`   Acceptance and commitment therapy as a treatment for anxiety and depression: A review

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Synopsis:

Acceptance and commitment therapy (ACT) is a modern form of cognitive behavioral therapy based on a distinct philosophy (functional contextualism) and basic science of cognition (relational frame theory). This article reviews the core features of ACT's theoretical model of psychopathology and treatment as well as its therapeutic approach. It then provides a systematic review of randomized controlled trials (RCTs) evaluating ACT for depression and anxiety disorders. Summarizing across a total of 36 RCTs, ACT appears to be more efficacious than waitlist conditions and treatment-as-usual, with largely equivalent effects relative to traditional cognitive behavioral therapy. Evidence from several trials also indicate that ACT treatment outcomes are mediated through increases in psychological flexibility, its theorized process of change.

Acceptance and commitment therapy (ACT)[1] is part of a larger research approach called Contextual Behavioral Sciences (CBS). Those with a CBS focus to their work generally adhere to a behavior-analytic theoretical orientation, and as such have a strong interest in the basic science that informs the techniques used in therapy. Behavior analysis traditionally focused on the use or contingency management procedures to modify overt actions, and did not have a conceptualization of the role of cognition other than it being another form of behavior that was reinforced by the verbal community.[2] This differs from CBS in that, the most active line of basic research is a behavioral account of language and cognition called relational frame theory (RFT).[3] RFT has been an active line of research since the 1970's when it was called stimulus equivalence.[4] Since that time, RFT research has expanded and provides a method to study language and cognition, and inform behavioral interventions. To put it simply, ACT as described in this paper, is modern behavior analysis applied to clinical issues including anxiety and depression. This manuscript will review the foundations of ACT, its theoretical model of psychopathology and treatment, and the empirical evidence for ACT as a treatment of anxiety and depressive disorders.

Foundations of ACT

Contextual Behavioral Science. CBS references a specific approach to science grounded in functional contextualism and behavior analysis. CBS focuses on the role of context in understanding and influencing human behavior, with a reticulated approach that integrates basic and applied scientific activities. A book length review of CBS exists.[5]

Functional Contextualism. Clarifying philosophical assumptions is critical for ensuring the coherence and effectiveness of a program of research[6], as well as understanding differences between therapeutic approaches.[7] ACT as a part of CBS adopts the core assumptions of

functional contextualism, which are generally consistent with common assumptions in behavior analysis.[8,9] Functional contextualism is a pragmatic world view in that it defines truth with regards to success in achieving stated goals, which in the case of *functional* contextualism are prediction and influence of behavior. From this perspective, scientific activities and analyses are "true" in so far as they help to *both* reliably predict (understand) behavior and guide how to influence (change) behavior. This diverges from some alternate philosophical stances in which correspondence between a model and the world as it actually is would define a "true" analysis.[8]

The unit of analysis in functional contextualism is the organism interacting in and with a context (defined currently and historically). This means that analysis of behavior must include consideration of context in which it occurs. Although this single unit of the "act in context" can be parsed out into components, this is done with awareness that these parts cannot be fully understood independently, but rather are distinguished in so far as it helps serve prediction and influence.

This emphasis on analyzing the "act in context" for the purpose of prediction and influence has notable implications for the scientific approach, theory, and even specific clinical methods used in ACT. In order to have an analysis directly inform how to influence behavior, it needs to include identification of variables that can be directly manipulated. This perspective provides the foundation for ACT's approach to private events such as cognition and emotion. Rather than seeking to target specific cognitions and emotions to alter their downstream effects on other behaviors (e.g., restructuring self-critical thoughts to decrease depressed mood and increase social activation), ACT seeks to alter the context in which these behaviors occur. This is sometimes referred to as a "decoupling" effect[10] in that ACT alters the context of relating to

internal experiences such that they have less influence on behavior (e.g., self-critical thoughts are noticed as just thoughts, while one chooses to engage in social activities).

Another example of the implications of functional contextualism for ACT is the strong emphasis on integrating basic science. This is why ACT is aligned specifically with behavior analysis and a behavioral account of cognition, which similarly emphasize the development of basic principles that support prediction and influence of behavior and consideration of manipulable context/behavior relations.

Relational Frame Theory. Over the past several decades, researchers have developed a behavioral model of language and cognition called RFT.[3,5] RFT focuses on the role of a specific type of behavior, arbitrarily applicable derived relational responding, as a central component of language and cognition.

Relational responding references the behavior of relating symbols and stimuli (e.g., "this *is similar* to that," "this is *bigger than* that," "*If* I do this, *then* that will happen"). However, humans also have the unique capacity to derive relations beyond direct learning history (e.g., learning a nickel is smaller than a dime and a dime is smaller than a quarter, and deriving a quarter is greater than a nickel). This ability to derive relations helps account for the generativity in language acquisition and the capacity to learn absent direct learning histories (e.g., in the case of obsessions, "if HIV is like a germ and you can catch germs from touching dirty things, then I shouldn't touch doorknobs or I'll get HIV"). Furthermore, derived relational responding can be applied arbitrarily, meaning social cues (instead of just physical properties of stimuli) can inform us of how to relationally respond to stimuli. Many studies have demonstrated humans ability to engage in arbitrarily applicable derived relational responding in a variety of contexts and forms of relations.[11] These features of relational behavior may account for aspects of cognitions such as

how relations can be made between any number of stimuli absent direct history or what could be inferred from physical properties (e.g., I drink too much, people who drink too much are addicts, addicts are bad people, I'm a bad person, bad people should be avoided, I should stay away from people I love).

This last example highlights another key property of relational behavior, which is that they can transform the functions of stimuli. For example, previously neutral stimuli (e.g., driving in a car) could be transformed into aversive stimuli to be avoided due to participation in relational frames, even when there is no direct learning history (e.g., I could lose control if I have a panic attack, what if I had a panic attack in a car while driving, I have to avoid driving or else I'll crash and die). Thus, how individuals relate experiences can alter the function of these experiences – in lay words, how we think about things alters what these things mean.

As these examples begin to highlight, the capacity to derive relations between stimuli arbitrarily and for these relations to alter the functions of these stimuli may account for a variety of psychological challenges. This can greatly expand the range of stimuli associated with aversive functions, which when combined with a propensity to avoid unwanted internal states, can lead to rigid, broad patterns of avoidance. Laboratory-based research has modeled this, demonstrating for example that the tendency to relate to anxiety as bad predicts avoidance behavior[12] and that avoidance of stimuli due to attempts at thought suppression transfers to novel stimuli through derived relational responding.[13]

Relatedly, the derived functions of relational behavior (thinking) can become a dominant source of stimulus control, leading to rigid patterns of behavior that are insensitive to the direct environment and consequences (e.g., depressive patterns of being withdrawn from other people due to thoughts like "nobody likes me," while missing opportunities for social engagement or

signs of being accepted/loved by others). This combination of increased potential for aversive experiences, a tendency for experiential avoidance, and rigid patterns of behavior under the control of cognitions that are insensitive to current context form a process termed psychological inflexibility, in which behavior is excessively guided/dominated by internal experiences at the expense of what would be more effective or valued.

