First-line Treatment: A Critical Appraisal of Cognitive Behavioral Therapy Developments and Alternatives

Joanna J. Arch, PhD[a,*], Michelle G. Craske, PhD[a,b]

Behavioral and cognitive behavioral therapies (CBT) introduced time-limited, relatively effective treatments for anxiety disorders. As a result of ease and efficacy of delivery, CBT developed into the dominant empirically validated therapy for anxiety disorders. This article presents a brief, up-to-date assessment of the successes and challenges of CBT for anxiety disorders. We present a definition of CBT, discuss treatment components, recommendations, and contraindications, review treatment efficacy, and consider multiple remaining challenges, including attrition, long-term follow-up, co-occurring disorders, active treatment comparisons, mediators of change, and broader implementation. We also integrate recent developments in CBT and alternative therapies, including the new science of exposure, unified treatment protocols, and mindfulness and acceptance-based treatments.

COGNITIVE BEHAVIORAL THERAPY DEFINED

Craske[1] defines CBT as follows:

> CBT is an amalgam of behavioral and cognitive interventions… guided by the principles of applied science… The behavioral interventions aim to decrease maladaptive behaviors and increase adaptive ones by modifying their antecedents and consequences and by behavioral practices that result in new learning. The

[a] Department of Psychology, University of California Los Angeles, 1285 Franz Hall, Los Angeles, CA 90095 1563, USA

[b] Department of Psychiatry and Biobehavioral Sciences, University of California Los Angeles, 760 Westwood Plaza, Los Angeles, CA 90095, USA

* Corresponding author.

E-mail address: jarch@ucla.edu (J.J. Arch).

> *cognitive interventions aim to modify maladaptive cognitions, self-statements or beliefs… The hallmark features of CBT are problem-focused intervention strategies that are derived from learning theory [as well as] cognitive theory principles…*

Therefore, cognitive and behavioral therapies for anxiety disorders aim to help clients reduce distress by changing cognitive and behavioral responses.[2,3] The treatment components of CBT for anxiety disorders vary by the specific intervention but include various combinations of the following: psychoeducation about the nature of fear and anxiety, self-monitoring of symptoms, somatic exercises, cognitive restructuring (eg, logical empiricism and disconfirmation), imaginal and in vivo exposure to feared stimuli while weaning from safety signals, and relapse prevention.

What are the Active and Salient Components of Psychological Interventions for Cognitive Behavioral Therapy?

A functional analysis usually initiates the treatment, establishing the topography of the problem behaviors, emotions, and cognitions, as well as their functional relationships with each other. The aim is to identify the factors that may cause, contribute to, or exacerbate a particular problem. This analysis includes a consideration of the antecedents and consequences of behavior, the stimuli that are eliciting cognitive, emotional, and behavioral conditional responses, and the cognitions that are contributing to the emotions and behaviors. The effect of environmental and cultural contexts on these relationships is evaluated as well. The functional analysis then guides the treatment approach.

Self-monitoring emphasizes the importance of a personal scientist model of learning to observe one's own reactions. Clients are trained to use objective terms and anchors rather than affective-laden terms. For example, clients who have panic disorder are trained to record the intensity of their symptoms on scales of 0 to 10 points instead of using a general description of how "bad" the panic attack felt. The objectivity of recording is assumed to enhance its effectiveness. Then, clients are taught what, when, where, and how to record symptoms. Various types of recording exist, but the most common include event recording (ie, whether an event occurs during a period of recording; that is, did a panic attack occur during a period 2 weeks before treatment) and frequency recording (ie, recording every event during the period of recording, for example every panic attack during the day). There rarely are contraindications to self-monitoring, although the method of monitoring often is modified to suit particular needs and to offset potential pitfalls. For example, the person who has obsessive-compulsive tendencies may benefit from limit setting or tightly abbreviated forms of self-monitoring. Occasionally, anxiety can worsen when it is monitored, although continued monitoring is encouraged to habituate the response.

The goal of psychoeducation is to provide basic information about fear and anxiety, to correct misconceptions about fear and anxiety, and to provide a treatment rationale. Psychoeducation aims to develop an objective and "normalcy-based" understanding to replace anxiety-producing conceptualizations (eg, "I am weird"). Psychoeducation is particularly helpful when clients have specific misappraisals of anxiety symptoms, as often is the case in panic disorder (eg, a racing heart during a panic attack is presumed to lead to a heart attack), posttraumatic stress disorder (PTSD) (eg, flashbacks are viewed as evidence of going crazy), and obsessive-compulsive disorder (OCD) (eg, thoughts about causing harm to others are seen as indicative of risk for actual harm). Psychoeducation is contraindicated when it becomes a safety signal (eg, when a patient carries bibliotherapy at all times to ward off anxiety). As with self-monitoring, psychoeducation sometimes can increase

anxiety, although continued exposure to the informational material (albeit perhaps at a slower pace) generally is recommended.

Somatic techniques include progressive muscle relaxation, in its condensed form of 8 to 15 sessions as standardized by Bernstein and Borkovec[4] rather than the lengthy training (30–50 sessions) originally developed by Jacobson.[5] Progressive muscle relaxation training involves tensing and relaxing major muscle groups in progression, followed by deepening relaxation through slow breathing and/or imagery. In systematic desensitization, relaxation is used to counter and inhibit anxiety induced by images of anxiety-provoking scenes.[6] In applied relaxation, relaxation is used as a coping tool when facing anxiety-producing situations. Occasionally, negative reactions can be produced by relaxation, such as relaxation-induced anxiety,[7] which involves intrusive thoughts, fears of losing control, and the experience of unusual and therefore anxiety-producing bodily sensations (such as depersonalization). These negative reactions need not be a contraindication to continued relaxation: discussion of the processes and continued exposure to relaxation and its associated states can be an effective tool for managing relaxation-induced anxiety. Another somatic technique is breathing retraining, which involves slow and diaphragmatic breathing exercises combined with a meditative focus of attention on the sensations of breath and/or words to accompany breathing (eg, counting). Typically, breathing retraining is used as a coping tool as anxiety-producing situations are approached (eg, Barlow and colleagues[8]). Breathing retraining and applied relaxation are discouraged when they may become a means of avoiding feared bodily sensations or a safety signal, as may occur in panic disorder (eg, Barlow & Craske[9]).

