Mindfulness and acceptance-based group therapy versus traditional cognitive behavioral group therapy for social anxiety disorder: A randomized controlled trial

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ABSTRACT

Recent research has supported the use of mindfulness and acceptance-based interventions for Social Anxiety Disorder (SAD).
Objective: The purpose of the present study was to compare mindfulness and acceptance-based group therapy (MAGT) with cognitive behavioral group therapy (CBGT) with respect to outcome. It was hypothesized that MAGT and CBGT would both be superior to a control group but not significantly different from one another.
Method: Individuals ($N = 137$, mean age = 34 years, 54% female, 62% White, 20% Asian) diagnosed with SAD were randomly assigned to MAGT ($n = 53$), CBGT ($n = 53$) or a waitlist control group ($n = 31$). The primary outcome was social anxiety symptom severity assessed at baseline, treatment midpoint, treatment completion, and 3-month follow-up. Secondary outcomes were cognitive reappraisal, mindfulness, acceptance, and rumination. Depression, valued living, and group cohesion were also assessed.
Results: As hypothesized, MAGT and CBGT were both more effective than the control group but not significantly different from one another on social anxiety reduction and most other variables assessed.
Conclusions: The present research provides additional support for the use of mindfulness and acceptance-based treatments for SAD, and future research should examine the processes by which these treatments lead to change.

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There is extensive support for the use of traditional cognitive behavior therapy (CBT) for social anxiety disorder (SAD; see Heimberg, 2002 for a review). However, in recent years more attention is being paid to the minimal improvement (Hofmann & Bögels, 2006) and continued dissatisfaction with life (Eng, Coles, Heimberg, & Safren, 2005) experienced by many patients following traditional CBT. This has led to refinement of traditional CBT approaches (e.g., Clark et al., 2006) and exploration of other CBT approaches such as acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 1999) that may serve as alternative treatment options.

ACT is a contextual behavioral treatment that uses mindfulness, acceptance and behavioral strategies to promote behavior change consistent with personal values (Hayes, Villatte, Levin, & Hildebrandt, 2011). There is growing empirical support for the effectiveness of ACT for a wide range of psychological conditions, including anxiety disorders (see Ruiz, 2010 for a review). A major process targeted by ACT is *experiential avoidance*, "the phenomenon that occurs when a person is unwilling to remain in contact with particular private experiences (e.g., bodily sensations, emotions, thoughts, memories, behavioral predispositions) and takes steps to alter the form or frequency of these events and the contexts that occasion them" (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996, p. 1154). In SAD, experiential avoidance is thought to manifest in overt and subtle avoidance behaviors that interfere in values-based behavior (Herbert & Cardaciotto, 2005). An intervention aimed at explicitly targeting experiential avoidance may be particularly helpful in the treatment of SAD.

Our efforts have focused on an ACT-based group approach for SAD, mindfulness and acceptance-based group therapy (MAGT; for

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a more detailed theoretical rationale for our approach, see Kocovski, Fleming, & Rector, 2009), as an alternative to traditional CBT. In MAGT, mindfulness and other strategies are used to promote acceptance ("actively contacting psychological experiences – directly, fully, and without needless defense – while behaving effectively", Hayes et al., 1996, p. 1163) of unwanted physical symptoms (e.g., sweating, shaking), and anxious thoughts (e.g., about embarrassing oneself, or being negatively evaluated by others) in order to reduce overt and subtle avoidance of anxiety-provoking situations, and increase values-based action. Exposure exercises (conducted with an acceptance rationale) provide opportunities to practice acceptance while engaging in values-based behaviors (Hayes et al., 2011). In a pilot study of MAGT ($N = 42$), we found medium to large effect sizes on social anxiety reduction and 43% of the intent-to-treat sample achieved clinically significant change (Kocovski et al., 2009). Our findings were consistent with those from two previous open trials of individual (Dalrymple & Herbert, 2007; $N = 19$) and group ACT (Ossman, Wilson, Storaasli, & McNeill, 2006; $N = 22$) for SAD.

