experience.

Implications for Strengthening Preventive Interventions

Parenting Skills Interventions

Training of behavioral parenting skills has become the treatment of choice for child behavior problems (Biglan et al. 2004). However, most interventions could have a greater impact (e.g., Barrera et al. 2001, 2002). For the most part, these interventions concentrate on teaching specific parenting skills and pay less attention to parents' thoughts and feelings or to their values. When they do address parents' thoughts and beliefs, they commonly advise parents to control negative thoughts about their children. Suggested strategies include "soothing self-encouragement," refutation of upsetting thoughts, and visualizing positive outcomes. From an acceptance perspective, these approaches imply that such thoughts are the reasons for parents' inappropriate practices (e.g., "he made me so angry, I started yelling"). If emerging evidence from ACT research is correct, such strategies are counterproductive; they intensify negative thoughts and distract parents from using newly acquired parenting skills in service of their values as a parent.

ACT encourages parents to accept upsetting thoughts and feelings that often accompany parenthood, but gently challenges the assumption they must eliminate those thoughts before they can parent effectively. Exercises and metaphors, as described above, help parents notice and accept their thoughts and feelings as they interact with their children, and take those thoughts less literally. ACT helps parents clarify their values about relationships with their children and their children's direction in life. It facilitates their being "in the moment" with their children.

Blackledge and Hayes (2006) examined the impact of ACT on parents of autistic children in a within-subject design. ACT reduced parental depression and distress. A small series of case studies provided some evidence that mindfulness training with parents led to reductions in child aggression, non compliance, and self-injury (Singh et al. 2006).

It may also be important to examine whether parenting interventions should focus on changing the ways parents socialize their children regarding ways of responding to emotions and negative cognitions. For example, if parents receive assistance in helping children to label their emotional reactions accurately, accept them, articulate valued ways of behaving, and support action in keeping with values, even in the face of negative emotions, it could improve the outcomes of parenting skills training programs (Murrell et al. 2005).

Interventions Targeting Adolescents

Existing evidence suggests that EA is an important, but previously undiscerned, psychological process among adolescents. Interventions that foster acceptance of negative thoughts and feelings and commitment to valued action could contribute to the prevention of a wide range of problems.

Perhaps the most important pathway to adolescent problem behavior is through deviant peer influences (Biglan et al. 2004). Social rejection, including teasing and harassment, heightens susceptibility to peer influence (Patterson et al. 1992; Rusby et al. 2005). A likely

mechanism subserving this process is the worry and distress such rejection causes an adolescent. Teasing and harassment, which escalate in middle school (Gottfredson et al. 1993), likely increase adolescent worries about social acceptance. Are they sufficiently masculine or feminine? Are they dressed right? Presumably, many teens worry about these issues and take them quite literally. It is not that your peers might think you uncool; it is that you might actually *be* uncool.

As noted above, a recent paper by Greco et al. (2008) reported that an adolescent version of the AAQ, the *Avoidance and Fusion Questionnaire*, was correlated with a variety of measures of adolescent psychological and behavioral functioning. This suggests that, in the context of peer teasing and harassment, students are most vulnerable if they engage in EA.

Current classroom-based approaches to preventing tobacco and other substance use train students in social skills for resisting peer influences (e.g., Botvin et al. 1990; Sussman et al. 1993). However, these programs might become stronger with the addition of acceptance and defusion components of ACT as well as by activities that foster committed action in the service of important values. Exercises that foster adolescents' acceptance of unpleasant thoughts and feelings and defusion from them may reduce the influence of such thoughts over behavior. Helping adolescents define valued directions they want to take in their lives may orient them toward action that is not about fitting in with peers. Strengthening these processes could inoculate adolescents against peer influences to engage in the entire range of problem behaviors.

One problem with much prevention research is its failure to link interventions clearly to hypothesized mediating psychological processes and hypothesized mediators to behavioral and psychological outcomes (Eddy 2006). The present analysis proposes clear links between acceptance-based intervention processes, reductions in EA, resistance to peer influences, and reductions in diverse problem behaviors.