Cognitive restructuring begins with a discussion of how cognitive errors contribute to the misconstrual of situations and how they in turn lead to behavioral choices that compound distress and confirm misappraisals, contributing to a self-perpetuating cycle. Next, thoughts are recognized as being hypotheses rather than facts and therefore open to questioning and challenge. This approach is the cognitive technique of "distancing" or the ability to view one's thoughts more objectively and to draw a distinction between "I believe" and "I know." Once relevant anxiety-related cognitions are identified, they are categorized into types of errors, including dichotomous thinking, arbitrary inference, overgeneralization, and magnification, among others. The process of categorization or labeling of thoughts is consistent with a personal scientist model and facilitates an objective perspective by which the validity of the thoughts can be evaluated.

CBT therapists use Socratic questioning to help clients make guided discoveries and question their thoughts. Logical empiricism is employed by which rational consideration is given to the evidence that exists, including ignored evidence, historical data, and alternative explanations for events. As an example, persons who fear dying as a result of panic attacks might be asked to think about the number of times they have panicked and what the result has been in each case. Based on the logical empiricism and data from behavioral experimentation, alternative hypotheses are generated that are more evidence based. For example, the person who misappraises panic attacks as being physically dangerous may generate an alternative appraisal that panic attacks represent a definite change in physiology but one that is not harmful. Or, the person who misappraises a frown as a sign of being ridiculed may generate a variety of alternative appraisals for a frown such as habit, fatigue, misunderstanding, concerns external to the conversation, disagreement, and so on. In addition to surface-level appraisals (eg, "that person is frowning at me because I look foolish"), core level beliefs or schemas (eg, "I am not strong enough to withstand further distress" or "I am unlikable") are challenged and ultimately are replaced with less

dysfunctional schemas. Cognitive strategies can extend to meta-cognitions, or beliefs about beliefs, as is characteristic of generalized anxiety disorder (GAD) (eg, the belief that worry represents being out of control) or OCD (eg, the belief that obsessions represent craziness).

Cognitive strategies typically are included with other elements of CBT for panic disorder/agoraphobia, PTSD, social anxiety disorder, and GAD. Cognitive strategies generally are considered less central to the treatment for specific phobia and OCD. As noted later, however, the degree to which the addition of cognitive strategies benefits outcomes from behavioral components of CBT is questionable. In addition, issues of cultural sensitivity arise with cognitive restructuring. Cognitive strategies are closely aligned with the European/North American value of rational thinking. As noted by Hays and Imawasa,[10] emphasis on cognition, logic, verbal skills, and rational thinking can undercut the value many cultures place on spirituality. Related is the emphasis of cognitive strategies on reductionist cause-and-effect relations. In contrast, certain Asian cultural beliefs, for example, emphasize balance (or yin and yang), evaluation of systems holistically, and indirect causes for events. For cognitive strategies to be culturally sensitive, therapists must become knowledgeable about clients' cultural values and beliefs; this understanding could be informed through functional analyses.

Exposure is central to CBT for all anxiety disorders. Exposure therapy involves systematic and repeated approach to feared stimuli, both external, such as agoraphobic situations, and internal, such as feared bodily sensations associated with panic attacks, memories of trauma, or obsessions. Exposure can be conducted in imagination, which is most appropriate for stimuli that are difficult to practice confronting in real life (such as air travel) or are inherently imaginal (such as obsessions in OCD or memories of trauma in PTSD). Another modality gaining popularity is virtual reality; a strength of this modality is the control it provides over the parameters of exposure. For example, in the treatment of the fear of public speaking, virtual reality can provide systematic exposure to audiences of different sizes, to different responses from audiences, and so on. Writing exposure is sometimes used for exposure to traumas in the treatment of PTSD. In vivo (real-life) exposure is used commonly for most anxiety disorders. For example, individuals who have social anxiety are exposed to social situations, whereas individuals who have agoraphobia are exposed to situations such as driving or being away from home. Interoceptive exposure involves repeated and systematic exposure to feared bodily sensations, most applicable to panic disorder (eg, repeated hyperventilation to overcome fears of sensations of shortness of breath and paresthesias). Different modalities of exposure often are combined. For example, writing exposure or imaginal exposure to memories of a trauma can be combined with in vivo exposure to situational reminders of the trauma. Similarly, imaginal exposure to obsessions usually is accompanied by in vivo exposure to obsessional triggers, and virtual reality exposure to phobic situations usually is accompanied by instructions to practice exposure in real-life situations as well.

In models of classical conditioning, the aim of exposure is extinction, whereas in cognitive appraisal models the aim is to gather data to disconfirm distorted thinking. Exposure therapy does not teach skills and therefore is not appropriate when anxiety is related directly to skill deficits, as sometimes occurs in social anxiety or phobias of situations that require skills (eg, phobia of swimming for someone who has not learned how to swim). In the case of skills deficit, exposure therapy may be complemented with behavioral rehearsal strategies. Because exposure typically evokes high levels of anxiety at some point, it generally is not recommended when there are complicating

medical conditions that make high levels of autonomic arousal potentially harmful (eg, certain arrhythmias or severe asthma), but systematic desensitization may be considered under these conditions. Because of the potential for high levels of anxiety, attrition is a concern, especially if attrition occurs after initial exposure and before the benefits of exposure have taken place. Thus, careful attention is given to the rationale for exposure and readiness for exposure. Another contraindication is when exposure involves situations that actually are harmful (eg, when exposure places the individual at risk of exposure to an abuser).

Figs. 1 and 2 depict ways in which components of CBT are applied to the treatment of panic disorder and GAD. Panic disorder is believed to be maintained by a fear of bodily sensations that signal the possibility of panic, mediated by interoceptive conditioning and/or catastrophic misappraisals of the bodily sensations, as well as by avoidance behaviors that prevent new learning and sustain panic and anxiety over time (see Craske & Barlow, 2007). CBT involves psychoeducation and cognitive therapy for the misappraisals, exposure to feared bodily sensations and avoided situations, and sometimes breathing retraining as a coping tool for dealing with panic. Generalized anxiety disorder is believed to be maintained by cognitive (attention and judgment) biases toward threat-relevant stimuli and the use of worry (and associated tension) and overly cautious behaviors as a means to avoid catastrophic images (and associated autonomic arousal) (see Craske & Barlow[11]). CBT involves cognitive therapy to address worry and cognitive biases and relaxation to address tension, as well as imaginal exposure to catastrophic images and exposure to stressful situations while response preventing overly cautious behaviors.