Consistent with the analytic goals of functional contextualism, RFT not only provides a basic account for understanding psychopathology, but also highlights manipulable variables to influence the behavioral patterns. In addition to altering context to change what relations are derived (cognitive change), RFT suggests that the literal context of thoughts might be altered such that these relations do not have the same functions (cognitive defusion). Interventions focused on changing the function of thoughts are done primarily by shifting from a literal context of relating to thoughts (e.g., "I can't handle my life" is literally true and so I have to give up) to a non-literal context (e.g., "I'm having the thought I can't handle my life. Thanks for the thought mind" and then moving on with the next activity for the day).

Relational behavior can also be used to increase effective behavior. For example, by verbally augmenting potential reinforcers for behavior (i.e., values or motivational work). A behavior such as having a difficult conversation with a family member may be altered to be experienced as positively reinforcing through its participation in a hierarchical relation with values – "discussing this with my brother is a part of being the genuine, caring person I want to be." As another example, specific relational frames might be emphasized in clinical interventions, such as research suggesting that the use of hierarchical frames (that one contains these experiences as part of an observing self) may enhance the impact of ACT exercises focused on practicing psychological flexibility with cognitions.[14]

As this brief review highlights, RFT provides a basic behavioral account of language that is consistent with the functional contextual emphasis on achieving prediction and influence of behavior. It does so primarily by identifying how relatively automatic patterns and effects of behavior are contextually controlled and can be targeted to change behavior. This provides a foundation from which the ACT model for psychopathology and clinical intervention can be developed.

Psychological flexibility

As just described in the previous sections, the understanding of RFT provides guidance on ways to conceptualize cognition and overt actions, much like research on extinction provides guidance on how we think about responding to anxiety and fear. We can use this information to understand and design treatments. Just like how we teach exposure and response prevention for the treatment of many anxiety disorders, we can teach a set of basic therapy skills and principles, without needing to fully understand and appreciate the depth of how the basic principles function. Thus, one can learn about the following six processes of change without a full understanding of RFT. In ACT we call these midlevel terms, indicating that the construct is based off a principle, but that users should remember that it is a construct. Midlevel terms are easy to disseminate, but will lack the specificity of the actual principle.

The concept of psychological flexibility is the ability to stay in contact with inner experiences, allow them to be there when useful, see thoughts as just thoughts, have strong sense of life direction, and pursue things that are meaningful. Psychological flexibility is made up of six processes of change that all work together. Sometimes the six processes of change are divided into the "acceptance and mindfulness processes" and the "behavior change" processes. The acceptance and mindfulness processes include acceptance, defusion, being present, and self

as context; these processes help lessen the impact of inner experiences that make following

values difficult. The behavior change processes involve determining directions for behavior

change and using supported techniques to facilitate that change. While these two sets of

processes seem different at first glance, as one works with them it is clearer that acceptance and

mindfulness processes and behavior change processes are interrelated. Additionally, a recent

meta-analysis supports the utility of each process of change on its own, done outside of a larger

therapy context.[15]

Acceptance is the opposite of experiential avoidance. Acceptance involves allowing inner

experiences to occur without attempting to alter or lessen their presence in the current moment or

in the future. Acceptance is an action; it is a way one behaves—not an attitude of a feeling. One

easy example of an acceptance exercise is to suggest that one treats their anxiety like they might

treat a child who is screaming for a treat in a grocery store.

The second process is *defusion*, which is the opposite of fusion. Being defused with inner

experiences involves seeing those inner experiences as they are (a sound, symbol, just a thought)

without their transformed functions (what the mind adds to them). Fusion, involves adding

function to inner experiences due to derived relations. Instead of simply having a fast beating

heart and sweaty hands, these experiences are felt as "bad" and "dangerous." When anxiety is

experienced this way, it is more likely to occasion avoidance. It should be noted that the two

poles of all these processes are not good and bad, they are always contextually dependent. For

example, fusion is useful when doing taxes, but usually problematic when swinging a golf club.

The third process of change is *self as context*, which can be thought of as defusion

applied to self evaluations. Self as content involves experiencing those self-evaluations as

literally true and therefore allowing them to influence actions that are unwanted. For example, a

self-evaluation of being tough may be helpful in a situation such as a race or a competition, but that same self-evaluation may negatively influence actions when in a serious discussion or in a romantic relationship.

The fourth process in this area is *being present*. This is much like mindfulness, focusing on flexibly shifting attention to relevant stimuli. The goal is to have clients be attentive and responsive to what is happening in their current situation, to maximize the potential for effective, valued action. Again, someone experiencing a panic attack may be drawn to focus on physiological sensations. There may be times when that is useful, but in many circumstances, it is also useful to pay attention to the other interesting stimuli in one's environment. Similarly, for someone with generalized anxiety disorder, focusing on cognitive activity can be useful, but there are times when it is not useful and attention should be placed on what is occurring in the immediate environment.

The final two processes focus on behavior change, although note that in ACT, clients practice mindfulness and acceptance while engaging in such behavior change efforts. *Values* in ACT are areas of life that are important to the person and motivate actions. Through conversation, actions can be tied to values, thus making those small actions more meaningful. For example, if a father values his family, the therapist might say, "engaging in this exercise will bring you one step closer to that vacation with your family. Let's do this for that reason." Such a statement will make the aversive behavioral exercise, a little more positive. The behavioral *commitment* part of ACT is the place where traditional behavioral techniques are integrated. Because ACT is a behavioral intervention, traditional behavioral exercises make a lot of sense. ACT just also focuses on the role of language and cognition in such behavior change strategies.

Psychological Flexibility and Anxiety and Depression

Like many forms of cognitive behavior therapy, ACT conceptualizations are function based, not topography based. ACT is an intervention for issues where psychological inflexibility is a large factor in the disorder. Thus, a functional assessment is necessary to determine if psychological inflexibility has a large role in any particular case of anxiety or depression, but it is very likely that it would be the case. There are book length discussions of ACT for anxiety[16] and depression,[5] and the data supporting correlational work between measures of psychological inflexibility and anxiety[17] and depression are strong.[18] In addition, to the outcome studies on anxiety or depression individually, there are a few studies that used a similar protocol to address both clinical issues in one setting.[19]

Anxiety Disorders

The ultimate goal of ACT for anxiety disorders is to help those in treatment function better with the anxiety (or related symptoms) that they are experiencing. Learning how to function with these inner experiences (e.g., worry in GAD, obsessions in OCD) is not a means to necessarily lessen those experiences; it is the process through which clients are able to function better. When anxiety is experienced from a psychologically flexible posture, it has less impact on the behavioral choices that are made. Thus, as a client participates in ACT they are able to start living in ways that are more meaningful to them partially because their thoughts, urges, and feelings have less impact on their actions and choices. As the client becomes more skilled at engaging in valued actions instead of avoiding inner experiences, this skill increases. It becomes easier to allow the inner experiences to occur and continue on with life. Via the processes of habituation and extinction, one may experience changes in anxiety responses. In ACT, this is considered a byproduct of treatment rather than a goal of treatment. This is an interesting challenge for clinical trial research from an ACT standpoint because we are more focused on

overt behavioral changes rather than internal behavioral changes. However, most primary outcome measures used in treatment outcome work have a mix of changes to internal events and overt actions. Nevertheless, as will be reviewed in the following paragraphs, ACT generally has positive impacts on standard symptom measures across a variety of anxiety disorders. All RCTs are reviewed in Table 1.