No published randomized controlled trials (RCTs) for SAD have compared ACT-based treatments with traditional CBT, the most evidence-based psychotherapy for SAD. Hence, the main purpose of the present study was to compare MAGT with cognitive behavioral group therapy (CBGT; Heimberg & Becker, 2002), the most empirically-supported group CBT intervention for SAD. Further, both treatments were compared with a waitlist control group, and as such, this study represents the first RCT for any anxiety disorder to compare an ACT-based treatment to both active and inactive control groups.

Present study

Based on the pilot study that found effect sizes for MAGT similar to those found for CBGT, it was hypothesized that MAGT and CBGT would both be superior to a waitlist control group (WAIT) but not significantly different from one another. This pattern was hypothesized for the primary outcome variable of social anxiety, as well as depression. Further, given the strong focus on values in MAGT, it was hypothesized that MAGT would result in greater increases in valued living compared to CBGT.

Secondary outcomes were cognitive reappraisal, mindfulness, acceptance, and rumination. Cognitive reappraisal, an emotion regulation strategy in which the interpretation of a situation is changed in order to reduce the emotional impact (Gross & John, 2003), is closely related to cognitive restructuring, one of the main elements of treatment for CBGT. As such, it was hypothesized that cognitive reappraisal would increase for the CBGT group, as has been found in other studies (e.g., Moscovitch et al., 2012). Further, given that MAGT includes mindfulness as an element of treatment and focuses on cultivating acceptance, significant increases in mindfulness and acceptance were expected for MAGT, as was found in our pilot study (Kocovski et al., 2009). Finally, given that rumination is targeted directly or indirectly in both forms of treatment, and there is evidence that mindfulness treatments (e.g., Ramel, Goldin, Carmona, & McQuaid, 2004; as well as our pilot study, Kocovski et al., 2009) and CBT (Price & Anderson, 2011) can reduce rumination, both treatments were expected to result in decreased rumination.

Method

Participants

Participants ($N = 137$) were recruited via advertisements in local newspapers, letters sent to physicians informing them of the study,

and flyers posted in clinics and other public places in the Greater Toronto Area. Inclusion criteria were: principal diagnosis of SAD, Generalized (based on criteria from the Diagnostic and Statistical Manual of Mental Disorders, 4th ed., text revision [DSM-IV-TR]; American Psychiatric Association, 2000 assessed using the Structured *Clinical Interview for DSM-IV* [SCID-IV]; First, Spitzer, Gibbon, & Williams, 1996); English fluency; and age between 18 and 65 years. Exclusion criteria were: current major depressive disorder (MDD); current alcohol or substance abuse or dependence; lifetime psychosis; lifetime mania; current suicidal intent; and past ACT or CBT for SAD. Psychotropic medications were allowed if doses were stable in the 3 months prior to the study and there was agreement to remain stable for the study duration.

There were no significant differences across conditions on demographics or comorbid diagnoses (see Table 1; effect sizes [d] ranged from .07 to .35). Ages ranged from 18 to 62 years. Ethnicities included White (62%), Asian (20%), Black (3.6%), Hispanic (3.6%) and other (10.9%). Most completed college or university (63.5%) or at least some postsecondary education (27.0%). Religious status was as follows: none (38.0%), Catholic (16.1%), Protestant (12.4%), Buddhist (8.0%), Muslim (5.1%), Jewish (3.6%), Hindu (.7%), and other (16.1%).

Materials

All self-report measures described below (with the exception of the Group Cohesion Scale) were completed at baseline, midtreatment (6 weeks), and posttreatment (12 weeks) by all groups. MAGT and CBGT also completed these measures at the 3-month follow-up. WAIT participants were offered treatment at the end of the waiting period and did not take part in the follow-up assessment.

Primary outcome. The primary outcome measure was the *Social Phobia Inventory* (SPIN: Connor et al., 2000), a 17-item self-report measure of fear and avoidance of a range of social situations and of physiological symptoms of anxiety. The SPIN has been validated for use in clinical populations, has strong convergent and discriminant validity, and good internal consistency and test–retest reliability (Antony, Coons, McCabe, Ashbaugh, & Swinson, 2006; Radomsky et al., 2006). Alphas ranged from .88 to .92 across the four assessment points in the present study.

