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Empirical research

# Randomized controlled trial of acceptance and commitment therapy versus traditional cognitive behavior therapy for social anxiety disorder: Symptomatic and behavioral outcomes☆

James D. Herbert[1,*], Evan M. Forman, Joanna L. Kaye, Marina Gershkovich[2], Elizabeth Goetter[3], Erica K. Yuen[4], Lisa Glassman[5], Stephanie Goldstein, Peter Hitchcock, Jena Shaw Tronieri[6], Staci Berkowitz[6], Stephanie Marando-Blanck[7]

*Department of Psychology, Drexel University, 3141 Chestnut Street, Philadelphia, PA 10103, USA*

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ABSTRACT

Only two trials have compared acceptance and commitment therapy (ACT) and traditional cognitive behavior therapy (tCBT) in the treatment of social anxiety disorder (SAD), with both finding no significant differences. These trials did not examine effects on observer-rated behavioral outcomes and did not explicitly quantify the dose of exposure therapy within each treatment. In a replication trial, one hundred and two individuals with SAD (per DSM-IV criteria) were randomized to 12 sessions of ACT ($n$ = 49) or tCBT ($n$ = 53) controlling for exposure dose and assessing behavioral outcomes. Assessments were completed at pre- and post-treatment using clinician-rated and self-report measures of social anxiety, quality of life, and overall functioning. Observer-rated behavioral measures of social performance were completed for a subsample of participants. Results indicated that participants across conditions received equivalent doses of exposure. Those who received tCBT evidenced greater improvements in self-reported social anxiety symptoms and overall functioning, which contrasts with prior studies finding no differences between tCBT and ACT in the treatment of social anxiety. Medium effect sizes, while not statistically significant, indicate that ACT participants may have had greater improvements in observer-rated social behavior than tCBT participants. The discrepancy between these symptom and behavioral outcomes, building upon prior literature, calls for more research to assess the differences between tCBT and ACT treatments in behavioral domains.

Social anxiety disorder (SAD) is a common psychological condition, with a lifetime prevalence estimated at 12.1% (Kessler et al., 2005). SAD is associated with reduced quality of life and functional impairments across multiple domains (Fehm, Beesdo, Jacobi, & Fiedler, 2008; Lochner et al., 2003). Effective psychosocial treatments for SAD have been developed. The psychotherapeutic intervention that has accrued the greatest scientific support is traditional cognitive behavior therapy (tCBT).[8] tCBT for SAD typically integrates cognitive restructuring and behavioral experiments with exposure exercises, with the explicit goal of reducing subjective anxiety in social situations. Although effective

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* Correspondence to: Office of the President, University of New England, 11 Hills Beach Road, Biddeford, ME 04005, United States.
*E-mail address:* jherbert1@une.edu (J.D. Herbert).
[1] James D. Herbert is now at the University of New England.
[2] Marina Gershkovich is now at Columbia University.
[3] Elizabeth Goetter is now at Massachusetts General Hospital.
[4] Erica Yuen is now at The University of Tampa.
[5] Lisa Glassman is now at the VA San Diego Healthcare System.
[6] Jena Shaw Tronieri and Staci Berkowitz are now at the University of Pennsylvania.
[7] Stephanie Marando-Blanck is now at the University of Massachusetts Boston.

[8] Several authors have argued that the term "CBT" describes a family of interventions that includes various treatment models, including those compared in this study (Arch et al., 2012; Block-Lerner, Wulfert, & Moses, 2009; Herbert & Forman, 2011; Hofmann, Sawyer, & Fang, 2010). We therefore use the convention of referring to the treatment condition based on the work of Beck, Heimberg, and others as "traditional" CBT to distinguish it from the other CBT model described below.

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for many patients (Heimberg, 2002; Mayo-Wilson et al., 2014), many others nevertheless show poor or suboptimal response to tCBT (Rodebaugh, Holaway, & Heimberg, 2004), highlighting the need for alternative interventions. Additionally, behavioral outcomes (i.e., actual social performance) following treatment with tCBT have not been well-documented.

An alternative to tCBT is a family of cognitive-behavioral interventions that emphasizes mindfulness and psychological acceptance rather than cognitive restructuring and behavioral experiments (Herbert & Forman, 2011). Of these acceptance-based therapies, the model that has received the most scientific support to date is acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 2012). ACT emphasizes mindful awareness of one's present-moment experience, cognitive defusion (i.e., creating distance from one's thoughts), nonjudgmental acceptance of the full range of one's psychological experience, and clarification of one's broad life values, all in support of goal-directed behavior change. Accordingly, ACT aims primarily to improve functioning and quality of life rather than to reduce symptoms.

Several clinical innovators have developed ACT-based treatment protocols for SAD, and several studies offer preliminary support to the efficacy of these programs (Craske et al., 2014; Dalrymple & Herbert, 2007; Kocovski, Fleming, Hawley, Huta, & Antony, 2013; Yuen et al., 2013). Two trials have directly compared acceptance-based treatments to tCBT for SAD. Kocovski et al. (2013) compared a mindfulness and acceptance-based group therapy (MAGT), which is similar to and inspired by ACT, to cognitive behavioral group therapy (CBGT) and to a waitlist control for SAD. Craske et al. (2014) compared ACT to tCBT for SAD delivered in an individual format. Both studies found that ACT and tCBT were effective, but did not differ on social anxiety outcomes. Given the high prevalence of and morbidity associated with SAD, replication of clinical trials comparing ACT and tCBT for SAD is needed.

Additionally, neither of these prior trials assessed the treatments' potential impact in the key domain of *behavioral performance* (Hayes et al., 2012). The well-documented behavioral impairments associated with SAD (i.e., poor social skills and high anxiety during social interactions as rated by observers; Baker & Edelmann, 2002; Norton & Hope, 2001; Stopa & Clark, 1993) underscore the importance of directly assessing social behavior in clinical trials. ACT emphasizes goal-directed behavior change irrespective of immediate subjective distress, and may therefore be predicted to yield greater improvements on behavioral outcomes (Brown et al., 2011; Glassman et al., 2016; Wagener & Zettle, 2011).