Newer therapies for anxiety disorders include mindfulness and acceptance-based therapies such as acceptance and commitment therapy (ACT).[12] These therapies propose different approaches for dealing with anxiety-related cognition, including cognitive defusion (eg, distancing from the content of fear-based thinking) and mindfulness and acceptance,[13] and are more contextually based. To distinguish between traditional CBT approaches that use cognitive restructuring and aim to change the content of anxious thinking versus newer mindfulness and acceptance-based approaches that do not use cognitive restructuring or aim to change the content of anxious thinking, the former are referred to in this article as "CBT" and the latter as "mindfulness and acceptance-based approaches" or "third-wave" behavioral therapies.[14]
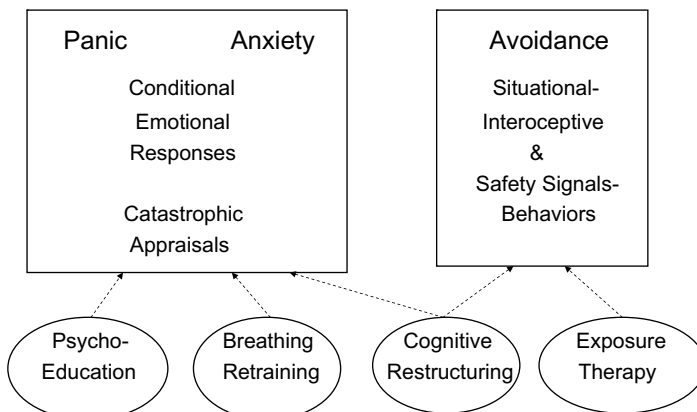

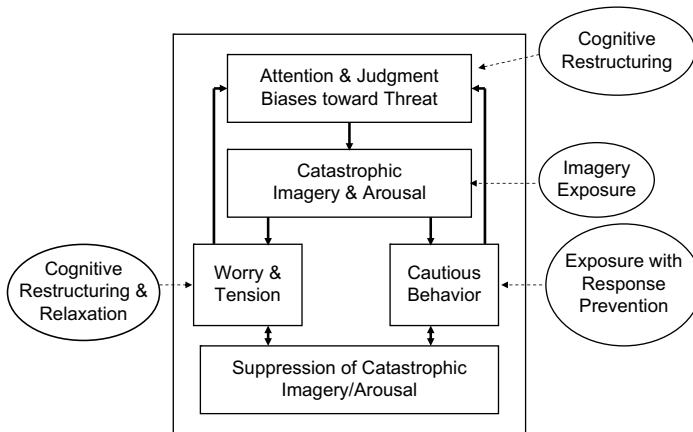Fig. 1. Panic disorder: maintainers and CBT targets.

Fig. 2. Generalized anxiety disorder: maintainers and CBT targets.

THE SCIENCE OF EXPOSURE THERAPY

Exposure therapy, a set of procedures involving repeated exposure to feared stimuli, is central to CBT for anxiety disorders. Although originally derived from learning theory, the mechanics of exposure therapy have failed to keep up with advances in the basic science of fear learning and extinction.[15] Instead, contemporary models of exposure therapy have been guided largely by "emotional processing" theory (EPT),[16,17] which emphasizes mechanisms of habituation. EPT purports that the effects of exposure therapy derive from activation of a 'fear structure' and integration of information that is incompatible with it, resulting in the development of a non-fear structure that replaces[16] or competes with[9] the original one. Incompatible information derives first from within-session habituation (WSH), or reduction in fear responding with prolonged exposure to the fear stimulus. WSH is considered a prerequisite for the second piece of incompatible information, which derives from between-session habituation (BSH) over repeated occasions of exposure. BSH is purported to form the basis for long-term learning and to be mediated by changes in "meaning" or lowered probability of harm (ie, risk) and lessened negativity (ie, valence) of the stimulus.

EPT guides clinicians to focus on the initial elevation of fear followed by within- and between-session reductions in fear as signs of treatment success. Although enticing in its face validity, support for the EPT theory has been inconsistent at best.[15] Rather, the evidence suggests that the amount by which fear habituates from the beginning to the end of an exposure practice (WSH) is not a good predictor of overall outcomes, and that evidence for BSH is very mixed.[15]

Thus, the authors have recommended a return to the science of fear learning and extinction to explain the effects of exposure therapy and thereby optimize its implementation.[15] Recent advances indicate that inhibitory learning is central to extinction.[18,19] Within a Pavlovian conditioning approach, inhibitory learning means that the original conditioned stimulus-unconditioned stimulus (CS-US) association learned during fear conditioning is not erased during extinction but rather is left intact as a new, secondary learning about the CS-US develops.[20] By implication, the original association between a conditional stimulus and aversive event is not erased through exposure therapy, but rather a new inhibitory association is developed. Basic research by Bouton[20] indicates that context plays a very important role in determining which set of associations is evoked. If the previously feared stimulus is encountered in a context that is similar to

the context in exposure therapy, then the inhibitory association is more likely to be activated, resulting in minimal fear. If the previously feared stimulus is encountered in a context distinctly different from the context of the exposure therapy, however, then the original excitatory association is more likely to be activated, resulting in more fear. Thus, a change in context is assumed to account, at least partially, for the return of fear that sometimes occurs following exposure therapy.[21] Being exposed to a new negative experience that leads to reinstatement or reacquisition of fear[22] also can lead to a return of fear.

Recognition of the role of inhibitory learning in extinction raises interesting questions about how to enhance exposure therapy. Some innovative strategies are being tested that, in contrast to EPT, do not center on the level of expressed fear and its reduction during exposure.[15] For example, inhibitory associations are formed from mismatches between the expectancy of an aversive event and its absence.[23] Such mismatches are assumed to be enhanced by the use of multiple excitatory conditioned stimuli during extinction training.[24,25] This process is called "deepened extinction" and is believed to result in superior learning because of the potency of the mismatch with expectancies provided by the presence of more than one conditional stimulus relative to a single conditional stimulus alone. There have been no direct investigations of this topic in clinical samples to date. The concept of deepened extinction is easily translated into exposure therapy, however, and indeed is the method used in the treatment for panic disorder and agoraphobia when interoceptive exposure to feared physiological sensations (eg, elevated heart rate) and in vivo exposure to feared situations (eg, walking through a shopping mall) subsequently are combined (eg, drinking caffeinated substances while walking through a shopping mall).[26] Given the important clinical implications, direct investigation of deepened extinction in clinical samples is needed.