Clinician-administered measures. There were two clinician-administered measures at baseline, posttreatment and follow-up (but not at midtreatment). The 24-item *Liebowitz Social Anxiety Scale* (LSAS; Liebowitz, 1987) assesses fear and avoidance of

Table 1
Demographics and comorbidities across conditions.

Variable	CBGT	MAGT	WAIT	F or χ^2	p
Demographics:					
Mean age (years)	32.66	34.94	36.55	1.30	.28
(SD)	(9.07)	(12.52)	(11.58)		
SAD duration (years)	18.55	22.17	23.84	1.99	.14
(SD)	(10.84)	(13.94)	(13.22)		
% Female	52.83	49.06	64.52	1.93	.38
% Single	58.49	62.26	67.74	.71	.70
% White	52.83	69.81	64.52	3.35	.19
% Current psychotropic medications	28.30	47.17	38.71	4.02	.13
Comorbidities (%):					
Past major depression	45.28	49.06	45.16	.19	.91
Dysthymic disorder	3.77	3.77	9.68	1.72	.42
Lifetime alcohol	11.32	20.75	25.81	3.12	.21
Lifetime substance	15.09	15.09	19.35	.32	.85
Other anxiety[a]	16.98	22.64	16.13	.76	.68

Note: $F(2,134)$ values reported for age and duration; χ^2 (2) values for all other variables. CBGT = cognitive behavioral group therapy; MAGT = mindfulness and acceptance-based group therapy; WAIT = waitlist control condition; SAD = social anxiety disorder.

[a] Participants may have met criteria for more than one other anxiety disorder.

performance and social interaction situations, and has strong psychometric properties. Alphas were excellent in the present study, ranging from .93 to .96. The *Clinical Global Impression* (CGI; Guy, 1976) severity and improvement scales were also used as measures of treatment efficacy (Zaider, Heimberg, Fresco, Schneier, & Liebowitz, 2003). Two clinical psychology graduate students, blind to condition, administered the LSAS, CGI, and SAD section of the SCID at posttreatment (for all groups) and follow-up (for MAGT and CBGT only).

Secondary outcomes. The 6-item Reappraisal subscale of the *Emotion Regulation Questionnaire* (ERQ; Gross & John, 2003) was used to assess cognitive reappraisal. Alphas for the ERQ are generally good (.84–.89 in the present study) and test–retest reliability was .69 over 3-months (Gross & John, 2003). The 14-item *Freiburg Mindfulness Inventory* (FMI; Walach, Buchheld, Buttenmüller, Kleinknecht, & Schmidt, 2006) was used to assess mindfulness. It was first developed as a 30-item scale for experienced meditators (Buchheld, Grossman, & Walach, 2001) but later shortened to a 14-item version that can be used with nonmeditators, and which correlates highly ($r = .95$) with the full version (Walach et al., 2006). The FMI measures mindfulness as a unidimensional construct with the following inter-related facets: mindful presence, non-judgmental acceptance, openness to experiences, and insight. Alphas ranged from .82 to .92 in the present study. The 19-item *Social Anxiety-Acceptance and Action Questionnaire* (SA-AAQ; MacKenzie & Kocovski, 2010) was used to assess acceptance specific to social anxiety. It was based on the AAQ (Hayes et al., 2004) but adapted so items reflect a social anxiety context. Sample items include: "I criticize myself for having irrational or inappropriate social anxiety" (reverse scored) and "I get on with my life even when I feel socially anxious". There was support for a unidimensional factor structure in two nonclinical samples. The SA-AAQ correlated with measures of social anxiety but at a lower magnitude than measures of social anxiety correlated with each other and it correlated moderately with the AAQ-II and mindfulness (MacKenzie & Kocovski, 2010). The SA-AAQ has excellent internal consistency (.94 in MacKenzie & Kocovski, 2010; range of .88–.95 in the present study). The 12-item Rumination subscale of the *Rumination Reflection Questionnaire* (RRQ; Trapnell & Campbell, 1999) was used to assess rumination. The subscale has been shown to have good reliability in the original sample (alpha of .90; Trapnell & Campbell, 1999), as well as the current study (.90–.93).