It is well established that self-report and independent observer ratings of behavioral performance often differ among socially anxious individuals (Herbert et al., 2005; Norton & Hope, 2001; Rapee & Lim, 1992). In addition, research has found discrepancies between self-report and behavioral measures in comparisons of acceptance-based therapies and tCBT interventions (Brown et al., 2011; Glassman et al., 2016; Wagener & Zettle, 2011). These studies tend to find that acceptance-based treatments produce greater improvements in behavioral performance, despite resulting in similar or more modest improvements in subjective distress. In a trial of ACT versus tCBT for public speaking anxiety, participants in the ACT condition exhibited greater observer-rated performance in an impromptu speech task but less improvement in self-reported anxiety (Glassman et al., 2016). Brown et al. (2011) found that students with test anxiety who completed an ACT-based workshop achieved greater improvements in scores on a classroom exam compared to participants who completed a tCBT workshop, despite participants in the tCBT group reporting greater reductions in subjective anxiety. In an analogue study of spider phobia, participants were led to believe that they were moving progressively closer to a spider during an approach task; participants who received an ACT-based intervention progressed further and were more willing to repeat the procedure than participants who received a tCBT intervention, whereas both groups reported similar levels of subjective distress (Wagener & Zettle, 2011). Results from these studies suggest that these two psychotherapy models may differentially impact behavioral performance and subjective distress.

A centerpiece of both tCBT and ACT for SAD is behavioral exposure to feared situations (Ruiz, 2012). In fact, exposure is so central to behavioral treatments for SAD that psychotherapy models like tCBT and ACT are sometimes conceptualized as alternative frames for facilitating exposure treatment (Bluett, Landy, Twohig, & Arch, 2016). Given its well-established efficacy in the treatment of anxiety disorders, it is important to ensure that the dose of exposure is similar across conditions in trials comparing behavioral treatments for SAD. Otherwise, any differences that emerge might be attributable merely to differences in doses of exposure. Although previous trials controlled for the number of *sessions* that included exposures (Craske et al., 2014; Kocovski et al., 2013), they did not directly measure the actual quantity of time participants spent conducting exposures, making it impossible to ensure an equal dose. In the present study, we directly compared the number of minutes participants in each treatment spent engaged in within-session exposures in order to control for the dose of exposure across conditions.

In summary, the current study sought to replicate and extend the literature comparing ACT and tCBT programs for SAD by controlling for exposure dose and examining treatment effects using multimodal assessments that included self-report, clinician-administered, and behavioral performance measures. We hypothesized that ACT and tCBT would both result in large improvements on self-report and clinician-administered measures, and that ACT would demonstrate greater improvement in behavioral performance.

## 1. Method

### 1.1. Participants

Eighty-eight participants who provided informed consent and met DSM-IV-TR criteria for a primary diagnosis of SAD were randomized by the research coordinator to receive ACT ($n$ = 49) or tCBT ($n$ = 53). Participants who received at least one session of treatment ($n$ = 88) were included in intent-to-treat (ITT) analyses. The ITT sample was 51.14% female and racially diverse (see Table 1). The mean age was 29.97 years ($SD$ = 10.98). Participants who reported currently taking psychiatric medication (18%) were kept on a stable dosage for at least 4 weeks before their first session and agreed to maintain their dosage throughout treatment. All study visits took place at Drexel University. See Fig. 1 for a CONSORT diagram.

### 1.2. Diagnostic assessment procedure

Interested participants completed a phone screen with research staff. Those who appeared to meet inclusion criteria were invited to an in-person screening interview, in which trained diagnosticians administered the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-IV; First, Spitzer, Gibbon, & Williams, 2002) and the social anxiety section of the Anxiety Disorders Interview Schedule-IV (ADIS-IV; Brown, DiNardo, & Barlow, 1994). Diagnosticians were clinical psychology graduate students who received extensive training in administration of the instruments. Diagnoses were confirmed through a review of assessment data by the first or second author, both licensed clinical psychologists.

Participants were included in the study if they met criteria for the generalized subtype of SAD per DSM-IV criteria (American Psychiatric Association, 1994), were aged 18–65, and had working fluency in English. Exclusion criteria included: pervasive developmental disability; acute suicide potential, which was assessed via a clinical interview that determined the frequency and intensity of suicidal ideation, the presence of suicidal intent, and the development of a specific suicidal plan; inability to travel to the treatment site; comorbid diagnosis of a psychotic disorder or current substance dependence. To enhance external validity, comorbid diagnoses of mood or anxiety

**Table 1**
Demographic and clinical characteristics of the intent-to-treat sample.

| Characteristic | TOTAL ($N$ = 88) | ACT ($n$ = 48) | tCBT ($n$ = 40) | $t$ or $\chi^2$ | $p$ |
|---|---|---|---|---|---|
| Age | 29.97 (10.98) | 29.90 (11.66) | 30.05 (10.25) | -0.07 | 0.95 |
| Gender (Female) | 51.14% (45/88) | 56.25% (27/48) | 45% (18/40) | 1.11 | 0.29 |
| Ethnicity | | | | 3.12 | 0.53 |
| African American/Black | 14.77% (13/88) | 16.67% (8/48) | 12.5% (5/40) | | |
| White/European American/Caucasian | 48.86% (43/88) | 43.75% (21/48) | 55% (22/40) | | |
| Asian American /Asian/Pacific Islander | 15.91% (14/88) | 20.83% (10/48) | 12.5% (5/40) | | |
| Latino/Latina/Hispanic American | 6.82% (6/88) | 4.17% (2/48) | 10% (4/40) | | |
| Multiracial/Other | 12.5% (11/88) | 14.58% (7/48) | 10% (4/40) | | |
| Current Medication | 18.42% (14/76) | 12.5% (5/40) | 25% (9/36) | 1.97 | 0.16 |
| Employment Status | | | | 7.49 | 0.06 |
| Full-time | 40.96% (34/83) | 27.08% (13/48) | 55.26% (21/38) | | |
| Part-time | 28.92% (24/83) | 35.42% (17/48) | 18.42% (7/38) | | |
| Occasional or per diem | | | | | |
| No income | 4.82% (4/83) | 6.25% (3/48) | 2.63% (1/38) | | |
| | 25% (21/83) | 31.25% (15/48) | 23.68% (9/38) | | |
| Relationship status | | | | 1.99 | 0.37 |
| Married/cohabitating | 26.14% (23/88) | 22.92% (11/48) | 30% (12/40) | | |
| Single | | | | | |
| other | 57.95% (51/88) | 64.55% (31/48) | 50% (20/40) | | |
| | 15.91% (14/88) | 12.5% (6/48) | 20% (8/40) | | |
| Comorbid Mood Disorder | 20.27% (15/74) | 20.51% (8/39) | 20% (7/35) | 0.003 | 0.96 |
| Comorbid Anxiety Disorder | 8.12% (6/74) | 7.69% (3/39) | 11.43% (4/35) | 0.3 | 0.58 |