Mixed Anxiety

Starting with mixed anxiety disorders is appropriate because ACT has always been a unified treatment protocol for issues where psychological inflexibility is a core concern. RCTs have shown the utility of ACT as administered by student therapists at a college counseling center for clients with anxiety and depression,[19] in a large well-controlled RCT,[20] for children,[21] and finally in a bibliotherapy format.[22] Additionally, a web-based intervention for college students with mixed issues also showed that ACT successfully reduced anxiety.[23] Support for psychological flexibility as a process of change in ACT exists in all of these RCTs. In two additional publication, Arch et al. showed shared and nonshared mediational differences between CBT and ACT.[24] Moderation effects for that same trial were also found in that CBT performed better for those with moderate levels of pretreatment anxiety sensitivity, and ACT performed better for those with comorbid disorders.[25]

Generalized Anxiety Disorder

Most of the research on ACT for GAD comes from the work of Roemer and Orsillo, who named their treatment acceptance-based behavior therapy (ABBT) rather than ACT because it is informed by multiple avenues of research. Their work is commonly included in reviews because AABT shares techniques and processes of changes with ACT.[17] In their first work, Roemer and

Orsillo[26] tested AABT in an open trial with 16 adults diagnosed with GAD. Results were promising with large effect sizes at post and follow-up with 75% responders at post and 50% at follow-up. These authors went on to test their treatment in two RCTs; one against a WL[27] and on against an active control condition.[28] More specific ACT protocols have been tested with older adults,[29] against a CBT protocol,[30] and delivered via a website with therapist support.[31] Process of change publications support session-by-session changes in acceptance of internal experiences and engagement in valued actions for AABT for GAD.[32] Similarly, experiential avoidance and psychological flexibility mediated outcomes in AABT and applied relaxation for GAD.[33]

Panic Disorder

In a unique open trial, the utility of exposure exercises done from an ACT standpoint were tested with 11 adults diagnosed with panic disorder.[34] Each participant participated in 4 sessions of ACT, then 6 sessions of self-guided exposure exercises. They were asked to only use the ACT training they had received to guide their exposure work. A significant decrease in panic disorder was seen after the first 4 sessions, with additional significant gains found in the following 6 sessions. Eight of the 11 participants were considered responders. A full RCT (ACT vs waitlist) was conducted with 43 adults who were nonresponders to previous treatments for panic disorder.[35] The between group effect size was $d=.72$ for panic and $d=.89$ for general functioning. Large effect sizes were also seen for psychological flexibility. Finally, response rates for the ACT condition were 70% at posttreatment and 80% at 6 month follow-up for panic disorder symptoms.

Social Anxiety Disorder

A study so small (N=11) that randomization could not be used showed equivalent results for group ACT and group CBT.[36] In addition, there have been four open trials evaluating ACT in a face-to-face therapy format.[37-40] Furthermore, Yuen et al. has tested ACT for social anxiety when delivered through a virtual environment [41] and using video conferencing software.[42] In addition, to these seven uncontrolled studies, there have been five RCTs of ACT. Three of these were compared to waitlists,[43-45] one were compared to CBT,[46] and another to waitlist and CBT.[47] The England study[46] had more of a focus on the underlying model of ACT in that it tested exposure exercises delivered from an ACT model vs an habituation model. The Craske et al[44] study was quite large (N=87) and showed that lower psychological flexibility at pre was associated with greater improvement at 12 month follow-up in CBT over ACT; the same was true of fear of negative evaluations.

Obsessive Compulsive Disorder

ACT as a treatment for OCD has been tested in handful of single case designs.[48-51] This includes OCD in general,[52] scrupulsosity,[49] and child and adolescent OCD.[48,51] The first randomized trial of ACT compared a 8 week protocol to an active control.[53] Since then researchers out of Iran have continued much of this work and have compared this protocol to a long list of control conditions.[54-56] This works is interesting as it shows the protocol can be useful across cultures and implemented with little direct training. In addition, but only lightly covered in this paper, ACT and ACT plus behavior therapy have been found to be useful for OC-related disorders including trichotillomania, excoriation disorder, body dysmorphic disorder.[17] Analyses of processes of change supported psychological flexibility as a mediator of long-term outcomes of ACT for OCD.[57]

Health Anxiety and Specific Phobia

An open trial showed strong results with a 49% reduction in health anxiety.[58] This was followed by a RCT comparing ACT for health anxiety to a wait-list with positive results.[59] Two studies tested ACT protocols for individuals with school-related anxiety. In the first study of ACT for math anxiety, 24 college students were randomized to ACT or systematic desensitization delivered over 6 weeks.[60] The conditions had equivalent effects on math anxiety. In the second study, 16 students were assigned to CT or AABT for test anxiety.[61] There were surprising results in that those in the AABT condition did markedly better on exams and those in the CT condition did worse.

Depressive Disorders

Depression was one of the first clinical problems evaluated with ACT[62] and one of the most studied problems since, with 17 RCTs published over the past three decades. ACT overlaps with behavioral activation in emphasizing a goal of increasing engagement in meaningful patterns of activity among depressed clients. Similar to anxiety disorders, the goals of ACT for depression are not to eliminate depression per se, but to increase clients' engagement in effective, valued activities in their life. Yet, ACT somewhat diverges from behavioral activation and mirrors traditional CBT in that additional emphasis is placed on targeting cognitive and related psychological barriers that may impede valued action. Results from RCTs to-date on ACT for depression are provided in Table 2.

Depression RCT Comparison Conditions

Several RCTs have been conducted comparing ACT to various control conditions including waitlists, treatment-as-usual (TAU), placebo conditions, and CT/CBT. Seven RCTs compared ACT to waitlist conditions on depression, with every study showing that ACT

improves depression relative to no treatment up to 6-month follow up. Between condition effect sizes ranged widely across studies (Cohen's *d* ranging from .32 to 1.18).

Five RCTs compared ACT to TAU on depression, with 4 out of 5 studies showing ACT improves depression more than TAU up to 18-month follow up. Between condition effect sizes again ranged widely across studies (*d* ranging from .38 to .1.45). Two other RCTs compared ACT to minimally active comparison conditions (expressive writing and minimal support group) on depression. Both studies found ACT outperformed comparison conditions on depression at post, but were equivalent at follow up.

Finally, five RCTs compared ACT to CT or CBT on depression. At post, 4 out of 5 studies found ACT and CT/CBT were equivalent in improving depression, with the remaining study finding ACT led to greater improvements than CT. Results were more mixed at follow up, with one studying finding ACT and CBT were equivalent on depression at 6-month follow up, one study finding CT outperformed ACT on depression at 18-month follow up, and two studies finding ACT outperformed CT on depression at 2-month follow up.

Overall these studies suggest that ACT is effective for depression relative to no treatment, treatment-as-usual, or placebo conditions. It is less clear how ACT compares to CBT due to the number of trials and tendency for small sample sizes in existing studies, but results suggest it is likely at least equally effective for depression, with some questions raised regarding which treatment may be more effective at follow up.

Depression RCT Sample Types

ACT has been adopted internationally, which is demonstrated by the range of countries that have published RCTs on ACT for depression (even when this review was restricted to English-language publications). Overall, 8 depression RCTs were conducted in Europe (3 in the

Netherlands, 2 in Finland, 2 in Sweden, 1 in Spain), 6 in the United States, 2 in Australia, and 1 in Iran. An additional 5 depression RCTs were excluded due to not being available in English: 1 from Iran[63] and 1 from China[64] and 3 from Korea (Cho, 2012; Kim & Park, 2014; Yang & Shin, 2013).[65-67] Results from RCTs across various countries suggest ACT has similar efficacy when adapted and implemented outside the US.