To date, there are limited data on ACT interventions with children and adolescents. Wicksell et al. (2007) reported substantial improvements for 14 adolescents with chronic pain (effect sizes ranging from 0.47 to 1.53). Metzler et al. (2000) reported a randomized trial that employed ACT as part of a program that reduced high-risk sexual behavior in adolescents.

The Prevention of Depression

ACT may also be valuable for improving the efficacy of depression prevention interventions. The Horowitz and Garber (2006) meta-analysis of depression prevention among studies of children and adolescents reported small but significant effects for selective interventions (mean effect size=0.30) and indicated interventions (mean effect size=0.23). One of the most common approaches to the prevention of depression involves cognitive behavior therapy in which people learn to modify depressogenic thoughts (Clarke et al. 1995, 2001; Gillham et al. 2006; Muñoz et al. 1995; Seligman et al. 1999). For example, Seligman et al. (1999) report on an intervention with topics including "(a) the cognitive theory of change; (b) identifying negative thoughts and underlying beliefs; (c) marshaling evidence to question and dispute automatic negative thoughts and irrational beliefs; and (d) replacing automatic negative thoughts with more constructive interpretations, beliefs, and behaviors...." [no page number given].

ACT takes a distinctly different perspective. Rather than encouraging people to dispute and try to get rid of negative thoughts, it encourages them to accept whatever thoughts they have, but to look at them as thoughts, not as accurate descriptions of their situation or the world. Through acceptance and defusion, the influence of such thoughts diminishes, even if the frequency remains unchanged.

Two lines of evidence are consistent with the possibility that this is a more fruitful approach to preventing (and treating) depression. First, ACT seems to have an equal (Forman et al. 2007; Zettle and Rains 1989) or greater (Lappalainen et al. 2007; Zettle and Hayes 1986) impact on depression as compared to traditional cognitive-behavioral treatment. In these studies, ACT effects were mediated by EA and related ACT processes. That is not true with the processes altered by traditional CBT methods. Second, recent component analysis studies comparing behavioral activation (in which people are encouraged to become more active, but do not receive cognitive intervention) with full-blown cognitive-behavior therapy have shown that behavioral activation is as effective (Gortner et al. 1998; Jacobson and Christensen 1996) or more effective (Dimidjian et al. 2006) than traditional cognitive behavior therapy. The ACT focus on values and commitment, coupled with acceptance and defusion, orients people to take action in the service of their values, which may be particularly valuable in preventing the onset of depression, when stressful events occur.

ACT in Education

A few small studies are occurring on ACT's impact in educational settings. For example, one recent study found that a randomly assigned (but required) high-school ACT health class led to lower levels of stress and anxiety at a 1-year (Livheim 2004) and 2-year (Jakobsson and Wellin 2006) follow-up. Increased acceptance mediated the changes.

Acceptance, defusion, and mindfulness are teachable skills. In addition, there seem to be fewer barriers in schools to teaching them instead of other functionally similar methods, such as meditation, that the public often links to specific religions (e.g., Buddhism).

ACT is also relevant to dealing with the stress problems of teachers. Compared with the general population, teachers are at higher risk for psychological distress and low job satisfaction (Schonfeld 1990). Teachers in schools with high levels of misbehavior and other stressful conditions experience more stress and burnout (Abel and Sewell 2001). Addressing the stress problems of teachers may be important for improving education, keeping teachers in the field, and improving the quality of their lives. ACT has already been shown to reduce stress and burnout among drug abuse counselors (Hayes et al. 2004a) and call center employees (Bond and Bunce 2000, 2003), so it should be evaluated for teachers. Evidence that ACT can increase counselors' use of evidence-based practices (Varra et al. in press) suggests that it may be instrumental in influencing teachers to try the evidence-based practices.