Another interesting development is the use of biological agents to facilitate the consolidation of inhibitory learning during extinction. Fear extinction is dependent on N-methyl-D-aspartic acid (NMDA)-type glutamate receptors (NMDAr) (reviewed in[23]). NMDAr inhibitors block extinction when given systemically or infused directly into the amygdala during extinction training.[27] Furthermore, systemic or intra-amygdala treatments with D-cycloserine (DCS), an agonist at the glycine binding site of the NMDAr, facilitate extinction in rodents, although not completely.[28,29] The results of investigations combining D-cycloserine with exposure therapy for phobias remain somewhat mixed, with several reports of enhancement of exposure therapy and one report of no effects.[30–32] Nonetheless, further evaluation of this intriguing notion that learning throughout exposure therapy can be enhanced by biological agents is warranted.

The majority of neurobiological research on fear learning and extinction has focused on three general structures: the amygdala, the prefrontal cortex (PFC), and the hippocampus (see[33]). The PFC has long been implicated in executive control and decision making (see[34]). Recent work has revealed that certain parts of the PFC (ie, the ventral medial) also are responsible for emotional regulation and, in particular, for the ability to interpret emotional stimuli and change behavior accordingly (see[33]). Given this role, the ventral medial PFC potentially serves as a prime candidate for a fear extinction structure. In support, extinction in non-primates is associated with neuronal activity primarily within the medial PFC.[35] Research with humans similarly shows that changes in the medial PFC occur during extinction.[36] It has been suggested that the PFC exerts inhibitory control over the amygdala at extinction re-test (see[33]). Hence, behavioral methods for enhancing PFC throughout exposure therapy may prove to be a useful direction for future research. Conceivably, when cognitive restructuring does enhance the benefits of exposure therapy alone, it may do so by activating the PFC. Research on optimal ways of activating the PFC through cognitive-verbal means is warranted.

In addition, the effects of exposure therapy are enhanced by the prevention or removal of "safety signals" or "safety behaviors." Common safety signals and behaviors for clients who have anxiety disorder are the presence of another person, therapists, medications, or food or drink.[37] In the experimental literature, safety signals alleviate distress in the short term, but when they are no longer present, the fear returns,[38] an effect that may derive in part from interference with the development of inhibitory associations. In phobic samples, the availability and use of safety signals and behaviors has been shown to be detrimental to exposure therapy,[39] whereas instructions to refrain from using safety behaviors improved outcomes.[40]

Finally, attention has been given recently to ways of enhancing the retrieval of new inhibitory associations once exposure therapy is completed. One possibility is to conduct exposure therapy in as many contexts as possible (eg,[41]). Another is to provide retrieval cues that remind clients, when they are outside the therapy context, of the new learning that took place in the therapy context[42] or at least to recommend to clients that they actively try to remember what they learned when in the therapy context;[43] both approaches have been shown to offset renewal effects.

EMPIRICAL EFFICACY

Meta-analyses of CBT for anxiety disorders provide a snapshot of efficacy findings across a large number of treatment studies. Meta-analyses use effect-size statistics to capture the magnitude of the differences between disparate types of treatment (or treatment and controls); frequently, treatment differences are measured with Cohen's d effect size (ES) statistics. A Cohen's d effect size of 0.80 or higher is considered a large effect size or difference between groups, 0.50 represents a medium or moderate effect size, and 0.20 represents a small effect size.[44] In translating a moderate effect size to the percentage of clients showing improvement, Heimberg and colleagues[45] demonstrated clinically significant improvement in two thirds of socially anxious patients in a CBT group, versus one third of patients in the active control group.

A review of meta-analyses of randomized, controlled trials by Butler and colleagues[46] demonstrated large effect sizes for CBT in treating a range of anxiety disorders, including panic disorder with or without agoraphobia, GAD, social phobia, and PTSD. Compared with no treatment, wait-list, or placebo controls, the comparison-weighted grand mean effect size of CBT across these anxiety disorders and unipolar depression in adults and children was 0.95 (SD = 0.08) from pre- to posttreatment.[46] These effects are consistent with a second, more recent meta-analysis of CBT for all of the anxiety disorders (with the exception of specific phobia);[47] CBT was more effective than no treatment or "expectancy control" (pill placebo, attentional placebo, nonspecific therapy) conditions across all anxiety disorders. For panic disorder, a meta-analysis by Gould and colleagues[48] found that CBT yielded an effect size of 0.68, particularly when it included interoceptive exposure (effect size = 0.88), that was higher than the effect size for pharmacotherapy (0.47) or combined CBT and pharmacotherapy (0.56). More impressively, CBT showed no slippage of gains at follow-up (usually at 6 months posttreatment, effect size = 0.06), compared with pharmacotherapy (effect size = −0.46) and demonstrated lower attrition rates (6% in CBT versus 20% in pharmacotherapy and 22% in combined treatment). For the treatment of GAD, a carefully conducted meta-analysis by Mitte[49] found that CBT was superior to no treatment (effect size = 0.82) and to medication and therapy placebo (effect size = 0.57), with persistence of effects through the 6-month follow-up.[50] Comparisons of CBT and pharmacotherapy for GAD depended

on methodology but found largely equivalent results; however, CBT had significantly lower dropout rates (9%) than pharmacotherapy (~25%), suggesting it was better tolerated.[49] For the treatment of OCD, CBT conferred significant benefits from pre- to posttreatment (effect size = 1.30 to 1.86), and benefits endured at 6-month and 1-year follow-up.[51] CBT for OCD was equivalent in effectiveness to exposure and response prevention, a behavioral therapy often considered the treatment of choice.[52] Replicating the results of a previous meta-analysis,[53] a meta-analysis by Gould and colleagues[54] for social anxiety disorder showed equivalent pre- to posttreatment effects for CBT (effect size = 0.74) and pharmacotherapy (effect size = 0.62). A larger meta-analysis on social anxiety disorder[55] found similar effect sizes for exposure therapy (1.08–3.47) and exposure plus cognitive therapy (0.84–1.80), relative to attention control (1.08–1.24) and pill placebo (0.66–0.81) and showed that the effects of exposure or exposure plus cognitive restructuring were maintained from pretreatment to 6-month follow-up (effect sizes = 1.31 and 0.95, respectively).