Additional variables. The 21-item *Beck Depression Inventory – Second Edition* (BDI-II; Beck, Steer, & Brown, 1996) was used to assess depressive symptoms in the past week. There is considerable psychometric data on the BDI-II across various populations and alphas were excellent in the present study (.89, .90). The 20-item *Valued Living Questionnaire* (VLQ; Wilson, Sandoz, Kitchens, & Roberts, 2010) was used to assess valued living. Respondents first indicate the importance of a life area and then how much they are living life according to their values in that area. The VLQ was originally developed as a clinical tool but has since been evaluated for its psychometric properties (Wilson et al., 2010). Finally, given that group cohesion has been found to correlate with outcome for group CBT for SAD (Taube-Schiff, Suvak, Antony, Bieling, & McCabe, 2007), it was assessed using the 25-item *Group Cohesion Scale-Revised* (GCS-R; Treadwell, Lavertue, Kumar, & Veeraraghavan, 2001). The GCS-R has good internal consistency (.86 at midtreatment and .87 at posttreatment) and support for its sensitivity to detect change in cohesiveness in class settings (Treadwell et al., 2001).

Procedure

The study was approved by the local Research Ethics Board. Prospective participants phoned, emailed, or completed an online form. An initial brief phone interview was conducted to screen for inclusion and exclusion criteria and diagnostic interviews using the SCID-IV were scheduled for those eligible for further screening. The SCID-IV assessments were administered by clinical psychology graduate students and audio-recorded if participants provided consent ($n = 112$). Training involved students observing at least five interviews by the first author (who has over 10 years of experience with SCID administration); further, the first author observed at least five interviews administered by each student. Ongoing supervision included listening to audio files and weekly meetings. A randomly selected subset of audio files (20%) was rated for inter-rater reliability by clinical psychology graduate students. There was 100% agreement on the diagnosis of SAD, generalized type.

Randomization. For the first three rounds of groups, the ratio of participants assigned to MAGT, CBGT or WAIT was equivalent. Recruitment became increasingly difficult and as such, for rounds four through six, fewer participants were assigned to WAIT (ratio of 2:2:1 for CBGT, MAGT, and WAIT, respectively) and none were assigned to WAIT for the seventh round. MINIM software (Evans, Day, & Royston; freely available on the internet) was used for the randomization procedure, which included three stratification variables: age (>30 or ≤ 30 years), gender (male, female), and social anxiety severity (LSAS > 75 or ≤ 75).

Participant flow. Fig. 1 documents participant flow. Reasons given by those who did not attend a scheduled SCID included time commitment and lack of compensation, but not everyone gave a reason. There were 2 eligible people who did not consent (reasons: chose medication instead, time conflict), and 21 consented and later withdrew consent[1] due to the time commitment (10), group format (4) or being assigned to WAIT (1) (6 did not provide a reason).

Therapists and therapy protocols

Each therapy consisted of 12 weekly 2-hr sessions and a 3-month follow-up brief check-in session. The first two authors (psychologist and psychiatrist) conducted all therapy sessions. Both are experienced therapists with formal training in CBT, ACT, and mindfulness-based cognitive therapy (MBCT; Segal, Williams, & Teasdale, 2002). A randomly selected subset (20%) of video files was rated for therapist adherence. Given there were no published adherence measures for these particular treatments, ratings were based on whether agenda items (e.g., mindfulness exercises, cognitive restructuring), viewed as proxy measures for therapy-specific elements, were covered. A graduate student in clinical psychology evaluated whether each agenda item was covered. For CBGT, 95.21% of agenda items, and for MAGT, 97.80% of agenda items, were covered.

CBGT (Heimberg & Becker, 2002). Briefly, the first two sessions in CBGT focused on an introduction to the CBT model and cognitive restructuring. Sessions three to 11 focused on in-session exposures (using an extinction rationale) with cognitive restructuring prior to each exposure and cognitive debriefing afterwards. Homework, consisting of exposures and cognitive restructuring, was reviewed and set each week. In both CBGT and MAGT, session 12 and the briefer follow-up session focused on review and planning.

