Abstract

Background: Acceptance and Commitment Therapy (ACT) has been shown to promote willingness to experience intrusive thoughts among individuals with obsessive-compulsive disorder (OCD). Exposure with response prevention (ERP) delivered from an ACT framework (i.e., ACT+ERP) may facilitate changes in how patients relate to their unwanted internal experiences. Aims: Accordingly, the present study aimed to examine the effect of ACT+ERP on appraisals of intrusive thoughts, relative to standard ERP. Methods: Forty-eight adults who received 16 treatment sessions as part of a randomized controlled trial comparing standard ERP to ACT+ERP completed the Interpretation of Intrusions Inventory (III) at pre-treatment, post-treatment, and follow-up. Results: Results showed a significant main effect of time for all III subscales, suggesting that appraisals of intrusive thoughts shift over the course of treatment. The effect of the condition x time interaction, however, differed between the III subscales. Specifically, a significant interaction emerged for the control of thoughts subscale, such that individuals who received ACT+ERP experienced greater reductions in beliefs about the need to control thoughts. The interaction term was not significant for importance of thoughts or responsibility subscales. Conclusions: Findings suggest that augmenting ERP with ACT enhances change in beliefs about the need to control thoughts, but not in beliefs about responsibility and the importance of thoughts. Clinical implications and future research directions will be discussed.

Keywords: obsessive-compulsive disorder; intrusive thoughts; acceptance and commitment therapy; exposure with response prevention

Different Psychological Processes in Traditional and ACT-Enhanced ERP for OCD

Obsessive-compulsive disorder (OCD) is among the most common and functionally impairing psychological conditions, with a lifetime prevalence of up to 3% in the general population (Adam et al., 2012; Ruscio et al., 2010). Numerous studies support the efficacy and effectiveness of treatment by exposure and response prevention (ERP) (e.g., Olatunji et al., 2013). ERP involves repeated confrontation with obsessional cues (e.g., restroom floors) without the use of compulsive rituals to reduce anxiety (e.g., handwashing). Although ERP is more effective than other psychological interventions and medication for OCD (Fisher & Wells, 2005; Foa et al., 2005), about 50% of individuals continue to experience significant impairment even after a full course of treatment (Loerinc et al., 2015; Springer et al., 2018). Accordingly, it is important to better understand the changes in psychological processes that occur during ERP to improve the effectiveness of the intervention for those who do not respond satisfactorily.

One potential avenue for optimizing ERP is to integrate it with acceptance and commitment therapy (ACT; Hayes et al., 1999), an intervention derived from Relational Frame Theory (RFT; Hayes et al., 2001) and the philosophical tradition of functional contextualism. Like ERP, ACT is a problem-focused, intervention that encourages engagement with feared stimuli without the use of anxiety reduction strategies. Despite these similarities, the mechanisms of change posited to underlie each intervention are distinct. Specifically, ERP is thought to extinguish obsessional anxiety through fear habituation and the modification of dysfunctional cognitions (Benito & Walther, 2015; Foa et al., 2006), whereas ACT is thought to work by changing one’s relationship to obsessions and anxiety and increasing their willingness to engage in valued living despite the occurrence of these unwanted experiences (Twohig, 2009; Twohig et al., 2015). Research has shown initial support for the use of ACT with OCD (Bluett et al., 2014), and participants in a randomized trial of ACT for OCD found the treatment to be highly acceptable with very low drop-out or treatment refusal rates (Twohig et al., 2010).