For PTSD, a large meta-analysis of CBT and behavioral therapies[56] found that by posttreatment follow-up, 67% of patients who completed treatment no longer met criteria for PTSD, whereas 56% of patients who entered treatment (ie, including drop-outs) no longer met criteria for PTSD. CBT and behavioral therapy were far more effective than wait-list control (effect size of comparison = 1.11–1.53) or supportive therapy (effect size of comparison = 0.83–1.01) (This meta-analysis included eye movement desensitization and reprocessing [EMDR] and did not find significant differences in pre- and posttreatment effect size among traditional CBT, behavioral therapy (exposure), and EMDR.)

Excellent CBT outcomes also have been demonstrated for specific phobias.[2] Even in samples of older adults (age > 60 years), for whom CBT yields somewhat less impressive results, a recent meta-analysis indicated that CBT was more effective than wait-list (standard mean effect size difference = −0.44, 95% confidence interval [CI] = −0.84 to −0.04) and active control conditions (Active control treatments were defined as treatment as usual or as "any other strategies that provided a contact frequency comparable with … CBT" (p. 405)) (standard mean effect size difference = −0.51, 95 CI = −0.81 to −0.21).[57] Efficacy extends to efforts at prevention of full-fledged anxiety disorders in youths presenting with subclinical and clinical anxiety symptoms.[58,59]

Notwithstanding its demonstrated efficacy across the anxiety disorders, CBT presents challenges on several fronts, most notably in dropout rates and treatment refusal, limited comparisons with other active treatments, and long-term follow-up.

DROPOUT RATES AND TREATMENT REFUSAL

Estimating the number of treatment-seeking patients who refuse to begin CBT is difficult; few studies describe the relevant data. One study, conducted at an anxiety disorders outpatient clinic in a university hospital, reported that nearly one third of a large patient sample referred by general medical practitioners or mental health specialists did not begin CBT.[60] In this sample, pretreatment attrition was related to higher levels of depression, referral by a general practitioner rather than by a mental health specialist, and assignment to group therapy rather than to individual therapy. CBT entry rates may be improved by providing preparatory videos or pamphlets that depict CBT methods, a particularly valuable approach for minority groups.[61]

More studies have reported rates of attrition from ongoing CBT, particularly for panic disorder and social anxiety disorder. The average reported CBT attrition rate in panic disorder treatment is 17% of patients (range, 0–54% attrition), and for GAD the CBT attrition rate is 7% (range, 0–17%),[62] although these rates were derived

largely from small trials with fewer than 30 patients. A large, randomized, clinical trial (> 150 patients) comparing CBT versus imipramine for panic disorder reported an attrition rate for CBT alone (defined as non-completion of 11 assigned CBT sessions) of 27%.[63] In the treatment of social anxiety disorder, one study also reported a one-third attrition rate and found that higher baseline levels and expressions of anger were associated with attrition.[64] However, most studies fail to find differences between completers and non-completers in terms of sociodemographics or symptom patterns. Limited power to detect differences likely hinders such comparisons. At least for GAD and panic disorder, the addition of pharmacotherapy to CBT results in higher dropout rates than seen with CBT alone.[46,49,65]

LONG-TERM FOLLOW-UP

CBT results often are maintained over follow-up intervals that extend from 6 to 24 months.[46,47,62] For example, in the review of meta-analyses mentioned earlier, Butler and colleagues[46] reported evidence for the maintenance of treatment gains in GAD, panic disorder, social phobia, and OCD. The long-term effects were particularly impressive for panic disorder: the 1-year follow-up rate of relapse was nearly half that of pharmacotherapy. On the other hand, in a university clinic–based study of patients who had panic disorder, 27% of patients who were panic-free by the end of CBT obtained additional treatment for panic disorder over the 2-year follow-up period.[66] Furthermore, long-term CBT effects tend to diminish in non-university, community-based treatment settings.

Few CBT studies examine follow-up beyond a 2-year period. One of the few such studies contacted patients from largely primary care and community-based randomized, controlled trials of brief CBT for panic disorder, GAD, or PTSD. Two to 14 years after treatment, 34% of patients treated for GAD, 26% of patients treated for panic disorder, and 55% of patients treated for PTSD met criteria for the treated disorder.[67] In addition, 52% of the GAD, 48% of the panic disorder, and 74% of the PTSD patients met the *Diagnostic and Statistical Manual of Mental Disorders-IV* criteria for co-occurring psychiatric disorders, and nearly two thirds sought additional treatment for anxiety during the follow-up interval. Interestingly, this study found no relationship between more intensive therapy and long-term outcomes, although more complex/severe baseline symptoms predicted poorer long-term outcomes. An earlier study[68] focused on long-term (8–14 years) outcomes from two university-based CBT trials for GAD. The patients in the first trial were healthier (eg, had less chronicity, severity, and complexity of illness and greater social resources) than patients in the second trial; at long-term follow-up, 70% of the patients in the first trial did not meet criteria for any psychiatric disorders, 33% to 48% met criteria for full recovery from GAD, and only 3% sought additional treatment during follow-up. In the second trial, only 37% of the patients did not meet criteria for any disorders, 22% to 39% met criteria for full recovery from GAD, and 23% sought additional treatment during follow-up. Treatment with CBT resulted in lower overall psychiatric symptoms and utilization of additional treatment than the combined non-CBT conditions, although there were no differences in diagnostic status (Non-CBT conditions included medication or placebo in Trial 1 and analytic therapy in Trial 2; however, comparisons with individual non-CBT conditions were not made.) The disparate results of the two trials point to possible predictors of long-term CBT outcomes for GAD that are worthy of further study. More targeted research on extended long-term outcomes for anxiety disorders and the factors related to them, especially in real-world settings (eg, therapist characteristics; patient characteristics; socio-economic context; therapeutic alliance;

treatment setting, duration, and adherence; and complexity of treated disorders) is greatly needed.