Consistent with its transdiagnostic approach to treatment, ACT has also been evaluated in RCTs targeting more unique and complex depressive samples. RCTs indicate that ACT leads to greater improvements in depression relative to comparison conditions for depressed individuals with comorbid migraines,[68] with comorbid psychosis,[69] caregivers of family members with dementia,[70] and individuals on long-term sick leave.[71] Another RCT[72] found equivalent effects for ACT relative to TAU among individuals with comorbid alcohol and depressive disorders, although it is worth noting that the ACT condition led to less required treatment prior to discharge from the inpatient unit (i.e., greater treatment efficiency). The vast majority of RCTs have focused on adult samples, but ACT has also been found to be effective in treating adolescents with depression in two RCTs. Additional open trials have found ACT to produce improvements over time with depression in unique/complex samples including comorbid depression and social anxiety disorder,[73] comorbid depression and obesity,[74] and depressed veterans in the US (Walser et al., 2013).[75] Overall, these studies suggest ACT is a promising approach to apply to specific depressed populations, including those struggling with comorbid psychological or behavioral health challenges.

Depression RCT Treatment Formats

Individual (one-on-one) therapy is the most common treatment format ACT has been evaluated in for depression, with a total of seven RCTs. These studies found ACT outperforms

waitlist, TAU, and a minimal support group, with largely equivalent effects relative to CT/CBT. Among studies reporting rates, ACT response rates ranged from 50% to 58% with depression recovery rates ranging from 24% to 82%.

ACT has also been evaluated in 6 RCTs in a group format, one of which used a single day workshop format.[68] These studies similarly found ACT outperforms waitlist and TAU, with equivalent or greater outcomes relative to CT. ACT response rates ranged between 27 and 36% in the one study reporting reliable change,[71] and 77% recovered from depression in ACT at 3 month follow up after a one day workshop.[68]

Four RCTs evaluated ACT in a self-help format for depression, with three using an online delivery format and one testing a self-help book with email support. These studies almost exclusively compared ACT to waitlist, finding that ACT produces significant improvements in depression relative to no treatment at post and up to 6-month follow up with effect sizes ranging between Cohen's *d* of .32 and .98. ACT delivered online also outperformed an active comparison condition of expressive writing at post, though both conditions had equivalent positive effects at depression at follow-up (Pots). Response rates from ACT varied between 25% and 54%, with one study finding that 50% recovered from depression following an ACT self-help program (Lappalainen).

One additional RCT, excluded from the table due to not including a non-ACT condition, compared ACT delivered through an online program (with minimal therapist contact) versus face-to-face therapy among 38 depressed adults from Finland.[76] Participants receiving an online program actually demonstrated stronger improvements at 6-month follow up on depressive symptoms ($g = .76$) and life satisfaction ($g = .75$) relative to face-to-face ACT. Although whether ACT consistently leads to larger effects in online formats is questionable and requires

further study, these results at least suggest that ACT can be delivered in an online format with similar impact on depression.

Overall, these studies indicate that ACT is effective across a variety of modalities for depression including individual therapy, group therapy, and self-help. These include formats that are especially promising for increasing the reach of services in cost effective formats such as one-day workshops, self-help books, and websites. This is consistent with a recent review of treatments for depression in which recommendations were made to focus research efforts on such cost effective methods for expanding depression services[77]

Depression RCT Outcomes with Positive Mental Health and Quality of Life

Although showing ACT reduces depressive symptoms helps demonstrate its relevance for depressed populations, it is important to also consider whether this treatment improves positive mental health and quality of life, which are also important outcomes that fit particularly well with the goals of ACT. Nine of the 17 RCTs evaluated the impact of treatment on quality of life (including quality of life, positive mental health and/or functioning). ACT improved quality of life relative to waitlist in four out of five trials with Cohen's *d* effect sizes ranging between .39 and 1.03, up to 3-month follow up. ACT also improved quality of life relative to TAU in two trials ($d = .71 - .78$), expressive writing in one trial ($d = .35$), and minimal support group in one trial ($d = .62$). However, ACT was generally equivalent to CBT/CT on quality of life in the two trials including this measure, with CT actually outperforming ACT on quality of life in one case at 18-month follow up.[78]

Overall, these results indicate that ACT improves quality of life in addition to symptom severity among depressed samples, although it is unclear how efficacy compares to CBT in this domain.

Depression RCT Processes of Change

Twelve of 17 depression ACT RCTs examined processes of change (psychological flexibility and its specific component processes). Studies found that ACT produced greater improvements in psychological flexibility relative to waitlist in three RCTs (Cohen's *d* ranging from .50 to .67), relative to TAU in three RCTs (*d* ranging from .64 - .76) and relative to placebo conditions (expressive writing *d* = .43, minimal support group *d* = .77). However, only two of four RCTs found that ACT improved psychological flexibility relative to CT/CBT, with the other two studies finding equal improvements between conditions.

Formal mediational analyses in three RCTs indicated that changes in psychological flexibility mediated the impact of ACT relative to waitlist on depression. One additional study found through formal mediational analyses that cognitive defusion mediated the impact of ACT versus CT on depression.[79]

Overall, these results indicate that ACT appears to effective target its key mechanism of change, psychological flexibility, and that improvements in psychological flexibility mediate treatment outcomes with most comparison conditions. However, the differential impact of ACT on psychological inflexibility relative to CT/CBT is inconsistent and somewhat unclear based on the existing literature.

Conclusions

The goal for this manuscript was to present the model from which ACT research occurs as well as provide an exhaustive list of all published work on ACT for anxiety disorders and depression. As ACT is a unified treatment protocol and there is a growing number of trials testing ACT across anxiety and depression issues. This base of knowledge provides initial support for ACT. There is a larger amount of work on ACT for GAD, social anxiety, and OCD.

The work in panic disorder and health anxiety is in its infancy; there has been very little with specific phobias. However, there is also a large amount of research indicating ACT is effective for depression, and potentially as effective as traditional CBT.

After an earlier debate about the differences and similarities between ACT and more traditional CBT,[80] ACT is now generally considered part of a new generation of CBT approaches focused on process-based treatments.[81,82] As one of the modern CBTs, there are a number of areas for future research with ACT (e.g., optimizing dissemination and implementation, studying mechanisms of change, moderators). For example, there is a need to clarify which clients might benefit more from traditional CBT or ACT within the depression and anxiety disorders. This may be particularly true for anxiety disorders in which the current research is fairly limited with some specific disorders and further work is needed to clarify the potential efficacy of ACT and treatment matching factors. Overall, ACT's evidence base for depressive and anxiety disorders continues to grow, indicating this unique, modern CBT is a promising treatment approach warranting dissemination and further study.