In a randomized controlled trial, Twohig and colleagues (2018) compared traditional ERP with an ERP program conducted within an ACT framework with no explicit emphasis on habituation or changes in dysfunctional cognitions that result from confronting feared stimuli (ACT+ERP). 58 participants were randomized to condition; nine participants were lost to post (four in ERP and five in ACT+ERP) and 10 participants completed fewer than half of the scheduled treatment sessions (five in ERP and five in ACT+ERP). An additional six participants dropped out of the study prior to the initiation of treatment. These authors found no between-group differences on any OCD severity measure at post-treatment or 6-month follow-up. One way to interpret these findings is that despite their distinct theoretical underpinnings and differences in treatment rationale and delivery, ERP and ACT+ERP operated via a similar mechanism. Alternatively, it is possible that these two interventions worked via their stated mechanisms (as described above) which, although different, one way or another led to similar levels of symptom reduction. In the present study, we aimed to more closely examine the processes that occurred during ERP and ACT+ERP to distinguish shared and unique mechanisms of therapeutic change in order to inform future research on optimizing OCD treatment.

One notable difference between ERP and ACT+ERP is the way in which each intervention conceptualizes obsessional thoughts. Traditional ERP, based on emotional processing theory (EPT; Foa, Huppert, & Cahill, 2006), views obsessions as resulting from fear conditioning in which the affected individual learns to regard normally occurring intrusive thoughts as personally significant or as indicating inflated responsibility for causing or preventing harm (Rachman, 1998; Salkovskis, 1999; Mineka & Zinbarg, 2006). The goal of ERP, according to this theoretical framework, is to reduce obsessional fear via extinction through confrontation with obsessional cues without performing compulsive rituals. For example, an individual who fears that they will cause harm to a loved one if they do not suppress violent, intrusive thoughts, would be encouraged to verbalize, record, and write down such thoughts to learn that the anxiety does not endure indefinitely, and that thought suppression or other compulsive rituals are not necessary to reduce anxiety or prevent disastrous consequences. Such extinction is believed to occur via changes in beliefs about the fear stimulus (e.g., Hofmann, 2008), although ERP from an EPT perspective does not explicitly target such beliefs.

By comparison, ACT+ERP conceptualizes obsessions as arising from experiential avoidance—the tendency to try to control or suppress unwanted thoughts and emotions (e.g., Twohig et al., 2006). From this perspective, OCD treatment provides opportunities to practice defusion (i.e., learning to see intrusive thoughts as meaningless mental noise) and increase psychological flexibility by engaging with unwanted inner experiences and pursing valued activities without using compulsive rituals or other anxiety-reduction strategies. An individual would be encouraged to *observe* their intrusive thoughts about violence and fear that they will cause harm to a loved one and learn to engage with valued activities without taking action to suppress the thoughts and decrease the fear.

The Interpretations of Intrusions Inventory (III; Obsessive Compulsive Cognitions Working Group, 1997, 2001) measures cognitive constructs central to the proposed processes of change for both traditional ERP and ACT+ERP, and therefore affords the opportunity to examine whether these interventions exact differential influences on such processes. Specifically, the III contains three subscales pertaining to: (a) the need to control unwanted thoughts, (b) beliefs that such thoughts are significant and personally meaningful, and (c) beliefs that one is responsible for the perceived harmful consequences associated with the thoughts. The III has been associated with functional disability among individuals with OCD (Storch, Abramowitz, & Keeley, 2009), suggesting that changes in this measure are an important indicator of clinically significant change. Indeed, the III has demonstrated sensitivity to treatment with both ERP and cognitive behavioral therapy (CBT) for OCD (Whittal et al., 2005), and changes in the III during CBT for OCD have been associated with improvements in symptoms (Solem et al., 2015).

Although some authors have found that the III is unidimensional (Obsessive Compulsive Cognitions Working Group, 2005), the first two subscales (control and importance of thoughts) represent processes targeted by ACT via psychological flexibility and defusion (Marcks & Woods, 2005, 2007). Thus, perhaps the combination of ACT and ERP is especially effective at promoting change in these particular unhelpful styles of engagement with intrusive thoughts. The second two III subscales (importance of thoughts and responsibility) align well with the emphasis of traditional ERP, which teaches patients to confront their thoughts and learn that they are not significant or directly linked to action (i.e., thought-action fusion).