CO-OCCURRING DISORDERS

Whether CBT for a targeted anxiety disorder diminishes co-occurring disorders remains an important question. Anxiety disorders have high rates of co-occurrence with other Axis I disorders, particularly other anxiety disorders but also major depressive episode, dysthymia, substance abuse, and somatoform disorders (especially hypochondriasis and somatization disorder).[69,70] Several studies have shown that overall rates of co-occurring disorders decrease immediately following CBT for panic disorder[71–74] and GAD.[75] On the other hand, a rigorous analysis of CBT for panic disorder found that, with the exception of GAD, rates of co-occurring disorders decreased immediately following CBT but had increased to approximately pretreatment rates by 2-year follow-up.[66] Although the reasons for this resurgence are not fully known, it may reflect underlying risk factors, such as high levels of neuroticism and poor emotional regulation skills, that cause vulnerability to a variety of mood and anxiety disorders throughout the life span.[76] Methodologies for improving long-term maintenance of treatment gains for primary and/or co-occurring disorders might include following the acute phase of CBT with telephone-delivered or Internet-based booster sessions, which have been found in at least one study to contribute to long-term outcomes.[77] Simultaneous application of CBT for panic disorder and CBT for co-occurring disorders was not found to benefit outcomes over CBT for panic disorder alone, however.[72]

LIMITED TREATMENT COMPARISONS

Although a number of researchers integrate alternative therapeutic approaches, such as interpersonal or acceptance-based approaches, with more traditional CBT or behavioral approaches,[78,79] few directly compare CBT with another treatment approach. In general, the extant randomized control trial literature compares CBT for anxiety disorders with a limited set of alternative treatments such as wait-list control, pill placebo, attention-control placebo, non-directive supportive therapy, or psychoeducation. Except for comparisons with behavior therapy (as discussed later), the meager comparisons of CBT for anxiety disorders with other active, full-treatment conditions such as interpersonal, psychodynamic, or integrative approaches, limits the understanding of the unique or incremental benefits of CBT relative to other active treatments for anxiety disorders.

COMPONENT ANALYSES OF COGNITIVE BEHAVIORAL THERAPY

Longmore and Worrell[80] reviewed the evidence regarding the relative contributions of cognitive and behavioral strategies to treatment outcomes. They concluded that there was no strong evidence that cognitive approaches produced better results than behavioral approaches (ie, behavioral activation and exposure therapy) alone or that cognitive approaches added to the benefit of behavioral approaches. Similarly, a meta-analysis by Norton and Price[47] found no differences across cognitive therapy, exposure therapy, relaxation, or their combination for anxiety disorders. Even self-reported cognitive appraisals and beliefs are changed to the same degree by cognitive and behavioral methods of intervention (eg,[53,81]). Thus, despite occasional demonstrations of superior outcomes from cognitive-based treatments over behavioral treatment alone, as in the case of a recent trial for social phobia,[82] the findings of no

differences are broad and compelling and have led several researchers to conclude that the cognitive restructuring component of CBT is superfluous and not necessary (eg,[83]). Another interpretation is that outcomes from mostly cognitive, behavioral, and somatically oriented CBT interventions do not differ because the interventions share much in common. For example, the discussion of intrusive thoughts in cognitive therapy overlaps with exposure therapy, and exposure to feared situations usually involves discussion of appraisals.[1] Nonetheless, if cognitive and cognitive behavioral therapies stipulate that maladaptive thoughts must be challenged, and behavioral therapy obtains roughly equivalent results without doing so, another pathway may be at work. Weighing the evidence for a cognitive pathway to therapeutic change leads directly to a discussion of treatment mediators.

MEDIATORS OF COGNITIVE BEHAVIORAL THERAPY

The cognitive appraisal model of CBT assumes that the active therapeutic mechanism is a change in dysfunctional assumptions and core beliefs toward a more rational and evidence-based orientation. Mediation can be ascribed only when change in cognition is shown to occur before, and becomes a significant predictor of, change in symptom outcomes; very few studies have met these criteria.

Of the available adequate or close-to-adequate studies, the evidence for cognitive mediation of CBT is mixed. Hofmann[84] found that pre- to posttreatment changes in the cognitive variable of estimated social cost, or the projected catastrophic consequences of inept social behavior, mediated reductions in social anxiety at posttreatment and 6 months later in socially anxious individuals treated with CBT. In addition, Kendall and Treadwell[85] found that changes in anxious self-statements mediated treatment gains in children who had anxiety disorders undergoing CBT. On the other hand, Burns and Spangler[86] found no evidence of a mediational link between dysfunctional attitudes and changes in anxiety and depression among a sizable sample of CBT-treated outpatients ($n = 521$). Similarly, a review of the CBT literature by Longmore and Worrell[80] found limited empirical evidence for cognitive mediation of therapeutic change in CBT; in other words, there was limited evidence that change in automatic thoughts, beliefs, or attributions caused symptom improvements. The lack of robust evidence for cognitive mediation of CBT outcomes may stem partly from the inherent limitations of self-report measurement of cognitive change, given the likely demand characteristics and the questionable degree to which self-report data match ongoing, moment-to-moment thinking.[87] Beyond issues of measurement, however, limitations of the cognitive appraisal model are being recognized increasingly. For example, given that the majority of information processing occurs at subconscious levels, without conscious appraisal, the adequacy of attempts to change conscious appraisals has been questioned (eg,[88]). Obviously, attempts to change conscious appraisals form the heart of CBT's cognitive component. Alternative methods for shifting styles of information processing that do not depend on conscious reappraisals now are being tested as complements to or replacements for CBT. These alternatives include mindfulness and acceptance-based approaches, which have been coined the "third wave" of behavioral therapies.[89]