1. Hayes SC, Strosahl KD, Wilson KG. *Acceptance and commitment therapy: The process and practice of mindful change (2nd ed.).* New York, NY US: Guilford Press; 2012.
2. Skinner BF. *Verbal behavior.* East Norwalk, CT, US: Appleton-Century-Crofts; 1957.
3. Hayes SC, Barnes-Holmes D, Roche B. *Relational frame theory: A post-Skinnerian account of human language and cognition.* New York, NY US: Kluwer Academic/Plenum Publishers; 2001.
4. Dougher M, Twohig MP, Madden GJ. Editorial: Basic and translational research on stimulus–stimulus relations. *Journal of the Experimental Analysis of Behavior.* 2014;101(1):1-9.
5. Zettle RD, Hayes SC, Barnes-Holmes D, Biglan A. *The Wiley handbook of contextual behavioral science.* Wiley-Blackwell; 2016.
6. Hayes SC, Long DM, Levin ME, Follette WC. Treatment development: Can we find a better way? *Clinical Psychology Review.* 2013;33(7):870-882.
7. Hayes SC, Levin ME, Plumb-Vilardaga J, Villatte JL, Pistorello J. Acceptance and commitment therapy and contextual behavioral science: Examining the progress of a distinctive model of behavioral and cognitive therapy. *Behavior Therapy.* 2013;44(2):180-198.
8. Hayes SC, Hayes LJ, Reese HW. Finding the philosophical core: A review of Stephen C. Pepper's World Hypotheses: A Study in Evidence. *Journal of the experimental analysis of behavior.* 1988;50(1):97-111.
9. Hayes SC, Barnes-Holmes D, Wilson KG. Contextual behavioral science: Creating a science more adequate to the challenge of the human condition. *Journal of Contextual Behavioral Science.* 2012;1(1):1-16.
10. Levin ME, Luoma JB, Haeger JA. Decoupling as a mechanism of change in mindfulness and acceptance: a literature review. *Behavior modification.* 2015;39(6):870-911.
11. De Houwer J, Dymond S, Roche B. *Advances in relational frame theory: Research and application.* New Harbinger Publications; 2013.
12. Levin ME, Haeger J, Smith GS. Examining the Role of Implicit Emotional Judgments in Social Anxiety and Experiential Avoidance. *Journal of Psychopathology and Behavioral Assessment.* 2016:1-15.
13. Hooper N, Sandoz EK, Ashton J, Clarke A, McHugh L. Comparing thought suppression and acceptance as coping techniques for food cravings. *Eating behaviors.* 2012;13(1):62-64.
14. Foody M, Barnes-Holmes Y, Barnes-Holmes D, Rai L, Luciano C. An empirical investigation of the role of self, hierarchy, and distinction in a common act exercise. *The Psychological Record.* 2015;65(2):231-243.
15. Levin ME, Hildebrandt MJ, Lillis J, Hayes SC. The Impact of Treatment Components Suggested by the Psychological Flexibility Model: A Meta-Analysis of Laboratory-Based Component Studies. *Behavior Therapy.* 2012;43(4):741-756.
16. Eifert GH, Forsyth JP. *Acceptance and commitment therapy for anxiety disorders: A practitioner's treatment guide to using mindfulness, acceptance, and values-based behavior change strategies.* Oakland, CA US: New Harbinger Publications; 2005.
17. Bluett EJ, Homan KJ, Morrison KL, Levin ME, Twohig MP. Acceptance and commitment therapy for anxiety and OCD spectrum disorders: An empirical review. *Journal of Anxiety Disorders.* 2014;28(6):612-624.
18. Ruiz FJ. A review of Acceptance and Commitment Therapy (ACT) empirical evidence: Correlational, experimental psychopathology, component and outcome studies. *International Journal of Psychology & Psychological Therapy.* 2010;10(1):125-162.

19.   Forman EM, Herbert JD, Moitra E, Yeomans PD, Geller PA. A randomized controlled effectiveness trial of acceptance and commitment therapy and cognitive therapy for anxiety and depression. *Behavior Modification.* 2007;31(6):772-799.

20.   Arch JJ, Eifert GH, Davies C, Vilardaga JCP, Rose RD, Craske MG. Randomized clinical trial of cognitive behavioral therapy (CBT) versus acceptance and commitment therapy (ACT) for mixed anxiety disorders. *Journal of Consulting and Clinical Psychology.* 2012;80(5):750-765.

21.   Hancock KM, Swain J, Hainsworth CJ, Dixon AL, Koo S, Munro K. Acceptance and Commitment Therapy versus Cognitive Behavior Therapy for Children With Anxiety: Outcomes of a Randomized Controlled Trial. *Journal of Clinical Child & Adolescent Psychology.* 2016:1-16.

22.   Ritzert TR, Forsyth JP, Sheppard SC, Boswell JF, Berghoff CR, Eifert GH. Evaluating the effectiveness of ACT for anxiety disorders in a self-help context: Outcomes from a randomized wait-list controlled trial. *Behavior Therapy.* 2016;47(4):444-459.

23.   Levin ME, Haeger JA, Pierce BG, Twohig MP. Web-based Acceptance and Commitment Therapy for Mental Health Problems in College Students: A Randomized Controlled Trial. *Behavior Modification.* 2017;41(1):141-162.

24.   Arch JJ, Wolitzky-Taylor KB, Eifert GH, Craske MG. Longitudinal treatment mediation of traditional cognitive behavioral therapy and acceptance and commitment therapy for anxiety disorders. *Behaviour Research and Therapy.* 2012;50(7):469-478.

25.   Wolitzky-Taylor KB, Arch JJ, Rosenfield D, Craske MG. Moderators and non-specific predictors of treatment outcome for anxiety disorders: A comparison of cognitive behavioral therapy to acceptance and commitment therapy. *Journal of Consulting and Clinical Psychology.* 2012;80(5):786.

26.   Roemer L, Orsillo SM. An open trial of an acceptance-based behavior therapy for generalized anxiety disorder. *Behavior Therapy.* 2007;38(1):72-85.

27.   Roemer L, Orsillo SM, Salters-Pedneault K. Efficacy of an acceptance-based behavior therapy for generalized anxiety disorder: Evaluation in a randomized controlled trial. *Journal of Consulting and Clinical Psychology.* 2008;76(6):1083-1089.

28.   Hayes-Skelton SA, Roemer L, Orsillo SM. A randomized clinical trial comparing an acceptance-based behavior therapy to applied relaxation for generalized anxiety disorder. *Journal of consulting and clinical psychology.* 2013;81(5):761.

29.   Wetherell JL, Liu L, Patterson TL, et al. Acceptance and commitment therapy for generalized anxiety disorder in older adults: A preliminary report. *Behavior therapy.* 2011;42(1):127-134.

30.   Avdagic E, Morrissey SA, Boschen MJ. A randomised controlled trial of acceptance and commitment therapy and cognitive-behaviour therapy for generalised anxiety disorder. *Behaviour Change.* 2014;31(02):110-130.

31.   Dahlin M, Ryberg M, Vernmark K, Annas N, Carlbring P, Andersson G. Internet-delivered acceptance-based behavior therapy for generalized anxiety disorder: A pilot study. *Internet Interventions.* 2016;6:16-21.

32.   Hayes SA, Orsillo SM, Roemer L. Changes in proposed mechanisms of action during an acceptance-based behavior therapy for generalized anxiety disorder. *Behaviour Research and Therapy.*48(3):238-245.

33.   Eustis EH, Hayes-Skelton SA, Roemer L, Orsillo SM. Reductions in experiential avoidance as a mediator of change in symptom outcome and quality of life in acceptance-based behavior therapy and applied relaxation for generalized anxiety disorder. *Behaviour Research and Therapy.* 2016;87:188-195.