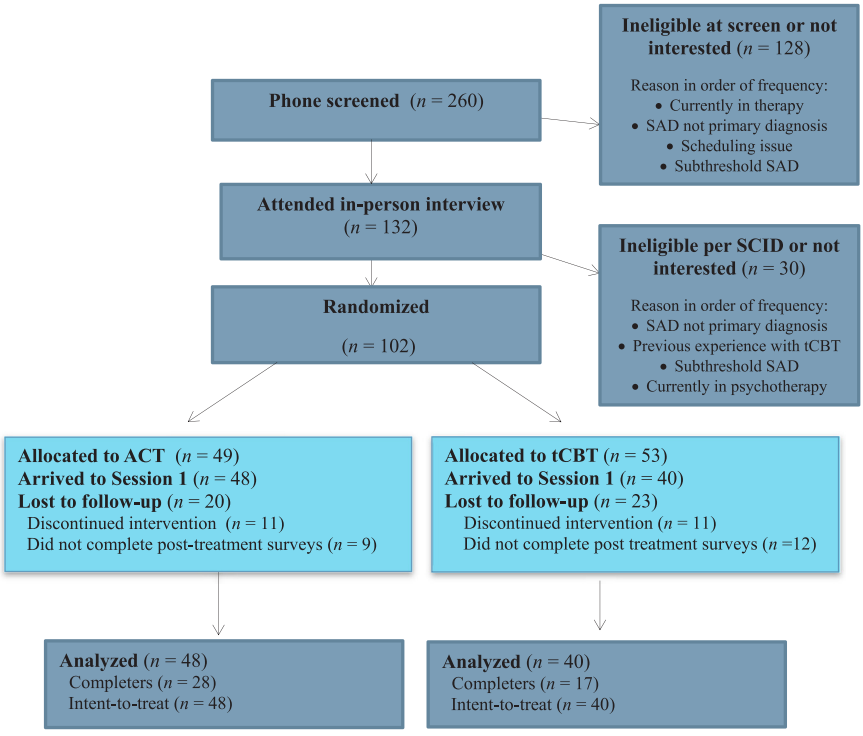


**Fig. 1.** Participant flow.

disorders were not exclusionary if secondary to the diagnosis of SAD. In the case in which a participant met criteria for more than one diagnosis, determination of diagnostic primacy was made on the basis of which diagnosis was associated with the most distress and functional impairment, and which had the earlier onset.

### 1.3. Treatments

Both treatment protocols consisted of 12 individual weekly sessions.[9] The first two sessions were scheduled for 90 min and the remaining sessions for one hour. Both protocols included within-session exposure exercises lasting up to half of each session from sessions 3 through 12. Exposure exercises were chosen from a graded list of feared situations (i.e., fear hierarchy) designed collaboratively between therapists and clients. Exposures included in vivo exposures (e.g., asking a stranger on the street for directions) and simulated exposures (e.g., conversations with confederate role-players). Both protocols emphasized the importance of eliminating safety behaviors and focusing attention outwardly during social interactions to improve social performance. Participants were assigned exposure tasks for homework in sessions 3 through 12.

[9] Treatment manuals are available from the first author upon request.

#### 1.3.1. Traditional cognitive behavioral therapy

The tCBT protocol was a modified version of the 16-session CBT for SAD manual by Ledley, Foa, and Huppert (2005). Session 1 involved psychoeducation and derivation of a personalized model of the participant's social anxiety. The model identified how an individual's distorted cognitions about social situations, enhanced self-focus, use of safety behaviors during social situations, and avoidance of feared social situations functioned to maintain symptoms. Session 2 employed a safety behavior experiment designed to underscore the importance of eliminating safety behaviors and increasing outward-focused attention. Sessions 3 through 12 included review of exposures completed for homework, practice in identifying, labeling, and disputing distorted cognitions, and engaging in exposure exercises. Prior to each exposure exercise, participants were asked to identify the automatic thoughts they expected to arise during the exposure. The therapist guided the participant through a process of identifying cognitive distortions and designing a corresponding rational response. The tCBT frame for the exposures focused on testing the accuracy of the original automatic thoughts and their corresponding rational responses. Session 12 focused on relapse prevention.

#### 1.3.2. Acceptance and commitment therapy

The ACT protocol integrated exposure exercises within an ACT framework and aimed to improve quality of life and functioning rather than reduce anxiety per se (Herbert, Forman, & Dalrymple, 2009). The program used metaphors and experiential exercises to convey key principles. Session 1 introduced the concept of "creative hopelessness" and helped participants recognize the futility of attempts to control distressing thoughts and feelings associated with social anxiety. Session 2 employed an exercise that aimed to explore the effects of safety behaviors and outward-focused attention on one's social performance rather than on one's anxiety, as emphasized in the tCBT condition. The ACT frame for exposures (conducted in Sessions 3 through 12) focused on practicing willingness to experience negative internal experiences (e.g., uncomfortable thoughts, feelings, or bodily sensations) in the service of engaging in behaviors consistent with the individual's values. In Session 4, participants were guided to clarify their personal values and set goals consistent with those values. Session 5 introduced cognitive defusion, in which one creates psychological distance from thoughts by separating oneself from their literal meaning (Hayes, Strosahl, & Wilson, 1999). Session 6 introduced mindfulness as a tool to increase willingness to engage in difficult actions consistent with one's values. Session 7 aimed to reduce attachment to rigid personal narratives (e.g., "I am a shy person"). The relationship between these concepts and engagement in valued action was underscored and tied explicitly to exposure exercises. Sessions 8 through 12 involved continued practice and integration of ACT processes with exposure exercises. Session 12 focused on relapse prevention.