ACCEPTANCE AND MINDFULNESS-BASED APPROACHES TO TREATMENT

Stemming from growing evidence that cognitive strategies are unnecessary in CBT and from a desire to broaden the focus of change and to adopt contextualistic assumptions about the causes of behavior and function of cognition, clinical researchers have developed a new group of treatments, third-wave behavioral

therapies. Third-wave therapies integrate mindfulness and acceptance and provide alternatives to the first-order cognitive change strategies (eg, cognitive restructuring) in CBT. ACT, a third-wave behavioral therapy that has been applied to treat anxiety disorders, uses mindfulness and acceptance-based processes such as cognitive defusion, contact with the present moment, and self as context to shift the patient's relationship to cognition, decrease suppression and avoidance of internal experience (known as "experiential avoidance"), increase psychological flexibility, and, ultimately, promote behavior change in the direction of client's chosen values.[83] ACT derives from a basic theory of human cognition and language known as "Relational Frame Theory"[90] and comprises a general set of treatment strategies for application across the full range of psychopathology, including specialized treatment manuals for anxiety disorders.[13] ACT also stems from behavior analysis, which defines behavior as anything one is doing and argues that behavior can understood only be by analyzing the full context in which it occurs. By implication, all psychological symptoms, both internal and external, are relevant targets for treatment in ACT. The context or function of cognition—that patients understand their thoughts to be true and limit valued behaviors accordingly—is emphasized over the content of cognition. Rather than attempt to change the content of thinking directly, as in CBT, the context and function of cognition are modified in ACT, often by helping patients create distance from the literal content of thinking with cognitive defusion (eg, thought content distancing) skills and mindfulness. Mindfulness has been defined as "an open or receptive awareness to what is taking place in the present moment."[91] The related construct of acceptance refers to the quality of "leaning into" and "embracing" rather than judging and suppressing present experience, particularly present internal experience. Acceptance within mindfulness-based treatments is distinguished from acceptance within psychodynamic traditions, which often involves a complex, drawn-out process of acknowledging, analyzing, grieving, and eventually accepting the painful realities and losses in one's past and present to move on to a better future (see[92]). In a mindfulness context, the past is not analyzed, but rather its expressions in the present moment are compassionately acknowledged and accepted.

No randomized trials on ACT for diagnosed anxiety disorders have been published to date, but several published case studies and nonrandomized, baseline control studies outline successful applications of ACT to a variety of anxiety disorders, including social anxiety disorder, OCD, GAD, and PTSD (eg,[93–95]). Although specific anxiety disorders were not diagnosed, another study randomly assigned 101 anxious and depressed patients at a university clinic to ACT or cognitive therapy. Improvements in anxiety, depression, quality of life, and clinician-rated functioning were equivalent across the two treatments.[96] There was some indication that the treatments operated by different pathways, namely, that changes in self-reported avoidance of internal experience, acceptance, and mindful action correlated more with self-reported outcomes in ACT, whereas changes in self-reported observing and describing one's experiences were correlated more with self-reported outcomes in cognitive therapy. Although intriguing, these results should be interpreted cautiously because the temporal precedence for mediation was not established, measures were restricted to self-report scales, and several differences between treatment pathways did not reach full statistical significance.

The degree of difference between ACT and CBT remains a point of debate, however.[97] For example, a recent theoretical analysis[98] concluded that the pathways for ACT and CBT treatment of anxiety disorders may differ, but the overall treatment processes and outcomes seem more similar than distinct. Research using randomized, controlled design is needed to assess ACT for anxiety disorders more carefully,

to compare ACT with cognitive therapy and traditional CBT, and to replicate the nascent results described earlier.

Other third-wave mindfulness and acceptance-based interventions have been developed specifically for the treatment of anxiety disorders. For example, Roemer and Orsillo[79] have argued that mindfulness and acceptance may be particularly appropriate for treating future-oriented anxiety, as is characteristic of GAD, that is difficult to dispute by logical argumentation. A pilot study ($n = 16$) of an acceptance-based therapy for GAD demonstrated significant improvements at posttreatment and 3-month follow-up across clinician-rated disorder severity ratings and relevant self-report measures.[99] In addition, others argue that a focus on emotion regulation, emotional avoidance, and/or interpersonal disturbances may prove particularly useful in treating a GAD population.[78,100] For example, Newman and colleagues[101] conducted an open pilot study ($n = 18$) of an integrative CBT therapy that addressed emotional avoidance and interpersonal issues and demonstrated significant improvements at posttreatment and 1-year follow-up.

Finally, interest in Kabat-Zinn's mindfulness-based stress reduction (MBSR),[102] a mindfulness-based intervention without behavioral components, continues to grow. Taught in a group format, MBSR teaches patients multiple mindfulness practices: daily informal mindfulness practices (mindfulness of eating, driving, washing dishes, and other activities), formal sitting meditation (mindfulness of breath), basic Hatha yoga (mindfulness of movement), and a body scan meditation (mindfulness of body). The only randomized, controlled trial to date compared MBSR with CBT group therapy for social anxiety disorder.[103] Results show that both treatments led to significant symptom and mood improvements; however, patients treated with CBT showed significantly higher response and remittance rates and lower scores on clinician- and patient-rated measures of social anxiety. MBSR groups were nearly twice as large as CBT groups, were not led by a mental health professional, and did not include behavioral exposures, factors that may have reduced benefits to this group.

Based on MBSR, Segal and colleagues[104] developed a related treatment known as mindfulness-based cognitive therapy (MBCT), which they successfully applied to reduce relapse/recurrence rates in previously (and frequently) depressed patients.[105,106] One uncontrolled pilot study ($n = 11$) recently applied MBCT to the treatment of GAD,[107] demonstrating significant pre- to posttreatment reductions in anxiety, worry, and depression symptoms. No randomized, controlled trials of MBCT for anxiety disorders have been published to date, however.

In summary, multiple acceptance and mindfulness-based interventions, including ACT, acceptance-based therapy for GAD, MBSR, and MBCT, show initial promise in the treatment of one or more anxiety disorders. Given the popularity of mindfulness and acceptance-based approaches and their growing application to anxiety disorders, additional large, randomized, well-designed studies are essential to expand the understanding of this emerging area.