34.   Meuret AE, Twohig MP, Rosenfield D, Hayes SC, Craske MG. Brief Acceptance and Commitment Therapy and Exposure for Panic Disorder: A Pilot Study. *Cognitive and Behavioral Practice.* 2012;19(4):606-618.

35.   Gloster AT, Sonntag R, Hoyer J, et al. Treating treatment-resistant patients with panic disorder and agoraphobia using psychotherapy: a randomized controlled switching trial. *Psychotherapy and psychosomatics.* 2015;84(2):100-109.

36.   Block JA, Wulfert E. Acceptance or change: Treating socially anxious college students with ACT or CBGT. *The Behavior Analyst Today.* 2000;1(2):1-55.

37.   Dalrymple KL, Herbert JD. Acceptance and commitment therapy for generalized social anxiety disorder: A pilot study. Sage Publications2007.

38.   Dalrymple KL, Morgan TA, Lipschitz JM, Martinez JH, Tepe E, Zimmerman M. An integrated, acceptance-based behavioral approach for depression with social anxiety: Preliminary results. *Behavior modification.* 2014.

39.   Kocovski NL, Fleming JE, Rector NA. Mindfulness and acceptance-based group therapy for social anxiety disorder: An open trial. Elsevier Science2009.

40.   Ossman WA, Wilson KG, Storaasli RD, McNeill JW. A preliminary investigation of the use of Acceptance and Commitment Therapy in a group treatment for social phobia. *International Journal of Psychology & Psychological Therapy.* 2006;6(3):397-416.

41.   Yuen EK, Herbert JD, Forman EM, Goetter EM, Comer R, Bradley J-C. Treatment of social anxiety disorder using online virtual environments in second life. *Behavior Therapy.* 2013;44(1):51-61.

42.   Yuen EK, Herbert JD, Forman EM, et al. Acceptance based behavior therapy for social anxiety disorder through videoconferencing. *Journal of Anxiety Disorders.* 2013;27(4):389-397.

43.   Yadegari L, Hashemiyan K, Abolmaali K. Effect of acceptance and commitment therapy on young people with social anxiety. *International Journal of Scientific Research in Knowledge.* 2014;2(8):395.

44.   Craske MG, Niles AN, Burklund LJ, et al. Randomized controlled trial of cognitive behavioral therapy and acceptance and commitment therapy for social phobia: outcomes and moderators. *Journal of consulting and clinical psychology.* 2014;82(6):1034.

45.   Rostami M, Veisi N, Jafarian Dehkordi F, Alkasir E. Social Anxiety in Students with Learning Disability: Benefits of Acceptance and Commitment Therapy. *Practice in Clinical Psychology.* 2014;2(4):277-284.

46.   England EL, Herbert JD, Forman EM, Rabin SJ, Juarascio A, Goldstein SP. Acceptance-based exposure therapy for public speaking anxiety. *Journal of Contextual Behavioral Science.* 2012;1(1):66-72.

47.   Kocovski NL, Fleming JE, Hawley LL, Huta V, Antony MM. Mindfulness and acceptance-based group therapy versus traditional cognitive behavioral group therapy for social anxiety disorder: A randomized controlled trial. *Behaviour research and therapy.* 2013;51(12):889-898.

48.   Armstrong AB, Morrison KL, Twohig MP. A preliminary investigation of acceptance and commitment therapy for adolescent obsessive-compulsive disorder. *Journal of Cognitive Psychotherapy.* 2013;27(2):175-190.

49.   Dehlin JP, Morrison KL, Twohig MP. Acceptance and commitment therapy as a treatment for scrupulosity in obsessive compulsive disorder. *Behavior Modification.* 2013;37(3):409-430.

50.   Twohig M, Hayes S, Masucla A. Increasing willingness to experience obsessions: Acceptance and commitment therapy as a treatment for obsessive-compulsive disorder. *Behavior Therapy.* 2006;37(1):3-13.

51.   Barney JY, Field CE, Morrison KL, Twohig MP. TREATMENT OF PEDIATRIC OBSESSIVE COMPULSIVE DISORDER UTILIZING PARENT-FACILITATED ACCEPTANCE AND COMMITMENT THERAPY. *Psychology in the Schools.* 2017;54(1):88-100.

52.   Twohig MP, Hayes SC, Masuda A. Increasing willingness to experience obsessions: Acceptance and commitment therapy as a treatment for obsessive-compulsive disorder. *Behavior Therapy.* Vol 37: Elsevier; 2006:3-13.

53.   Twohig M, Hayes S, Plumb J, et al. A Randomized Clinical Trial of Acceptance and Commitment Therapy Versus Progressive Relaxation Training for Obsessive-Compulsive Disorder. *Journal of Consulting and Clinical Psychology.* 2010;78(5):705-716.

54.   Vakili Y, Gharraee B, Habibi M, Lavasani F, Rasoolian M. The Comparison of Acceptance and Commitment Therapy with Selective Serotonin Reuptake Inhibitors in the Treatment of Obsessive-Compulsive Disorder. *Zahedan Journal of Research in Medical Sciences.* 2014;16(10):10-14.

55.   Baghooli H, Dolatshahi B, Mohammadkhani P, Moshtagh N, Naziri G. Effectiveness of acceptance and commitment therapy in reduction of severity symptoms of patients with obsessive-compulsive disorder. *Advances in Environmental Biology.* 2014:2519-2525.

56.   Esfahani M, Kjbaf MB, Abedi MR. Evaluation and comparison of the effects of time perspective therapy, acceptance and commitment therapy and narrative therapy on severity of symptoms of obsessive-compulsive disorder. *Journal of the Indian Academy of Applied Psychology.* 2015;41(3):148.

57.   Twohig MP, Vilardaga JCP, Levin ME, Hayes SC. Changes in psychological flexibility during acceptance and commitment therapy for obsessive compulsive disorder. *Journal of Contextual Behavioral Science.* 2015;4(3):196-202.

58.   Eilenberg T, Kronstrand L, Fink P, Frostholm L. Acceptance and commitment group therapy for health anxiety–Results from a pilot study. *Journal of Anxiety Disorders.* 2013;27(5):461-468.

59.   Eilenberg T, Fink P, Jensen J, Rief W, Frostholm L. Acceptance and commitment group therapy (ACT-G) for health anxiety: a randomized controlled trial. *Psychological medicine.* 2016;46(01):103-115.

60.   Zettle RD. Acceptance and commitment therapy (ACT) vs. systematic desensitization in treatment of mathematics anxiety. *The Psychological Record.* 2003;53(2):197-215.

61.   Brown LA, Forman EM, Herbert JD, Hoffman KL, Yuen EK, Goetter EM. A randomized controlled trial of acceptance-based behavior therapy and cognitive therapy for test anxiety: A pilot study. Sage Publications.

62.   Zettle RD, Hayes SC. Component and process analysis of cognitive therapy. *Psychological Reports.* 1987;61(3):939-953.

63.   Dabbaghi P, Dowran B, Taghva A. Effectiveness of group training of acceptance and commitment therapy on depression symptoms in soldiers. *EBNESINA.* 2016;18(2):19-25.

64.   Zhao W, Zhou, Y., Liu, X., & Ran, L. . Effectiveness of acceptance and commitment therapy on depression. *Chinese Journal of Clinical Psychology.* 2013;21(1):253-157.