MAGT. An unpublished manual was used (Fleming & Kocovski, 2009); therefore details are provided. Session one included an introduction to the ACT model of social anxiety and mindful eating

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[1] We compared people who withdrew consent with participants in the present study and there were no significant differences on age, SAD severity (LSAS), or SAD duration (p's ranged from .67 to .95). The 'withdrew consent' sample was also very similar to the study participants with respect to all other demographics and comorbidities (e.g., 52% female, 48% single, 43% had a history of major depression).
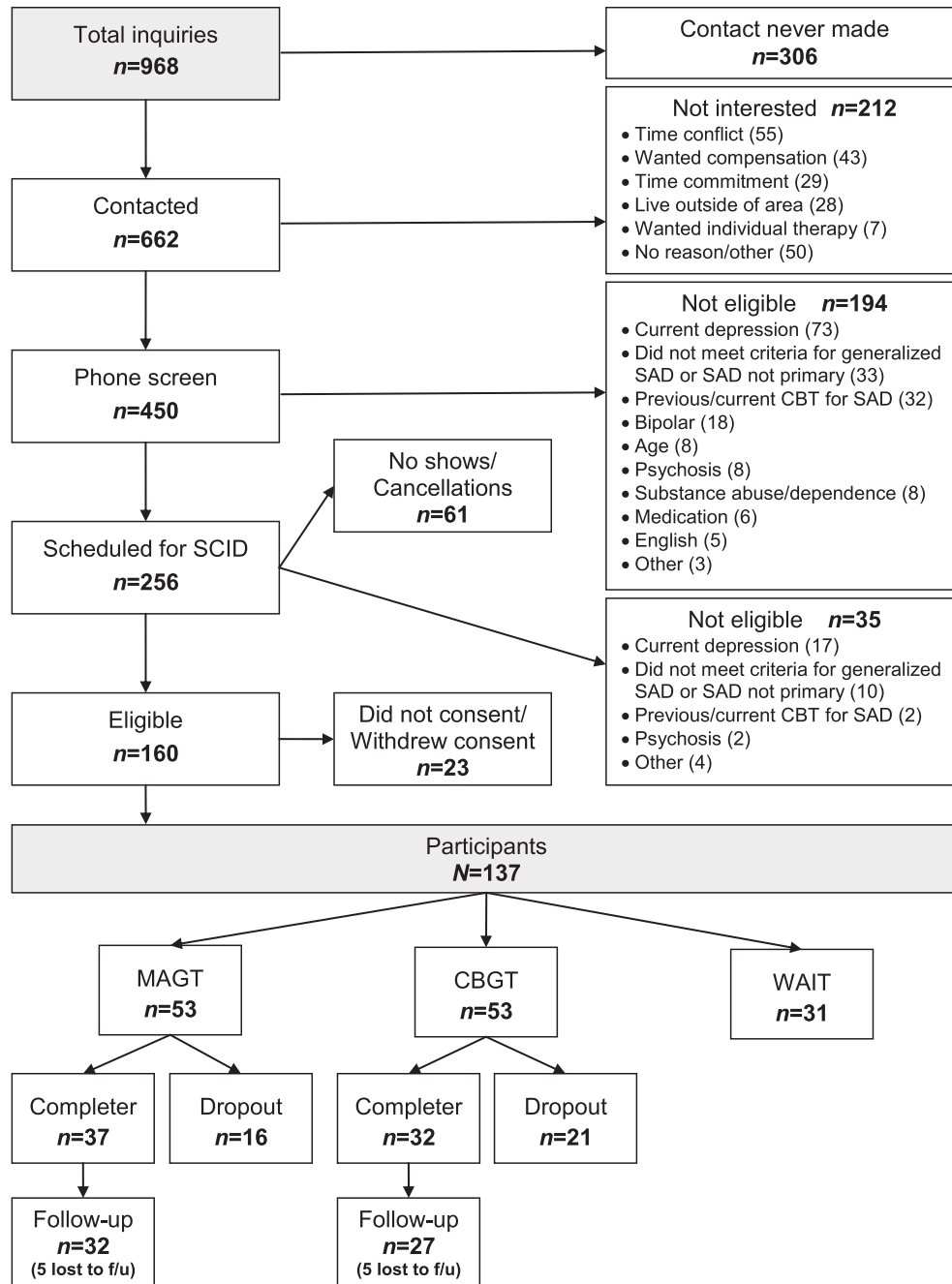
Note: CBGT = cognitive behavioral group therapy; MAGT = mindfulness and acceptance-based group therapy; WAIT = waitlist control condition; SAD = social anxiety disorder.