The present study therefore aimed to examine the effects of traditional ERP and ACT+ERP on the three processes assessed by the III in the treatment trial conducted by Twohig and colleagues (2018). This study builds on findings reported in Ong and colleagues (2020) regarding changes in the III across treatment sessions of the parent trial (Twohig et al., 2018). Ong and colleagues found that III total scores at baseline predicted differential treatment response over time between conditions, such that for participants with the lowest baseline III scores, OCD severity showed greater variability over the course of treatment in the ACT + ERP. By comparison, OCD severity reliably decreased in the ERP group, regardless of baseline III scores. These findings suggest that the III may be an important change process when comparing ACT+ERP to traditional ERP and set the stage for future research examining changes in III subscales between treatments.

Accordingly, we hypothesized that (a) both interventions would lead to changes in beliefs about the need to control thoughts, the importance of thoughts, and inflated responsibility at both post-treatment and follow-up, (b) changes in beliefs about the need to control thoughts would be greater in the ACT+ERP group relative to the traditional ERP group, and (c) changes in inflated responsibility would be greater in the traditional ERP group relative to the ACT+ERP group.

**Method**

**Participants**

Forty-eight adults between the ages of 18 and 56 (*M* = 26.98, *SD* = 8.01) completed a 16-session trial of either traditional ERP or ACT+ERP for OCD and the assessment measures detailed in the following section (Twohig et al., 2018). 64.6% of participants (*n* = 31) identified as female and 35.4% (*n* = 17) identified as male. All participants received a DSM-IV diagnosis of OCD according to the Mini International Neuropsychiatric Interview 5.0 (MINI 5.0). The sample was 79% (*n* = 38) White, 6% (*n* = 3) Hispanic, 4% (*n* = 2) African American, 2% (*n* = 1) Asian American, 2% (*n* = 1) Native American, 2% (*n* = 1) other, and 4% (*n* = 2) unknown. Approximately 25% of the sample (*n* = 12) met criteria for a co-occurring anxiety disorder, and 31% of the sample (*n* = 15) met criteria for a mood disorder. Half of the sample reported taking psychotropic medication during treatment (*n* = 24) which was admissible in the parent trial as long as doses remained stable from at least one month before starting treatment through study completion. Of the participants using medication, the majority reported taking selective serotonin reuptake inhibitors (*n* = 13). Participants were also not receiving other psychotherapy (or stabilized if receiving non-psychotherapy (e.g., college mindfulness classes) and did not endorse a previous trial of formal ERP or ACT for OCD. Additional exclusion criteria were: active suicidal ideation, severe depression, current mania, psychosis, or borderline or schizotypal personality disorder.

**Procedure**

**Treatment.** As part of the parent trial, participants completed 16 twice-weekly, 2-hour sessions of individualized treatment at one of two sites and were randomly assigned (at each site) to receive either traditional ERP or ACT+ERP. The number of in-session therapist-supervised exposure trials was equal across both conditions. Treatment was delivered by doctoral level therapists and advanced clinical psychology doctoral students who received training in the treatment protocols, adhered to detailed treatment manuals, and received supervision from doctoral-level clinical psychologists with expertise in the treatment of OCD. All study therapists had at least two years of clinical experience and received supervised training in delivering ACT and ERP for OCD (Twohig et al., 2018). All therapists treated at least one participant in each condition. All study therapists were supervised by doctoral-level clinical psychologists with extensive experience in the treatment of OCD. All sessions were videotaped, and individual supervision occurred after each treatment session either in person or via Skype. Each supervisor also treated one client in each condition early in the study.

Sessions 1-2 in both treatment conditions included information gathering, psychoeducation, and treatment planning. Sessions 3-16 involved exposure exercises with instructions to practice exposures out-of-session (“homework”) and refrain from rituals. Homework exposure was given following each exposure session and usually involved repetition of that day’s exposure independently and in different settings. Session 16 also addressed treatment termination and relapse prevention. The centerpiece of both treatment conditions was ERP; and in the ACT+ERP condition, metaphors drawn from ACT were included before, during and after each exposure trial to reinforce the concepts central to this approach (e.g., acceptance of obsessional thoughts and the importance of ERP to one’s values). Daily exposure homework assignments were prescribed for practice between sessions, and patients were instructed to refrain from compulsive rituals between sessions.