### 1.4. Therapists

Therapists ($n$ = 19) were clinical psychology doctoral or master's students at XXX University. Therapists completed a year-long training program in SAD treatment, supervised by the first and second authors, both licensed clinical psychologists with extensive experience using both tCBT and ACT to treat SAD. Training consisted of didactic lectures, observation of therapy sessions, supervised role-plays, and co-conducting therapy sessions with an advanced clinician. Therapists received weekly supervision with the first and second authors, including feedback through review of therapists' audio recordings of sessions. Therapists treated an approximately equal number of participants in both treatment conditions to limit therapist effects.

### 1.5. Measures

tCBT places greater emphasis on reducing subjective symptoms, whereas ACT emphasizes improvement in psychological flexibility in the service of values-consistent behavior. Accordingly, we chose outcome measures assessing symptoms as well as quality of life, overall functioning, and behavioral performance. Participants underwent assessments at baseline and post-treatment by trained assessors blind to treatment condition.

#### 1.5.1. Primary outcomes

*1.5.1.1. Social anxiety measures.* The social anxiety section of the *ADIS-IV* (Brown et al., 1994) assesses individuals' levels of fear and avoidance from 0 (*no fear and avoidance*) to 8 (*extreme fear and avoidance*) across 13 social situations, yielding Fear and Avoidance subscales in addition to a total score. The *Liebowitz Social Anxiety Scale-Self Report* (LSAS; Fresco et al., 2001; Liebowitz, 1987) assesses individuals' level of fear and avoidance of performance-related and other social situations. Items are rated from 0 (*no fear/never avoid*) to 3 (*severe fear/usually avoid*). The LSAS has strong internal consistency and convergent and discriminant validity. The *Social Phobia and Anxiety Inventory* (SPAI; Turner, Beidel, Dancu, & Stanley, 1989) includes a 32-item Social Phobia subscale (SPAI-SP) that assesses feelings of distress in social situations on a scale from 0 (*never*) to 7 (*always*). Individuals rate levels of anxiety in each situation when it involves different groups (i.e., strangers, authority figures, the opposite sex, and people in general). The SPAI has high test-retest reliability and good internal consistency.

*1.5.1.2. Diagnostic status.* The social anxiety section of the SCID-IV determined diagnostic status at post-treatment.

*1.5.1.3. Clinical severity and improvement.* Trained assessors interviewed participants using the *Clinical Global Impression Severity Scale* (CGI-S) to assess clinical severity, and the *Clinical Global Impression Improvement Scale* (CGI-I) to assess clinical improvement (Guy, 2000).

*1.5.1.4. Behavioral assessment.* A subset of participants ($n$ = 12 for ACT; $n$ = 11 for tCBT) completed a behavioral assessment task (BAT) at baseline and post-treatment. Participants were asked to maintain two, 3-min conversations with confederate actors (a dyadic and a triadic conversation) and to give a brief, 3-min impromptu speech before a small audience. The task was video recorded for subsequent rating by two independent assessors blind to treatment condition and assessment point. Using a 5-point Likert scale (1 = *poor* and 5 = *excellent*), assessors rated social skills on three dimensions: verbal content (e.g., amount of speech during task and degree to which speech was relevant and appropriate), nonverbal skills (e.g., degree of fidgeting and eye contact; appropriateness of gestures and posture), and paralinguistic skills (e.g., appropriateness of tone, enunciation, inflection, and rate). Prior research has employed this behavioral assessment protocol (Glassman et al., 2016; Herbert et al., 2005). Before rating the videotapes, assessors were trained to a criterion reliability greater than 0.80. Calculated inter-rater reliability between the two raters was excellent (*ICC* = 0.97).

*1.5.1.5. Exposure quantity.* Exposure quantity reflects the average time participants engaged in behavioral exposures within each session from sessions 3–12. A random subset of therapy sessions ($n$ = 191) were audio recorded and coded by raters ($n$ = 9) blind to treatment condition. A criterion rater coded 20% of all audio recordings; inter-rater reliability between the criterion rater and the other coders was excellent (*ICC* = 0.97).

#### 1.5.2. Secondary outcomes

The *Quality of Life Inventory* (QOLI; Frisch, 1994) asks respondents to provide ratings of 16 domains based on the importance of that domain to their life from 0 (*not important*) to 2 (*very important*) and their level of satisfaction with that domain from −3 (*very unsatisfied*) to 3

(*very satisfied*). Quality of life is determined by adding the products of each domain's importance and satisfaction ratings. The QOLI has demonstrated good internal validity (Frisch et al., 2005). The *Outcome Questionnaire* (Lambert et al., 1996) is a 45-item measure that assesses functioning and is comprised of three subscales: symptom distress, interpersonal relationships, and social role performance. The measure has demonstrated high reliability and good concurrent and construct validity. The *Beck Anxiety Inventory* (BAI; Beck, Epstein, Brown, & Steer, 1988) is a 21-item measure with high internal consistency and test-retest reliability that assesses the degree to which respondents are bothered by common symptoms of anxiety on a scale from 0 (*not at all*) to 3 (*severely – it bothered me a lot*). The *Beck Depression Inventory-II* (BDI-II; Beck, Steer, & Brown, 1996) is a 21-item measure with high internal consistency that assesses severity of depressive symptoms on an ordinal scale from 0 to 3 (Dozois, Dobson, & Ahnberg, 1998). The *Working Alliance Inventory-Short* (WAI-S; Tracey & Kokotovic, 1989) is a 12-item measure that assesses therapeutic alliance in terms of agreement on the tasks of therapy, agreement on the goals of therapy, and development of an emotional bond. *Therapist allegiance* was determined through surveys completed by the therapists after their participation in the study that asked them to rate on a continuum their overall preference for the ACT versus tCBT protocols. *Treatment satisfaction* was assessed through a 6-item survey that asked participants to use a 5-point scale to rate their level of satisfaction with their treatment, the extent to which the treatment decreased their fears and avoidance of social situations, and their expected symptom severity in the future. *Therapist adherence* was examined through a review of a subset of audiotapes ($n$ = 191) by blinded raters ($n$ = 9) who coded whether they believed the session reflected an ACT or tCBT condition assignment.