Fig. 1. Participant flow.

of a raisin. Subsequent sessions began with a mindfulness exercise (lasting approximately 15 min), followed by inquiry. Most mindfulness exercises were adapted (shortened) from MBCT (e.g., body scan, mindful stretching, mountain meditation). Acceptance of thoughts and feelings and acceptance of social anxiety exercises were adapted from Eifert and Forsyth (2005). Homework was reviewed after the mindfulness exercise and consisted of mindfulness exercises (using a CD recorded by the first two authors), written work that addressed core concepts, and exposures. Sessions two through six introduced topics such as the costs of control/ experiential avoidance, values and goals, defusion ("the process of

relating to thoughts as just thoughts so as to reduce their automatic impact", Hayes et al., 2011, p. 155), and willingness to experience anxiety as an alternative to control. Sessions seven through 11 concentrated on exposure (using an acceptance rationale) (see above for session 12 and follow-up).

Data analysis

Intent-to-treat (ITT) analyses were the main indicators of outcome, although results are also reported for treatment completers. Symptom trajectories were modeled using hierarchical

linear modeling (HLM), with the HLM6 program by Bryk, Raudenbush, and Congdon (2004). HLM was used to analyze the self-report measure of social anxiety (SPIN) as well as the secondary outcome measures. Given there were only two time points for the clinician-administered measures for WAIT, HLM could not be used for those measures. The numbers we used to represent time points in our HLM analyses were coded 1, 2, 3, and 5, to reflect the fact that the first two time intervals were 6 weeks long, while the third time interval was 12 weeks long. Graphical examination of symptom trajectories across the four time points showed that they were predominantly linear, and thus could be represented by a linear model. Two-level modeling (HLM2) was used. The Level 1 (within-person) independent variable was time and the dependent variable was social phobia, cognitive reappraisal, mindfulness, acceptance, or rumination. Each person's regression equation predicting an outcome across time points was summarized using a slope (change in outcome over time). Group mean centering was used, given that it slightly reduces the error in estimating the coefficients. In analyses comparing different treatment conditions, the Level 2 (between-person) independent variable was a "dummy coded" variable comparing either CBGT with WAIT, MAGT with WAIT, or CBGT with MAGT; the independent variables were studied one at a time, given they represented different subsets of the data. In a given analysis, the Level 2 independent variable was used as a predictor of the Level 1 slope (which revealed whether two conditions differed in their rate of change over time). In all analyses, Level 1 slopes were allowed to vary from person to person, as it was reasonable to expect that people would differ in their rate of symptom improvement.

The HLM analyses described above were the main outcome analyses. However, univariate analyses of variance (ANOVAs) were used to compare baseline scores across conditions on all measures with follow-up Tukey posthoc tests on any significant main effects. Univariate analyses of covariance (ANCOVAs) were used to compare conditions on mid and posttreatment scores for each variable with the corresponding pretreatment score as a covariate and Bonferroni corrected posthoc tests were used to compare groups on any significant main effects. Last observation carried forward was the approach taken for missing data for these analyses (but not the HLM analyses described above). Effect sizes were calculated as per Smith and Glass (1977) and confidence intervals were then computed for the effect sizes (Hedges & Olkin, 1985). Reliable change and clinically significant change were also evaluated (Jacobson & Truax, 1991). To determine whether there was significant change during the follow-up period, repeated measures ANOVAs were used comparing posttreatment and follow-up scores, with treatment group as a between-subjects factor in each analysis. Last observation carried forward was not used for missing follow-up data given that it would assume no change in the follow-up period; only the data submitted were analyzed. With respect to power analyses, based on an estimated controlled effect size of .70 on the primary outcome measure and a power of .80, 120 participants were required. Therefore, our sample size of 137 participants was adequate.