In the ERP condition, treatment was delivered in accordance with established exposure-based treatment for OCD (Foa & Kozak, 2004). The treatment rationale emphasized that (a) exposure weakens the connection between obsessional cues and anxiety (via habituation) and response prevention weakens the connection between rituals and anxiety-reduction, and (b) ERP corrects overestimates of the dangerousness of obsessional stimuli. Exposure hierarchies and response prevention plans were developed accordingly, and participants were taught to monitor their subjective anxiety during exposure trials and observe habituation of anxiety within and between trials.

The treatment manual for the ACT+ERP condition was developed for the parent trial and described in detail in Twohig and colleagues (2015). The treatment rationale emphasized that exposures offer opportunities to practice psychological flexibility. Exposure hierarchies and response prevention plans focused on learning flexible responding in the presence of obsessions, anxiety, and urges to ritualize. Exposure practices emphasized acceptance of obsessions and anxiety when they occur, rather than habituation/elimination of fear. For example, clients in the ACT+ERP condition practiced noticing their obsessions as if they were leaves floating by on a stream during exposure. Instead of monitoring anxiety during an exposure exercise, participants tracked their willingness to experience anxiety. Homework exposure practice was linked to the participant’s goals for value-based living.

To examine whether or not the two treatment conditions could be reliably differentiated, 20% of the tapes of session 8 (an exposure therapy session in both conditions) were randomly chosen and viewed by raters familiar with the treatment manuals and blind to treatment condition. These raters were 100% accurate in determining whether the session they watched was drawn from the ERP or ACT+ERP condition, suggesting reliable differentiation between treatment protocols. For more detailed treatment and fidelity protocols, see Twohig and colleagues (2018).

All authors have abided by the Ethical Principles of Psychologists and Code of Conduct as set out by the BABCP and BPS. The Institutional Review Board at each university approved all study procedures; participants and participant data were treated in accord with the American Psychological Association Ethics Code.

**Measures**

**Mini International Neuropsychiatric Interview 5.0 (MINI 5.0; Sheehan et al., 1998).** The MINI 5.0 was administered by a trained assessor to establish a diagnosis of OCD according to DSM-IV criteria. The MINI has demonstrated adequate validity, inter-rater reliability, and retest reliability (Sheehan et al., 1997; Sheehan et al., 1998).

**Yale-Brown Obsessive Compulsive Scale (YBOCS; Goodman, Price, Rasmussen, Mazure, Delgado, et al., 1989; Goodman, Price, Rasmussen, Mazure, Fleischmann, et al., 1989).** OCD symptom severity was assessed using the YBOCS, a semi-structured interview that includes a symptom checklist and 10-item severity scale. The checklist is first used to identify the participant’s particular obsessions and compulsions. The severity scale then assesses the main obsessions (items 1-5) and compulsions (items 6-10) on the following five parameters: (a) time, (b) interference, (c) distress, (d) resistance, and (e) degree of control. The clinician rates each item from 0 (no symptoms) to 4 (extreme) based on the past week. The 10 items are summed to produce a total severity score that ranges from 0 to 40. The YBOCS is the most widely used measure of global OCD severity and has demonstrated adequate reliability, validity, and sensitivity to changes in OCD symptom severity (Goodman, Price, Rasmussen, Mazure, Delgado, et al., 1989; Goodman, Price, Rasmussen, Mazure, Fleischmann, et al., 1989).