ACT may also be useful in preventing problems among college students. Most colleges and universities conduct freshman orientation classes that include material on stress in college life. It is common for these classes to include material on emotional intelligence or healthy thinking styles, but there is more support for the value of ACT (e.g., Donaldson and Bond 2004).

ACT at Work

A number of randomized trials have already shown the benefit of ACT in the workplace (Bond and Bunce 2000; Hayes et al. 2004a). Acceptance and mindfulness seem to predict not only fewer health problems but also higher work performance (Bond and Bunce 2003; Donaldson and Bond 2004). Other randomized trials have shown ACT to prevent pain-related worker disability and to have a dramatic effect on absences associated with illness (Dahl et al. 2004). Prevention scientists have done relatively little work on prevention in the worksite. These findings suggest a strategy that could greatly expand the ability of prevention scientists to make a difference in work settings.

ACT in Medical Care

Traditional psychological models do not fit well with the time demands of primary medical healthcare, but as it is possible to disseminate the core ACT message in short interventions, the fit between ACT and pragmatic normal healthcare is good. For example, in one randomized trial, Gregg et al. (2007) added 3 hours of ACT training to patient education received at a public health clinic by poor and mostly minority patients with Type II diabetes (N=81). After 3 months, ACT outperformed education alone on changes in self-management behavior and percentage of patients in blood glucose (HbA_{1C}) control. Mediational analyses showed that diabetes-related acceptance and action, combined with self-management, meditated blood glucose control.

Lundgren et al. (2006) conducted a small randomized trial (N=27) comparing ACT to an attention placebo for poor, institutionalized South African epileptics who were receiving medical care for their seizures. A 9-hour ACT intervention reduced the total time per month seizing by over 95%. The participants maintained these improvements over 1 year. Equally important, by integrating ACT into medical care, patients began a new path in their lives more generally. At post, there was no improvement on the WHO Quality of Life Scale, but people who received ACT began to improve at 6-month follow-up, and showed large and significant changes at 1 year (between condition Cohen's d for the overall scale=0.28, 0.51, and 1.59 across post and 6-month and 1-year follow-up, respectively, with similar findings on all four subscales). ACT produced very large improvements at post and each follow-up in a specific epilepsy-focused version of the AAQ (between condition d above 2.8 at all times), measures of changes in values attainment, and persistence in the face of psychological barriers, which fully mediated both seizure improvements and quality of life improvements seen a year later.

Given these kinds of results, it seems important to develop and test short applications of the ACT model in primary healthcare and to test the ability of these strategies to increase adherence to medical regimens and to prevent problems beyond the specific areas addressed.

Implications for Policy

To the extent that EA and its converse, acceptance, are shown to be important for human wellbeing, it will be important to examine how public policy affects them. For example, our society makes extensive use of punishment in order to deal with undesirable social behavior (Biglan 1995). Often the punishment process communicates to people that they should not engage in the behavior and, in the context of a culture that teaches that behavior is due to thoughts and feelings, the message is implicit that people should control their thoughts and feelings. Acceptance research suggests that this may only heighten an offender's experience of thoughts and feelings associated with engaging in the unwanted behavior and which the offender feels makes the behavior irresistible. Research might explore if our policies for dealing with those who break the law or school rules should include a process of fostering acceptance.

The Potential of Acceptance-Based Strategies

The developments we review here hold a promise of improving the precision and impact of prevention research. Many of the most successful strategies of prevention interventions arose from cognitive behavior therapy and basic and applied behavior-analytic research. However, the past 20 years have found substantial room for improving our preventive interventions and, until lately, it has been unclear from where new initiatives might arise. The evidence we review here indicates that recent research in behavior therapy and verbal behavior have delineated a core verbal process—EA—as a risk factor for a wide range of human problems. Interventions that help people to accept difficult thoughts and feelings and focus on effective action show great promise for increasing the efficacy of our interventions. We might examine a variety of related concepts in the ACT work and related approaches (e.g., values attainment, focus on the present, mindfulness) for possible sources of new prevention approaches.

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