UNIFIED TREATMENT PROTOCOLS

Another new approach in the treatment of anxiety disorders is the development of unified treatment protocols for use across all the anxiety disorders. Unified treatment protocols are treatment manuals or sets of treatment principles that treat core psychopathological processes common to a broad class of psychiatric disorders, such as anxiety disorders or emotional disorders (eg, anxiety and mood disorders). Barlow and colleagues[108] put forth two rationales to support their unified, CBT-focused treatment protocol for emotional disorders. First, significant co-occurrence among the

emotional disorders, mutual response to the same or similar treatments (eg, selective serotonin reuptake inhibitors, CBT) and the response of secondary disorders to treatment of primary disorders suggest common etiologies, risk factors, and treatment pathways among the emotional disorders. Second, the number of treatment manuals for specific emotional disorders has proliferated to such an extent that the dissemination and mastery of extant manuals has grown increasingly burdensome. Integrating decades of scientific evidence against this backdrop, Barlow and colleagues[108] propose three central components for treating emotional disorders: (1) modifying antecedent cognitive appraisals; (2) preventing emotional avoidance; and (3) facilitating opposing action tendencies when the dysregulated emotion arises (ie, encouraging dysregulated patients to behave the opposite way that they feel). The treatment involves standard emotional exposure and mood-induction exercises and tailors these exercises to the particulars of a given presentation. The efficacy of the unified treatment protocol for emotional disorders has not been tested rigorously, although the authors report that several small groups of heterogeneous patients treated with the unified protocol seemed to do as well as or better than disorder-specific treatment groups.[108]

Other researchers have employed unified, also known as "transdiagnostic," treatment protocols in the treatment of mixed anxiety disorder groups. For example, Norton[109] applied a transdiagnostic CBT group treatment within a mixed anxiety disorder sample ($n = 52$), mostly comprising patients who had panic disorder and social anxiety disorder. Patients improved significantly during treatment, demonstrating clinically significant decreases in state anxiety, and improvements did not differ by diagnostic group. Results should be interpreted cautiously, however, because the study was uncontrolled and used only a single outcome measure (eg, state anxiety). A larger study by Erikson and colleagues[110] randomly assigned diagnostically mixed patients who had anxiety disorders ($n = 152$) to a CBT group for (any) anxiety disorders or a wait-list control group. The transdiagnostic group that received CBT evidenced superior outcomes compared to the wait-list control group at posttreatment assessment and 6-month follow-up. In summary, although more research is needed, the preliminary evidence demonstrates initial efficacy for transdiagnostic CBT in mixed anxiety disorder groups, relative to baseline and wait-list control conditions.

As noted earlier, ACT provides a unified set of treatment principles and technologies to apply across diverse psychopathologies. Eifert and Forsyth[13] developed a unified treatment protocol that applies ACT to the treatment of all anxiety disorders. A series of case studies support its effectiveness;[95] randomized, controlled trials have yet to be published.

Potential advantages of unified or transdiagnostic treatment protocols include ease and flexibility of delivery, particularly within treatment groups of diagnostically diverse patients, and adeptness in treating complex, multi-issue patients. Unified protocols have not yet been fully tested against diagnostic-specific protocols, however, and may lack the degree of specificity needed to treat individual anxiety disorders as effectively. Ensuring that unified protocols are at least as effective as, if not more effective than, diagnostic-specific protocols will be an important step in assessing their utility. Nonetheless, the focus on common treatment factors invites researchers to consider shared underlying etiologies and mechanisms of change in the treatment of emotional disorders.

BROADER IMPLEMENTATION

A continuing challenge is the implementation of CBT in real-world settings, such as primary care settings where anxiety disorders are particularly prevalent,[111] costly,[112] and poorly treated,[113] with anxious patients often dissatisfied because of perceived

unmet needs.[114] Adapting CBT to these settings requires consideration of several factors, including the limited training in CBT available to therapists and health care providers, limited client motivation, and limited clinic resources.

One option is to provide expert CBT therapists in primary care and other real-world settings (eg,[73]) although this option is costly and unlikely to be sustained over time. Another option is to train local therapists, an approach that becomes especially viable with computerized technology as a way of offsetting training costs.[115] A third option is a computerized system approach the authors developed for supporting delivery of CBT for anxiety disorders by novice clinicians, called "CALM Tools for Living."[116] This CBT approach addresses the four most common anxiety disorders in primary care settings: panic disorder with or without agoraphobia, GAD, social anxiety disorder, and PTSD. In this program, the core elements of CBT are the same across the four anxiety disorders, but other elements are tailored to the features unique to each anxiety disorder through branching mechanisms. Preliminary results indicate that the computerized program is well liked by novice clinicians.[116] The computer program aids them by providing the structure for delivering CBT and helping clinicians remain on target and maintain CBT fidelity. The computer program is designed to help the clinician to guide the patient as opposed to a patient self-directed program.

Another dissemination strategy is self-directed treatment, mostly recently delivered by computer and Internet technology. These programs have been found to be generally acceptable to clients and effective in treating depression and anxiety (eg,[117]) as well as specific anxiety disorders, including panic disorder (eg,[118]) social anxiety disorder,[119] PTSD,[120] and OCD.[121] Solely computerized/Internet treatments are problematic, however, because they are associated with higher rates of dropout or refusal and lower rates of satisfaction with therapy, compared with a live clinician.[122] Computerized programs are more acceptable and more successful when clinician involvement is offered (eg,[123]).

Finally, preparatory techniques and motivational interviewing have the potential to increase attendance and participation in CBT sessions within real-world settings. For example, providing three sessions of motivational interviewing before CBT treatment of anxiety disorders has been shown to enhance treatment compliance and response among patients in a public hospital mental health clinic.[124]

SUMMARY AND FUTURE DIRECTIONS

This article has presented both the challenges and recent developments in CBT and alternative therapies. Numerous research developments are underway, including greater linkage of exposure therapy to basic science and learning theory, more rigorous testing of mindfulness and acceptance-based treatments, distilling CBT approaches into a single set of treatment principles, and bringing CBT fully into primary care and community settings. All represent exciting new directions and/or expansions of classic CBT for anxiety disorders. Several of these developments are founded on a return to basic scientific theory and research and, from this perspective, share common aims. The article has noted the paucity of research on anxiety disorders that directly attempts to prevent posttreatment relapse and/or the re-emergence of co-occurring disorders, an area of burgeoning success in major depression.[104–106] In addition, relatively little is known about the patient, therapist, treatment, or contextual factors associated with CBT refusal and attrition and few interventions aim to prevent these problems. Finally, to conclude on a note of promise, investigating the neural underpinnings of CBT-related improvements may aid in more precisely

understanding and targeting the central pathways of therapeutic change in future research on anxiety disorders.

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