**Interpretation of Intrusions Inventory (III; Obsessive Compulsive Cognitions Working Group, 1997, 2001).** The III is a 31-item scale that assesses appraisals or interpretations of intrusive thoughts, images, or impulses. Respondents are provided with a definition of unwanted intrusions and illustrative example, and are prompted to write two intrusive thoughts, images or impulses that they experienced recently. They record the recency, frequency, and distress associated with these intrusions. Respondents then rate 31 statements as they pertain to intrusive thoughts like those recorded on the questionnaire using a scale from 0 (“I did not believe this idea at all”) to 100 (“I was completely convinced this idea was true”); total scores range from 0 to 3100. The III comprises three subscales: (a) importance of thoughts (b) control of thoughts and (c) responsibility. The instrument has demonstrated good validity, internal consistency, and reliability (Obsessive Compulsive Cognitions Working Group, 2005). Test-retest reliability alphas for each subscale were as follows: Importance of thoughts = 0.81, Control of thoughts = 0.83, Responsibility = 0.68. Regarding correlations between III subscales and subscales of the Obsessive Beliefs Questionnaire (OBQ; Obsessive Compulsive Cognitions Working Group, 2001) the strongest correlations were between matched subscales of Control of Thoughts (0.84) and Importance of Thoughts subscales (0.79). The Responsibility subscale of the III was correlated with the OBQ Responsibility subscale (0.66) and the OBQ Control of Thoughts and Importance of Thoughts subscales (0.74 and 0.70 respectively). The measure developers posited that this pattern of correlations is due to the narrower, thought-focused definition of responsibility in the III compared to the broader definition of the OBQ. Participants completed the III at pre-treatment, post-treatment, and follow-up.

**Data analytic strategy**

SPSS statistical software was used to compute descriptive statistics for all variables. A series of 2 (condition) x 3 (time: pre-treatment, post-treatment, follow-up) ANOVAs were performed to examine group differences in changes in III total score and each subscale.

**Results**

**Group Means and Comparisons**

Both groups demonstrated substantial improvement in OCD symptoms, with no significant between-group differences. Overall mean scores on the Y-BOCS fell from 25.06 (*SD*=4.19) at pre-treatment to 11.17 (*SD*=4.90) at post-treatment, and 11.50 (*SD*=6.87) at follow-up. As reported in Twohig et al. (2018), the pre-treatment, post-treatment, and follow-up scores on the YBOCS indicate substantial reductions in OCD symptoms at post-treatment that were maintained at follow-up.

Table 1 shows the mean scores for both groups on the III subscales at pre-treatment, post-treatment, and follow-up. There were no significant group differences on any measure at pre-treatment (all *p*’s > .05).

Table 2 shows the sociodemographic characteristics of the two groups. A series of t-tests

and chi-square tests (also presented in Table 2) failed to detect any significant group differences, suggesting successful randomization. There were no between-group differences in co-occurring clinical diagnoses or in the proportion of participants using psychotropic medication.

**Changes in Process Variables**

**III total score.** A 2 (condition) x 3 (time: pre-treatment, post-treatment, follow-up) ANOVA revealed a significant main effect of time on the III total score, *F*(2,82) = 26.40, *p* < .001, ηp2 = .39, but no main effect of condition, *F*(1,41) = 2.85, *p* = .10, ηp2 = .07or condition by time interaction, *F*(2,82) = 2.45, *p* = .09, ηp2 = .06.

**Control of thoughts.** A 2 (condition) x 3 (time: pre-treatment, post-treatment, follow-up) ANOVA revealed a significant main effect of time on the III control of thoughts subscale *F*(2,76) = 47.49, *p* < .001, ηp2 = .55 but no main effect of condition, *F*(1,38) = 1.48, *p* = .23, ηp2 = .038. The time by condition interaction, however, was significant, *F*(2,76) = 3.42, *p* = .04, ηp2 = .08, such that on average, individuals in the ACT+ERP condition showed greater changes in beliefs about the need to control thoughts, relative to those in the traditional ERP condition (See Figure 1). Follow up 2X2 ANOVAS revealed that this condition by time interaction was significant from pre-treatment to post-treatment, *F*(1,43) = 4.52, *p* < .05, ηp2 = .10, and from pre-treatment to follow-up, *F*(1,38) = 4.30, *p* < .05, ηp2 = .10.