Results

Attrition

To be classified as treatment completers, participants had to attend a minimum of eight (out of 12) sessions. For CBGT, 32 (out of 53) participants completed treatment (60%). For MAGT, 37 (of 53) completed treatment (70%). The dropout rates of 40% for CBGT and 30% for MAGT were not significantly different from one another, $\chi^2 (1) = 1.04$, $p = .31$. Reasons for dropout were assessed

(most common was time commitment), and will be reported elsewhere.

Descriptive statistics and preliminary analyses

Table 2 reports on the means and SDs for the ITT sample (using last observation carried forward), as well as ANOVAs and ANCOVAs for the self-report measures at pretreatment, midtreatment, and posttreatment. The pattern at posttreatment is that MAGT and CBGT were both significantly different from WAIT but not different from one another with two exceptions: MAGT scored significantly higher than WAIT on mindfulness but CBGT did not, and neither group differed significantly from WAIT on reappraisal. Controlled effect sizes (using the SPIN) were 1.02 for CBGT and 1.00 for MAGT (95% CI = [.53, 1.47] for both treatments). For treatment completers, the pattern was the same with one exception (main effect for BDI at midtreatment with MAGT scoring significantly lower than WAIT) and the controlled SPIN effect sizes were 1.31 for CBGT ($n = 32$; 95% CI = [.76, 1.86]) and 1.32 for MAGT ($n = 37$; 95% CI = [.79, 1.85]).

HLM

Findings were very similar for the ITT and completer samples; only the ITT results are reported below. These analyses are based on data from 137 participants at pretreatment, 107 at midtreatment, 91 at posttreatment and 54 at follow-up.

Test of variance of slope. Preliminary analyses were run without any Level 2 predictor to test whether the slope of each outcome varied significantly from person to person. For the SPIN, the slope ($\chi^2(108) = 150.18$, $p = .01$) had a significant variance, which provided statistical justification for proceeding to add a predictor at Level 2 that might account for some portion of the variance. The slope had a reliability of .28, which was in the acceptable range for allowing the slope to vary and for interpreting significant results, but was low enough to suggest that null findings might represent a Type II error. Slopes for the secondary outcome variables (cognitive reappraisal, mindfulness, acceptance, rumination) also had significant variances ($\chi^2(108)$ ranged from 138.39, $p = .03$ to 215.82, $p < .001$) and reliabilities ranged from .20 to .46.

Only a small number of iterations (fewer than 60) was required to reach convergence in most HLM analyses, indicating there were sufficient data for the complexity of the model being tested.

Each condition on its own. Prior to comparing the three conditions, the degree of improvement within each condition was examined (see Table 3). From pretreatment to follow-up, CBGT decreased on the SPIN by 18.04 units (slope of −4.51 per time point) and MAGT decreased by 13.28 (slope of −3.32 per time point). The secondary outcome variables all improved significantly for CBGT and MAGT but not WAIT. (The variance accounted for in mindfulness, acceptance and rumination in Table 3 is high for WAIT due to low initial variance in these scores.)

Comparing CBGT and WAIT. CBGT showed a significantly faster rate of improvement over time than did WAIT, improving 3.04 units or 1.42 SDs faster per time point, accounting for 23% of the variance in SPIN slopes over time (see Table 4). With respect to the secondary outcome variables, CBGT and WAIT differed significantly on slopes for mindfulness and acceptance, but not cognitive reappraisal, and the difference approached significance for rumination.

Comparing MAGT and WAIT. MAGT showed a significantly faster rate of improvement over time than WAIT, improving 1.73 units or 1.80 SDs faster per time point, accounting for 28% of the variance in SPIN slopes over time. MAGT and WAIT differed significantly on slopes for all secondary outcome variables except cognitive reappraisal.

Table 2
Self-report measures across treatment, across conditions: intent-to-treat.