65.   Cho HJ. The development and effect of a ACT Program based on Loving-kindness Meditation for depressive students. *Korean journal of counseling and psychology.* 2012;24(827-846).

66.   Yang SYS, H.K. . Effects of Acceptance and Commitment Therapy on Psychological Acceptance, Psychological Well-being, Depression and Suicidal Ideation of Depressed College students. *The Korean Journal of Clinical Psychology.* 2013;32.

67.   Kim HEP, K. . The Effects of Process Variables in Acceptance Commitment Therapy for Women's Depression. *The Korean Journal of Clinical Psychology.* 2014;33.

68.   Dindo L, Recober A, Marchman JN, Turvey C, O'Hara MW. One-day behavioral treatment for patients with comorbid depression and migraine: a pilot study. *Behaviour research and therapy.* 2012;50(9):537-543.

69.   Gaudiano BA, Busch AM, Wenze SJ, Nowlan K, Epstein-Lubow G, Miller IW. Acceptance-based behavior therapy for depression with psychosis: Results from a pilot feasibility randomized controlled trial. *Journal of psychiatric practice.* 2015;21(5):320.

70.   Losada A, Márquez-González M, Romero-Moreno R, et al. Cognitive–behavioral therapy (CBT) versus acceptance and commitment therapy (ACT) for dementia family caregivers with

significant depressive symptoms: Results of a randomized clinical trial. *Journal of consulting and clinical psychology.* 2015;83(4):760.

71.   Folke F, Parling T, Melin L. Acceptance and commitment therapy for depression: A preliminary randomized clinical trial for unemployed on long-term sick leave. *Cognitive and Behavioral Practice.* 2012;19(4):583-594.

72.   Petersen CL, Zettle RD. Treating inpatients with comorbid depression and alcohol use disorders: A comparison of acceptance and commitment therapy versus treatment as usual. *The Psychological Record.* 2009;59(4):521.

73.   Dalrymple KL, Morgan TA, Lipschitz JM, Martinez JH, Tepe E, Zimmerman M. An integrated, acceptance-based behavioral approach for depression with social anxiety: Preliminary results. *Behavior modification.* 2014;38(4):516-548.

74.   Berman MI, Morton SN, Hegel MT. Uncontrolled pilot study of an Acceptance and Commitment Therapy and Health at Every Size intervention for obese, depressed women: Accept Yourself! *Psychotherapy.* 2016;53(4):462.

75.   Walser RD, Karlin BE, Trockel M, Mazina B, Taylor CB. Training in and implementation of Acceptance and Commitment Therapy for depression in the Veterans Health Administration: Therapist and patient outcomes. *Behaviour Research and Therapy.* 2013;51(9):555-563.

76.   Lappalainen P, Langrial S, Oinas-Kukkonen H, Tolvanen A, Lappalainen R. Web-based acceptance and commitment therapy for depressive symptoms with minimal support: a randomized controlled trial. *Behavior modification.* 2015;39(6):805-834.

77.   Cuijpers P. Four decades of outcome research on psychotherapies for adult depression: An overview of a series of meta-analyses. *Canadian Psychology/Psychologie canadienne.* 2017;58(1):7.

78.   Forman EM, Shaw JA, Goetter EM, Herbert JD, Park JA, Yuen EK. Long-term follow-up of a randomized controlled trial comparing acceptance and commitment therapy and standard cognitive behavior therapy for anxiety and depression. *Behavior Therapy.* 2012.

79.   Zettle RD, Rains JC, Hayes SC. Processes of change in acceptance and commitment therapy and cognitive therapy for depression: A mediation reanalysis of Zettle and Rains. *Behavior Modification.* 2011;35(3):265-283.

80.   Hofmann SG. Acceptance and commitment therapy: New wave or morita therapy? *Clinical Psychology: Science and Practice.* 2008;15(4):280-285.

81.   Hayes SCH, S. G. . The third wave of CBT and the rise of process-based care. . *World Psychiatry.* 2017.

82.   Hayes SCH, S. G. (Eds.). *Process-based CBT: The science and core clinical competencies of cognitive behavioral therapy.*

. Oakland, CA: New Harbinger; 2017.

Table 1. RCTs of ACT for Anxiety Disorders

Study	Design	Outcomes
Mixed Anxiety		
Forman et al (2007)	N=101 students seeking service at college counseling center for depression or anxiety; ACT vs CBT	ACT = CBT for anxiety and depression; d = .33 for anxiety and .66 for depression both groups; 55% responders for anxiety and 61.2% for depression both groups
Arch et al. (2012)	N=128 adults; ACT vs CBT	All outcomes similar at post; ACT > CBT on CSR at 6 and 12 mo FU (d > 1); CBT > ACT on QOL at 12 mo FU (d=.42)
Hancock et al. (2016)	N=193 children, ACT vs CBT vs WL	ACT = CBT, both > WL; Large pre post d for ACT and CBT
Ritzert et al. (2016)	N= 503 adults received ACT self-help book or WL; Pre, post, between conditions; 6 and 9 mo FU on treatment only	BAI: ACT > WL pre to post; 28% post responder and 31% at 9 mo FU
Generalized Anxiety Disorder		
Roemer et al. (2008)	N=31 adults; ABBT vs WL; FU at 3 and 9 mo	PSWQ ABBT > WL, d=1.02; at post 76% in ABBT vs 16% in did not meet criteria for GAD
Wetherell et al. (2011)	N=21 older adults (M age= 70); ACT vs CBT	Feasibility study and no between group comparisons; ACT: PSWQ Pre = 69, post = 54
Hayes-Skelton et al. (2013)	N=81 adults; ABBT vs applied relaxation	AABT = applied relaxation; 63-80% responders in AABT, 60-78% responders in applied relaxation
Avdagic et al. (2016)	51 adults; group ACT vs group CBT	ACT > CBT; d=.79; 79% responders ACT, 49% CBT
Dahlin et al. (2016)	N= 103 adults; internet delivered AABT vs WL	AABT > WL; d= 0.7 to 0.98
Panic Disorder		
Gloster et al. (2015)	N=43 previous treatment nonresponders; ACT vs WL	ACT vs WL d=0.72
Social Anxiety Disorder		
England et al. (2012)	N-45 adults; nongeneralized SAD; exposure from ACT rationale vs exposure from habituation rationale	ACT > habituation model on responder rates, 100% ACT and 83% habituation
Kocovski et al. (2013)	N= 137; MAGT vs CBGT vs WL	MAGT = CBGT; both > WL; 32% MAGT and CBGT CSC
Rostami et al. (2014)	N=40 middle school students with learning disability	ACT > WL; Anxiety Scale ACT: 22 pre, 12 post; WL: 23 pre; 20 post
Yadegari et al. (2014)	N=16, 18-20 YO; ACT vs WL	ACT > WL; SPAI: ACT 134

		pre, 57 post; WL 148 pre 149 post
Craske et al. (2014)	N=87; ACT vs CBT vs WL, Assessments at pre, post, 6 mo, and 12 mo	ACT = CBT, both > WL; response rates post 52% CBT, 41% ACT, 6 mo FU 57% CBT 53% ACT, 12 mo FU 40% CBT, 41% ACT
Obsessive-Compulsive Disorder		
Twohig et al. (2010)	N=79 adults; ACT vs PRM	Response rates: ACT post = 46%–56%, FU = 46%–66%; PRT post = 13%–18%, FU = 16%–18%
Yaghoob et al. (2013)	N=27; ACT vs SSRI vs combination	ACT > SSRI; ACT = combination; CSC ACT=44, combination = 40, SSRI = 12.5
Baghooli et al. (2014)	N=90, ACT vs clomipramine vs ACT+clomipramine	ACT > clomipramine, combination = ACT; ACT Y-BOCS pre = 24, post 14, FU 11
Esfahani et al. (2015)	N=60 adults; ACT vs TPT vs NT	ACT> TPT and NT; ACT Y-BOCS pre 29, post 14, FU 16
Health Anxiety		
Eilenberg et al. 2016	N=126 adults; ACT vs WL	ACT > WL; d=.89