### 1.6. Statistical analyses

All statistical analyses were conducted using SPSS v. 24.0. Where descriptive statistics indicated that the presence of outliers affected the normality of data, outliers were trimmed to the nearest non-outlier. Following such transformations, no violations of the assumptions of analysis of variance (ANOVA) were detected. Missing data were handled using multiple imputation (MI) procedures with $m$ = 5 imputations of subscale summary scores for each key measure. Analyses were completed separately for treatment completers and the intent-to-treat sample.

#### 1.6.1. Pre-treatment group differences

Chi-square tests of independence examined differences in categorical variables at baseline by condition. Independent samples $t$-tests assessed treatment differences in age.

#### 1.6.2. Attrition

Chi-square tests examined group differences in treatment attrition.

#### 1.6.3. Primary outcomes

Outcome analyses for social anxiety, behavioral performance, and clinical severity measures were conducted using a 2 (ACT vs. tCBT) by 2 (pre- vs. post-treatment) mixed factorial ANOVA. Due to limited sample sizes and resulting limited statistical power, results are discussed both in terms of statistical significance and magnitude of effect sizes. For any group by time interaction effects that demonstrated statistical significance or medium-or-larger effect sizes, we conducted analyses of simple main effects between groups at each time point. Independent samples $t$-tests examined group differences in clinical improvement (CGI-I). Chi-square tests determined group differences in diagnostic status at post-treatment. Independent samples $t$-tests assessed group differences in exposure quantity per session across the sessions coded by raters.

#### 1.6.4. Secondary outcomes

Group differences in quality of life (QOLI), functioning (OQ-45), anxiety (BAI), and depression (BDI) were examined using a 2 by 2 mixed factorial ANOVA. Independent samples $t$-tests examined group differences in therapist allegiance, treatment satisfaction, and therapeutic alliance (WAI-S). Therapist adherence was determined by the percentage of audio recordings correctly categorized to the appropriate treatment condition. Reliable change was calculated using the reliable change index described by Jacobson and Truax (1991) with the more conservative denominator proposed by Maassen (2004). Clinical significance was defined as achieving both reliable change and a final LSAS score within two standard deviations of the mean in a functional population (total LSAS scores below 38.9 indicated clinical significance; Fresco et al., 2001; Jacobson & Truax, 1991). Treatment differences were assessed via chi-square tests of independence.

## 2. Results

Results indicated that completer and ITT analyses yielded similar patterns of findings and conclusions; thus, we present detailed results from the treatment completer analyses, and note instances in which the ITT analyses yielded a different pattern of results.

### 2.1. Pre-treatment group differences

The between-group comparison of baseline demographic characteristics revealed a trend toward a difference in the distribution of employment status ($p$ = .06; see Table 1). In all analyses, we initially examined employment status as a covariate. Because results indicated that employment status did not affect any outcome variables, it was removed from the final models. For the subset of participants who completed the behavioral assessment, medium-or-larger effect sizes (though not statistical significance) indicated that ACT participants were rated as having poorer social skills at baseline for the dyadic task, though not for the other tasks, and reported higher physiological anxiety (BAI), depression (BDI), and social anxiety (SPAI –SP) at baseline than tCBT participants. There were no statistically significant differences at baseline.

### 2.2. Treatment attrition

Forty-five participants (51%) who began treatment completed the 12-session course of treatment *and* the associated post-treatment assessment, including 57% in the ACT condition ($n$ = 28) and 42.5% in the tCBT condition ($n$ = 17; see Fig. 1). Attrition rates did not differ by condition ($p$ = .14). The proportion of participants who completed a post-treatment assessment did not differ by group ($p$ = .14). An additional 21 participants completed treatment but did not complete the post-treatment assessments (23.86%); this is likely due to the absence of compensation for completion of assessments. The number of participants who completed the treatment portion of the study did not differ by condition ($p$ = .62). Twenty-three participants completed the behavioral assessment ($n$ = 12 in ACT and $n$ = 11 in tCBT).

Significantly more participants allocated to tCBT did not attend the first treatment session ($n$ = 13) compared to ACT ($n$ = 1). tCBT participants who did not attend the first session did not differ demographically from the rest of the sample or from those allocated to tCBT who did attend the first session. Although patients were briefly informed of their condition over the phone, there was no elaboration about the conditions until Session 1. Moreover, recruitment materials for the study referenced “psychotherapy” and did not describe differences between the two treatments. Therefore, while we cannot offer a good explanation for why fewer participants attended Session 1 of tCBT compared to ACT, we have no reason to believe there was anything systematic about this difference.