**Importance of thoughts.** A 2 (condition) x 3 (time: pre-treatment, post-treatment, follow-up) ANOVA revealed a significant main effect of time on the III importance of thoughts subscale, *F*(2,76) = 40.65, *p* < .001, ηp2 = .52, but no main effect of condition, *F*(1,38) = .99, *p* = .33, ηp2 = .03or condition by time interaction, *F*(2,76) = 2.35, *p* = .10, ηp2 = .06. Thus, significant changes in perceptions of the importance of obsessional thoughts occurred in both groups, but there were no between-group differences.

**Responsibility.** A 2 (condition) x 3 (time: pre-treatment, post-treatment, follow-up) ANOVA revealed a significant main effect of time on the III responsibility subscale, *F*(2,76) = 52.62, *p* < .001, ηp2 = .58, but no main effect of condition, *F*(1,38) = 2.51, *p* = .12, ηp2 = .06, or time by condition interaction, *F*(2,76) = 2.08, *p* = .13, ηp2 = .05. Thus, significant reductions in responsibility associated with obsessional thoughts occurred in both groups, but there were no between-group differences.

**Discussion**

The present study aimed to examine the effects of traditional ERP and ACT+ERP on cognitive processes of change thought to be associated with these interventions. In support of our first hypothesis, all three process variables—beliefs about the importance of thoughts, need to control thoughts, and inflated responsibility—changed over the course of treatment in both conditions, and remained changed for at least six months after the end of therapy. These findings parallel those of Whittal and colleagues (2005), who found that interpretations of intrusive thoughts decreased over the course of both ERP and CBT. Given that ERP is associated with changes in dysfunctional beliefs even when cognitions are not explicitly targeted (e.g., McLean et al., 2001), it is not surprising that participants developed more adaptive relationships with unwanted thoughts over the course of treatment.

Our second hypothesis that ACT+ERP would produce greater changes in beliefs about the need to control thoughts relative to standard ERP was also supported. This finding is consistent with theoretical differences between ACT and ERP. ACT emphasizes living in accordance with one’s values without attempting to control thoughts, and teaches patients to welcome unwanted obsessional thoughts, images, doubts, and anxiety instead of resisting them. Whereas traditional ERP fosters changes in beliefs about obsessions, ACT explicitly encourages psychological flexibility (i.e., acceptance and openness to obsessions for as long as they occur) through the use of metaphors—(Twohig et al., 2015). For example, the “passengers on the bus” exercise (Hayes et al., 1999) describes the patient as the driver of a bus moving towards their values. Passengers (i.e., obsessional thoughts) yell at the patient and tell her where to go, and it is the patient’s job to go where she wants with intrusive thoughts “coming along for the ride.” ERP from an ACT perspective frames exposures as opportunities to practice “driving the bus” (Twohig et al., 2015) even when the passengers are unwanted and distressing. Still, the III was developed to measure constructs that are relevant in traditional ERP, so it is notable that a difference was detected between treatment approaches.

Our third hypothesis, however, was not supported. Contrary to our prediction that changes in inflated responsibility would be greater in the traditional ERP group relative to the ACT+ERP group, no significant interaction was found. Perhaps even without an explicit focus on inflated responsibility, exposure exercises, which were central components of both treatment conditions, helped participants learn that their obsessional thoughts do not predict culpability for causing or preventing harmful consequences. It is also possible that, as suggested by some authors (e.g., Myers et al., 2009), cognitions related to inflated responsibility are better explained by beliefs about the importance of thoughts (i.e., thought-fusion), which were addressed by both treatment conditions in the present study.