Note: AABT = acceptance-based behavior therapy; ACT=acceptance and commitment therapy; CBT=cognitive behavioral therapy; CSR=clinical severity rating; mo=month; d= Cohen's d; MAGT = mindfulness and acceptance-based group therapy; NT = narrative therapy; PAS = Panic and Agoraphobia Scale; PMR=progressive muscle relaxation; PSA= Public speaking anxiety; PSWQ= Penn State Worry Questionnaire; SPAI=social phobia anxiety inventory; TPT = time perspectives therapy; QOL=quality of life; WL=wait list;

Table 2. RCTs of ACT for Depression

Study	Design	Outcomes
Waitlist Comparison Conditions		
Bohlmeijer et al., (2011)	n = 93 mild to moderately depressed Dutch adults, Group ACT vs. WL	ACT > WL on depression at post (d = .60) and 3-month FU (d = .63). ACT > WL on PF at post (d = .59) and FU (d = .66). PF mediated treatment effects on depression.
Carlbring et al., (2013)	n = 80 diagnosed depressed Swedish adults, Online Self-Help ACT vs. WL	ACT > WL on depression at post (d = .98) with 25% responding to ACT vs. 5% in WL. ACT = WL on QOL at post.
Dindo et al., 2012	n = 45 patients with diagnosed comorbid depression and migraines in the US, ACT plus education workshop vs. WL	ACT > WL on depression at 3 month FU (d = 1.18) with 77% recovered from depression in ACT vs. 8% in WL. ACT > WL on QOL at FU (d = .69 – 1.03).
Fledderus et al., 2012	n = 376 mild to moderately depressed and anxious Dutch adults, Self-Help ACT with Email Support (ACT-E) vs. ACT Without Email (ACT-M) vs. WL	ACT-E and ACT-M > WL on depression at post (ACT-E d = .74, ACT-M d = .89) with 34%/39% responding to ACT-E/ACT-M vs. 6% in WL. ACT > WL on QOL at post. ACT > WL on PF at post. PF mediated treatment effects on depression (Fledderus et al., 2013).
Kohtala et al., (2015)	n = 57 depressed adults in Finland, Individual ACT vs. Waitlist.	ACT > WL on depression at post (d = .93). ACT > WL on QOL at post (d = .58 - .64). ACT > WL on PF at post (d = .61).
Lappalainen et al., (2015).	N = 39 diagnosed depressed adults in Finland, Online Self-Help ACT vs. Waitlist	ACT > WL on depression at post (g = .83) with 50% recovered from depression in ACT vs. 10% in WL. ACT > WL on PF at post (g = .53 - .67).
TAU/Active Comparison Conditions		
Folke et al. (2012)	n = 34 Swedish diagnosed depressed	ACT > TAU on depression at post and 18 month FU (d = .86) with 27% responding at post and

	adults on long-term sick leave, Group ACT vs. TAU	36% at FU in ACT vs. 0% at post and 9% at FU in TAU. ACT > TAU on QOL (d = .71).
Gaudiano et al., 2015	n = 13 patients with diagnosed comorbid depression and psychosis in the US, Individual ACT+TAU vs. TAU	ACT > TAU on depression (though not analyzed statistically) at post (d = .86) with 50% responding to ACT vs. 29% in TAU. ACT > TAU on QOL (d = .78). ACT > TAU on PF at post (not analyzed statistically; d = .64).
Hayes et al., (2011)	N = 30 depressed Australian adolescents, Individual ACT vs. TAU	ACT > TAU on depression at post (d = .38) and 3 month FU (d = 1.45) with 58% responding to ACT at post vs. 36% in TAU.
Livheim et al., 2015	N = 58 mild to moderately depressed Australian adolescent females, Group ACT vs. TAU	ACT > TAU on depression at post (d = .78). ACT > TAU on PF at post (d = .76).
Petersen & Zettle, 2009	n = 24 inpatients diagnosed with comorbid alcohol use and depressive disorder in the US, Individual ACT vs. TAU	ACT = TAU on depression at post. ACT > TAU on PF at post.
Pots et al. (2016a).	n = 236 mild to moderately depressed Dutch adults, Online Self-Help ACT vs. EW vs. waitlist	ACT > EW (d = .36) and WL (d = .56) on depression at post with 54% responding to ACT vs. 26% in WL and 31% in EW. ACT > WL on depression at 6-month FU (d = .32) and ACT = EW at FU. ACT > EW (d = .35) and WL (d = .39) on QOL at post. ACT = EW and WL at FU. ACT > WL (d = .50) and EW (d = .43) on PF at post. PF mediated ACT vs. WL treatment effects but not ACT vs. EW (Pots et al., 2016b)
CT/CBT Comparison Conditions		
Forman et al., 2007 (2012)	N = 132 US college students seeking therapy with depression and/or anxiety, Individual ACT vs. CT	CT = ACT at post on depression, CT > ACT at 18 month FU (f = .21) with 82% recovered from depression at FU in CT vs. 61% in ACT. ACT = CT at post, CT > ACT at FU on QOL (f

		= .21). ACT = CT at post on PF.
Losada et al., (2015)	n = 135 depressed dementia caregivers in Spain, Individual ACT vs. CBT vs. MSG.	ACT = CBT on depression at post and 6-month FU, ACT > MSG on depression at post (d = 1.17), ACT = MSG at FU. 24% recovered from depression at post in ACT vs. 27% in CBT and 0% in MSG. ACT > MSG on QOL at post (d = .62) and ACT = MSG on QOL at FU. ACT = CBT on QOL at post and FU. ACT > MSG on PF at post (d = .77), ACT = CT at post on PF.
Tamannaeifar et al., 2014	n = 19 diagnosed depressed adult females in Iran, Group ACT vs. CT	ACT = CT on depression at post.
Zettle & Hayes, S. C. (1986)	n = 18 depressed females in the US, individual ACT vs. CT	ACT = CT on depression at post, ACT > CT on depression at 2-month FU. ACT > CT on PF at post.
Zettle & Rains (1989)/Zettle et al., 2011	n = 25 depressed females in the US, Group ACT vs. CT	ACT > CT on depression at post and 2-month FU (d = 1.08). PF mediated treatment effects on depression (Zettle et al., 2011).

CT = Cognitive Therapy, CBT = Cognitive Behavioral Therapy, EW = Expressive Writing, FU = Follow-Up, MSG = Minimal Support Group, QOL = Quality of life, functioning, or positive mental health outcome measures, TAU = Treatment As Usual, US = United States, WL = Waitlist