**Table 2**
Means and standard deviations for primary outcomes by condition for completers sample.

| Dependent Variable | ACT ($n$ = 28) | | tCBT ($n$ = 17) | | Repeated-Measures ANOVA time by condition interaction | | |
|---|---|---|---|---|---|---|---|
| | Pre *M (SD)* | Post *M (SD)* | Pre *M (SD)* | Post *M (SD)* | *F* | *p* | $\eta_p^2$ |
| ADIS Fear[+] | 24.67 (5.07) | 17.84 (5.21) | 25.4 (6.7) | 17.44 (5.82) | 0.35 | 0.56 | 0.01 |
| ADIS Avoidance[+] | 22.1 (5.53) | 12.93 (5.26) | 21.4 (5.8) | 12 (7.96) | 0.01 | 0.91 | < 0.001 |
| ADIS Total[+] | 46.79 (10.15) | 30.7 (9.72) | 46.8 (11.69) | 29.44 (13.47) | 0.12 | 0.73 | 0.002 |
| CGI- Severity[+] | 4.45 (0.68) | 3.29 (0.86) | 4.4 (0.58) | 2.48 (1.23) | 6.14 | 0.02* | 0.1 |
| CGI-Improvement[+] | – | 2.18 (0.77) | – | 1.89 (0.75) | 2.2 | 0.14 | 0.04 |
| LSAS total | 72.54 (17.48) | 54.14 (19.17) | 76.47 (16.05) | 36 (20.07) | 18.25 | < 0.001*** | 0.3 |
| LSAS fear | 39.14 (8.52) | 30.89 (10.49) | 41.76 (7.89) | 22.53 (9.71) | 15.96 | < 0.001*** | 0.27 |
| LSAS avoidance | 33.39 (10.48) | 23.25 (10.49) | 34.71 (10) | 13.47 (12.41) | 14.1 | 0.001** | 0.25 |
| SPAI Social Phobia | 130.17 (17.48) | 103.9 (28.72) | 131.66 (19.63) | 75.47 (27.99) | 14.02 | 0.001** | 0.25 |
| QOLI mean | −0.12 (1.61) | 0.19 (0.143) | 0.01 (1.32) | 0.92 (1.8) | 2.8 | 0.1 | 0.06 |
| OQ−45 Total | 118.36 (25.21) | 105.54 (24.39) | 120.06 (18.4) | 91.34 (24.51) | 6.59 | 0.01* | 0.13 |
| BAI | 14.25 (7.71) | 10.07 (8.31) | 16.29 (9.67) | 6.82 (4.86) | 3.6 | 0.06 | 0.08 |
| BDI-II | 14.14 (9.56) | 11.41 (9.15) | 11.41 (9.15) | 4.94 (7.21) | 0.02 | 0.9 | < 0.001 |
| WAI-S | – | 67.36 (10.24) | – | 72 (6.28) | 2.83 | 0.1 | 0.06 |

*Note.* [+]Sample size for analyses of clinician-rated measures varied due to availability of data ($n$ = 29–33 for ACT; $n$ = 25–27 for CBT). ADIS = Anxiety Disorders Interview Schedule. BAI = Beck Anxiety Inventory. BDI = Beck Depression Inventory. CGI = Clinical Global Impression. LSAS = Liebowitz Social Anxiety Scale. OQ = Outcomes Questionnaire. QOLI = Quality of Life Inventory. SPAI = Social Phobia Anxiety Inventory. WAI-S = Working Alliance Inventory – Short.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

### 2.3. Primary outcomes

Table 2 depicts the means and *SD*s for clinician-rated and self-report measures at pre- and post-treatment by group, as well as the results of the group by time interaction. Consistent with our hypothesis, participants in both groups demonstrated large, statistically significant improvements across symptom measures over time.

#### 2.3.1. Social anxiety measures

Across all self-reported social anxiety measures, results revealed significant group by time interaction effects with large effect sizes ($\eta_p^2$ = .25–0.27; see Fig. 2). Analyses of simple main effects revealed that tCBT participants reported lower symptom severity scores at post-treatment compared to ACT participants (*ps* = 0.002–0.01). The group by time interaction was not significant for the ADIS-IV scales.

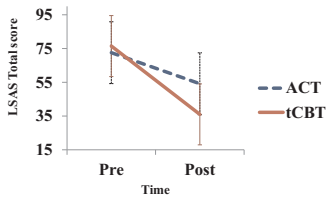


**Fig. 2.** Differences from pre- to post-treatment on the Liebowitz Social Anxiety Scale total score by treatment condition. LSAS = Liebowitz Social Anxiety Scale.

#### 2.3.2. Diagnostic status

A higher proportion of participants in the tCBT condition (65.38%) achieved diagnostic remission than participants in the ACT condition (40.63%), $\chi^2$ (1, $n$ = 58) = 3.52, $p$ = .06, Φ = -0.25.

#### 2.3.3. Clinical severity and improvement

The group by time interaction for CGI-Severity (see Table 2) was significant with a medium effect size, and an analysis of simple main effects revealed that participants in the tCBT condition were rated as less severely ill at post-treatment ($p$ = .01) than participants in the ACT condition. CGI-Improvement scores, however, indicated a lack of effect of condition.

#### 2.3.4. Behavioral Assessment Task

Analyses revealed no demographic or clinical differences at baseline between participants for whom behavioral data were collected and participants for whom behavioral data were not collected (as indicated by *ps* > 0.05 and small effect sizes). This suggests that the subsample of participants with behavioral data is likely to be representative of the treatment sample as a whole. Likewise, within the subset of participants for whom behavioral data were collected ($n$ = 23), there were no demographic differences between participants assigned to the ACT vs tCBT conditions.

Table 3 displays the pre- and post-treatment ratings of the BAT by treatment group, and results of the group by time interaction for each task. Because we were underpowered to detect significant differences between groups for these data, we relied primarily on interpretation of effect sizes. Our hypothesis that participants in the ACT condition would evidence

**Table 3**
Means and standard deviations of behavioral assessment ratings of global social skills for completers sample.

| Dependent Variable | ACT ($n$ = 12) | | tCBT ($n$ = 11) | | Repeated-Measures ANOVA time by condition interaction | | |
|---|---|---|---|---|---|---|---|
| | Pre *M (SD)* | Post *M (SD)* | Pre *M (SD)* | Post *M (SD)* | *F* | *p* | $\eta_p^2$ |
| Dyadic social task | 7.75 (1.42) | 10.50 (1.62) | 9.40 (2.50) | 10.60 (1.90) | 2.63 | 0.12 | 0.12* |
| Triadic social task | 8.83 (1.64) | 10.67 (1.92) | 9.09 (2.55) | 10.27 (2.53) | 0.61 | 0.44 | 0.03 |
| Impromptu speech | 8.42 (2.07) | 10.75 (1.82) | 8.55 (1.69) | 9.64 (2.38) | 2.23 | 0.15 | 0.10* |

*Note.*
* Indicates medium effect size.