To this end, our finding of no group by time interaction for beliefs about the importance of thoughts suggests that traditional ERP and ACT+ERP are similarly effective strategies for helping individuals with OCD think differently about the significance of their obsessional thoughts, even though this change likely occurs in different ways. Through its emphasis on defusion, a process by which patients change how they relate to their inner experiences, ACT+ERP may implicitly target beliefs about the importance of thoughts. Traditional ERP, on the other hand, more explicitly targets such beliefs through exposure trials that behaviorally disconfirm faulty cognitions about the significance and consequences of obsessional thoughts. It is particularly interesting that the interaction was not significant for the importance of thoughts scale, given that the ERP condition did not explicitly target cognitions or address the importance of thoughts.

Findings from this study have implications for our understanding of OCD treatment. Specifically, our data suggest that interpretations of intrusive thoughts change over the course of both ERP an ACT+ERP, even when cognitions are not explicitly targeted by the clinician. It is especially interesting that ACT+ERP differed from traditional ERP with regard to the need to control thoughts in the context of a trial that showed no main outcome differences. That is, the process of changing one’s beliefs about the need to control thoughts did not reflect overall changes in OCD symptoms. Future prospective research is needed to examine patient-specific characteristics that indicate the use of ACT+ERP relative to traditional ERP for OCD, as well as additional processes that are differentially impacted by ACT and ERP. For example, our study did not measure intolerance of uncertainty, which has been associated with OCD symptom severity (e.g., Tolin et al., 2003). Acceptance techniques may promote tolerance of uncertainty more effectively than ERP alone.

Of note, the current study compared two theoretical approaches to ERP for OCD—EPT and relational frame theory. Craske and colleagues (2008) highlighted limitations of EPT and proposed that inhibitory learning theory better explains the fear extinction process during exposure therapy. Although some promising empirical findings have emerged with regard to the clinical utility of inhibitory learning theory, evidence to date does not yet support the abandonment of EPT when delivering exposure therapy (see Jacoby & Abramowitz, 2016). Thus, the current findings suggesting some advantages of ACT+ERP relative to ERP (with an emphasis on habituation) have important implications for mechanistic differences between approaches and clinical practice. Given the considerable overlap between inhibitory learning theory and ACT-based approaches to exposure therapy (e.g., de-emphasizing fear habituation; accepting/tolerating versus changing emotion), future research is needed to identify the most efficacious elements of each approach to exposure therapy.

Our findings and conclusions should also be considered in light of that fact that our data were collected within the context of a randomized controlled trial and several design decisions necessarily prioritized internal over external validity, as is typical of such investigations. For example, individuals who had severe co-occurring disorders or previous experience with cognitive-behavioral treatments of OCD were excluded from participating, therapists used detailed treatment manuals, and every case was supervised by a licensed clinical psychologist with expertise in the treatment of OCD. These conditions likely do not reflect the level of diagnostic heterogeneity or treatment delivery in typical service settings. Study participants were overwhelmingly white, young, and had at least some college education, which are unfortunately overrepresented groups in psychotherapy research. Future studies testing both treatments with a more diverse sample is needed, as is the use of culturally adapted treatments. Additionally, as mentioned previously, the current study did not directly examine clinical applications of inhibitory learning theory. Thus, the advantage of ACT-ERP in shifting beliefs about the need to control thoughts may not be unique to this approach and should be interpreted relative to ERP from an EPT perspective. Future research comparing ACT+ERP to ERP from an inhibitory learning theory framework, as well as to behavioral experiments combined with cognitive therapy for OCD, would clarify the relative benefits of each approach.

Nevertheless, the present study adds to the literature on changes in psychological processes that occur during OCD treatment and builds on findings reported in Ong and colleagues (2020). Given growing empirical support for the effectiveness of ACT for OCD, additional research is warranted to identify the processes that are best targeted with ACT, ERP, or a combination of these interventions. Given the important clinical implications of research examining modifiable mechanisms of change, future work in this area has the potential to lead to better outcomes for individuals with OCD.

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