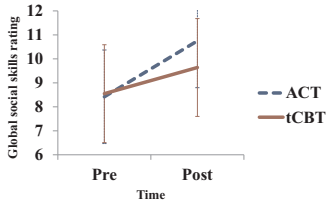


**Fig. 3.** Differences from pre- to post-treatment on observer-rated global social skills during the impromptu speech task by treatment condition.

larger improvements on behavioral performance measures than participants in the tCBT condition was supported via effect size trends, although the results were not statistically significant and must therefore be interpreted with caution. Medium effect sizes indicated that participants in the ACT condition appeared to demonstrate greater improvement in global social skills than participants in the tCBT condition for the dyadic task ($\eta_p^2$ = .12, $p$ = .12) and the speech ($\eta_p^2$ = .10, $p$ = .15; see Fig. 3). Results suggested no differences for the triadic social task.

#### 2.3.5. Exposure quantity

The amount of time participants engaged in within-session exposures in the ACT condition ($M$ = 9.83 min per session, $SD$ = 7.81 min) was not significantly different than in the tCBT condition ($M$ = 8.96 min per session, $SD$ = 8.18 min), $t(189) = 1.01$, $p$ = .32, $d$ = 0.15.

### 2.4. Secondary outcomes

The group by time interaction for quality of life showed a non-significant medium effect size favoring tCBT, and analyses of quality of life in the ITT sample did not suggest group differences. Similarly, the group by time interaction for the OQ-45 demonstrated superiority of tCBT over ACT in the completers but not ITT data.

Group by time interactions for anxiety (BAI) also suggested greater improvement for participants in the tCBT condition compared to those allocated to ACT, though this finding was not maintained in the ITT sample. No group differences emerged for depression (BDI). A medium effect size in analyses of therapeutic alliance (WAI-S) suggests that participants in the tCBT condition tended to report greater alliance than participants in the ACT condition. Post hoc analyses indicated that therapeutic alliance scores across treatments accounted for 23.2% of variance in participants' post-treatment social anxiety scores on the LSAS. However, the interaction effect between time and treatment group on the LSAS remained significant when working alliance scores were included in the model.

Therapist allegiance analyses suggested a trend towards therapists preferring the ACT to the tCBT protocol, $t(19) = 2.02$, $p$ = .06, $d$ = 0.45.

Participants reported high treatment satisfaction across both treatments. There were no significant differences across groups in treatment satisfaction.

When blinded raters coded whether they believed audio recordings reflected ACT or tCBT sessions, only one recording was coded incorrectly, whereas 99.48% of tapes were categorized correctly.

#### 2.4.1. Clinical significance

Among completers, 75% (21/28) of ACT participants and 94% (16/17) of tCBT participants achieved reliable change, with no significant difference by condition. A higher proportion of participants in the tCBT group (9/17, or 53%) achieved clinically significant improvement than in the ACT group (7/28, or 25%; $p$ = .06; $\Phi = -0.28$). In the ITT sample, a similar proportion of both groups achieved reliable change (tCBT: 91%; ACT: 85.83%) and clinically significant improvement (tCBT: 25%; ACT: 15.32%).

## 3. Discussion

A paucity of randomized controlled trials (RCTs) have compared acceptance-based therapies and traditional CBT for SAD. The two RCTs conducted to date did not examine behavioral outcomes and did not directly quantify time spent engaged in exposure exercises across conditions. The goal of the present study was to replicate prior comparative trials of ACT versus tCBT in the treatment of SAD and to address methodological limitations by employing a multimodal assessment strategy that included assessments of behavioral performance while controlling for the dose of exposure in each condition. Consistent with hypotheses, ACT and tCBT resulted in large improvements on self-report and clinician-administered symptom measures. Participants who completed tCBT reported significantly greater improvement in self-reported and clinician-rated symptoms and functioning with large effect sizes. Additionally, a higher proportion of participants in the tCBT group achieved clinically significant improvement than participants in the ACT group. In contrast, consistent with our hypothesis though not statistically significant, medium effect sizes indicated that participants in the ACT condition may have demonstrated greater improvements in behavioral social skills (as rated by blinded observers) relative to those in the tCBT condition. Importantly, results indicated that participants in both groups received equal doses of exposure, suggesting that differential outcomes reflect the effects of treatment-specific components.

Our finding of significantly greater improvement on symptom measures in the tCBT group is inconsistent with prior comparative trials of tCBT and ACT for SAD (Craske et al., 2014; Kocovski et al., 2013) and of tCBT and ACT for mixed anxiety disorders (Arch et al., 2012). These studies found no differences in symptom change between conditions. In the present study, tCBT participants achieved similar post-treatment symptom levels as those in the other two RCTs of SAD, whereas fewer participants in the ACT group achieved clinically significant improvement. The current results are consistent with the long-term outcomes reported in an effectiveness trial of ACT versus tCBT for outpatients with anxiety and depression at a student counseling center (Forman et al., 2012), which also found greater symptom reduction in the tCBT group compared to the ACT group. However, in the study by Forman et al. (2012), effect sizes favoring tCBT were small-to-medium ($\eta_p^2 \leq .04$), and significant differences were not found in anxiety symptoms. In contrast, differences in symptom improvement favoring tCBT in the current study reflected large effect sizes ($\eta_p^2$ = 0.25–0.30 across social anxiety measures). Therefore, these findings suggest notable superiority of tCBT compared to ACT on self-report and clinical interview measures in the treatment of social anxiety.

Interpretation of these findings may be explained in part by the stated goals of each treatment, as these results are also consistent with the lesser emphasis on symptom reduction within ACT's theoretical model. Indeed, our ACT protocol intentionally avoided a focus on symptom reduction. This lack of focus on anxiety reduction may appear counterintuitive to clients who are seeking help due to anxiety-related distress (Kohlenberg, Hayes, & Tsai, 1993); in fact, others have found that tCBT is rated by patients as more credible than ACT for anxiety disorders (Arch et al., 2012; Arch, Twohig, Deacon, Landy, & Bluett, 2015). One strength of tCBT over ACT may be that it is more consistent with prevailing Western cultural norms that emphasize symptom reduction and subjective well-being.

Another possible explanation for these findings relates to the quantity of didactic material introduced in each treatment protocol. The tCBT protocol implemented primarily exposure and cognitive restructuring, whereas the ACT protocol implemented exposure in the context of several therapeutic processes of the ACT model. In the tCBT condition, cognitive restructuring was introduced over the course of only two sessions; subsequent sessions involved practicing these techniques and conducting exposure exercises. In contrast, six sessions in the ACT protocol introduced novel, though related, therapeutic processes. In the context of a relatively short-term treatment, the more

intuitive, less complex, and lower number of strategies of tCBT may have been easier to understand and apply than ACT strategies (Forman et al., 2012). Taken together with earlier research finding no differences between tCBT and ACT for SAD, it is possible that our ACT protocol's attempt to incorporate so much ACT-specific material decreased its effectiveness.

Interpretation of the apparent improved behavioral performance by participants in the ACT condition relative to those who received tCBT must be tempered by the underpowered nature of the analyses and lack of statistically-significant effects. It is nevertheless noteworthy that the observed trends are consistent with those found in several other studies comparing ACT and tCBT, which found that ACT resulted in greater improvements in behavioral performance but less improvement in self-reported symptoms (Brown et al., 2011; Glassman et al., 2016; Wagener & Zettle, 2011). Indeed, such findings are consistent with the stated goals of ACT, which aims to reduce attempts to control negative internal experiences and instead to enhance willingness to experience them in the pursuit of values-driven behavior (Hayes et al., 1999). Consistent with this focus, individuals who participate in ACT would be expected to feel less driven to reduce their anxiety and instead focus more on engaging in important tasks. In contrast, tCBT techniques are typically implemented with the explicit goal of symptom reduction. Moreover, techniques such as cognitive restructuring tend to require greater internal focus. These could result in lower availability of cognitive resources to focus on complex behavioral tasks, particularly in social situations. Some researchers have proposed that ACT techniques (e.g., cognitive defusion) are less cognitively demanding and require less working memory than tCBT techniques (Glassman et al., 2016). Preliminary results support this assertion; Glassman et al. (2016) found that participants given an ACT intervention for public speaking anxiety showed a decrease in blood volume in the left dorsolateral prefrontal cortex while giving a speech, whereas those given a tCBT intervention tended to show an increase in blood volume in this region. These authors concluded that tCBT strategies may have encouraged greater use of verbal processes, which might have taxed working memory more than ACT strategies. In the context of related literature, the trend-level findings favoring greater behavioral improvement in ACT participants in the current study highlights the importance of including measures of behavioral performance in future clinical trials for SAD, and indeed for other anxiety disorders as well.

Notably, participants in the tCBT group reported a somewhat better working alliance with their therapists than participants in the ACT group, which could partially explain the observed differences in outcomes. However, because the group by time interaction effect for social anxiety symptoms remained significant when working alliance scores were included in the model, we can conclude that greater alliance in the tCBT group did not fully account for treatment differences. Given that therapists saw participants in both conditions, differences in therapeutic alliance likely reflect treatment differences. It is possible that participants in the ACT condition felt an inferior alliance with their therapists because of the counterintuitive theoretical framework upon which ACT is based.

Strengths of the present study include explicit quantification of exposure dose, use of a multimodal assessment strategy that included behavioral performance, and a demographically-diverse sample.

We also acknowledge several limitations. The subsample of participants for whom we collected behavioral data is relatively small ($n = 23$), though analyses suggest these participants were representative of the sample as a whole. Additionally, the study included a small sample size in each group, thereby limiting statistical power. The amount of research on differential behavioral outcomes in treatment trials is quite limited. Although these results significantly add to the literature, replication in a more highly-powered study is necessary before drawing strong conclusions.

Baseline condition differences may partially account for some of the differential treatment effects. However, it is unlikely that baseline differences fully account for findings because treatment differences were not consistent across outcome variables. Moreover, trends favoring one condition were observed in some cases in which there were no baseline differences (e.g., in speech task). Though attrition was not significantly different across groups, baseline differences may help explain the apparent greater attrition in the tCBT group, whereby a larger percentage of tCBT participants compared to ACT participants in the ITT sample reported working full-time (see Table 1).

Our procedure for assessing therapist adherence presents an additional limitation. Though the accuracy rate with which raters categorized audio recordings as ACT or tCBT was very high (99.48%), this method does not include examination of the degree to which all treatment components were addressed.

Although our attrition rate of 25% is comparable to the rate reported by a meta-analysis of CBT studies for anxiety disorders (23%; Hofmann & Smits, 2008), an additional limitation is that we were unable to obtain post-treatment data from all participants who completed treatment. Again, we therefore urge caution in drawing strong conclusions from these findings until they can be replicated, as participants willing to complete post-treatment assessments might have had qualitatively different treatment experiences than participants who did not complete these assessments. Additionally, although study therapists received thorough training and supervision in treatment delivery, they were graduate students with limited clinical experience. This limitation is shared by similar comparative trials of ACT and tCBT (Arch et al., 2012; Craske et al., 2014). Higher therapist allegiance to the ACT versus tCBT protocol presents a potential confound. However, results indicating that the tCBT group reported more symptom reduction suggest that therapist allegiance did not account for treatment differences. Finally, we did not assess outcomes at follow-up and cannot determine whether treatment differences were sustained over a longer time period.

This study found significantly greater improvement in the tCBT condition in self-reported and clinician-related symptoms and functioning compared to the ACT condition, which contrasts with prior comparative studies that found no group differences in key outcomes. Future comparative trials should include multimodal assessment strategies, collect data over longer follow-up periods, and consider a longer course of treatment. Future research should also address potential differences in mediational variables across various treatments in an effort to illuminate treatment mechanisms. Some studies have found that ACT and tCBT affect outcomes through different mediational mechanisms (Forman, Herbert, Moitra, Yeomans, & Geller, 2007), whereas others have suggested they operate through similar mediational pathways (Arch & Craske, 2008).

In sum, this study replicates and extends previous comparative trials of tCBT and ACT for SAD by using multimodal assessments, and by ensuring that the amount of exposure was comparable across conditions. We found that participants in the tCBT condition reported greater improvements in self-report and clinician-rated measures. Additionally, participants in the tCBT condition tended to demonstrate less improvement in observer-rated social performance compared to ACT participants. This discrepancy is consistent with an emerging literature finding that ACT interventions appear to be associated with greater improvements in behavioral performance despite equivalent or smaller improvements in symptoms.

## Declarations of interest

None.

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