Assessment	CBGT ($n = 53$)		MAGT ($n = 53$)		WAIT ($n = 31$)		Group effect
	M	SD	M	SD	M	SD	
Social phobia inventory							
Pretreatment	43.68	12.16	42.43	12.84	46.71	8.92	$F(2,134) = 1.30$
Midtreatment	36.73$_a$	13.03	39.64$_b$	12.67	44.32$_b$	10.42	$F(2,133) = 5.21$**
Posttreatment	33.72$_a$	14.04	33.91$_a$	14.79	43.82$_b$	9.90	$F(2,133) = 6.22$**
Social anxiety-acceptance and action questionnaire							
Pretreatment	62.17	17.84	62.06	14.22	63.45	16.29	$F(2,134) = .08$
Midtreatment	72.70$_a$	17.47	70.60$_a$	16.88	63.23$_b$	19.51	$F(2,133) = 6.30$**
Posttreatment	75.77$_a$	18.54	78.53$_a$	19.92	66.45$_b$	19.07	$F(2,133) = 5.53$**
Freiburg mindfulness inventory							
Pretreatment	29.42	6.22	29.00	5.95	30.42	7.00	$F(2,134) = .50$
Midtreatment	30.79	6.38	29.72	6.40	30.19	6.88	$F(2,133) = 1.16$
Posttreatment	31.47$_{ab}$	7.27	32.77$_a$	6.97	30.42$_b$	7.63	$F(2,133) = 4.62$*
Emotion regulation questionnaire – reappraisal subscale							
Pretreatment	24.72	6.96	23.55	7.04	23.52	7.38	$F(2,134) = .45$
Midtreatment	26.23	7.20	25.34	6.08	25.06	8.23	$F(2,133) = .05$
Posttreatment	27.25	7.46	25.75	6.83	24.68	8.28	$F(2,133) = .94$
Rumination reflection questionnaire – rumination subscale							
Pretreatment	48.42	7.83	49.87	5.83	49.39	8.35	$F(2,134) = .55$
Midtreatment	45.98$_a$	8.29	48.34$_{ab}$	6.45	50.03$_b$	6.81	$F(2,133) = 3.75$*
Posttreatment	43.89$_a$	9.02	45.11$_a$	7.70	49.03$_b$	7.18	$F(2,133) = 4.99$**
Beck depression inventory-II							
Pretreatment	15.85	9.28	17.04	10.27	16.15	10.50	$F(2,134) = .20$
Midtreatment	13.91	9.52	13.66	9.35	16.29	11.12	$F(2,133) = 2.52$
Posttreatment	12.45$_a$	9.64	12.41$_a$	8.74	16.32$_b$	9.89	$F(2,133) = 5.36$**
Valued living questionnaire							
Pretreatment	46.45	12.85	44.78	13.33	46.35	16.35	$F(2,134) = .23$
Midtreatment	49.73	14.33	47.29	15.32	44.21	16.17	$F(2,133) = 2.62$
Posttreatment	52.27$_a$	16.08	49.71$_a$	15.16	44.28$_b$	18.67	$F(2,133) = 5.34$**

Note. Means in the same row that share subscripts or do not have subscripts are not significantly different. Means in the same row with different subscripts are significantly different at $p < .05$ or better. For pretreatment, the group effect is based on a oneway analysis of variance. For mid and posttreatment, the group effect is based on a oneway analysis of covariance with the pretreatment score as a covariate. CBGT = cognitive behavioral group therapy; MAGT = mindfulness and acceptance-based group therapy; WAIT = waitlist control condition.
*$p < .05$. **$p < .01$.

Table 3
HLM results: an examination of within-group change from pretreatment to follow-up for the intent-to-treat sample.

	CBGT					MAGT					WAIT				
	Coeff	d	% Var	t(52)	p	Coeff	d	% Var	t(52)	p	Coeff	d	% Var	t(30)	p
SPIN	−4.51	.39	47	−6.91	**.00**	−3.32	.37	35	−7.57	**.00**	−1.53	.31	8	−2.39	**.02**
FMI	1.16	.26	19	4.05	**.00**	1.61	.35	34	6.98	**.00**	.03	.01	29	.07	**.94**
SA-AAQ	5.35	.32	29	5.48	**.00**	5.21	.37	39	6.91	**.00**	.69	.11	50	.67	**.51**
ERQ	.92	.21	13	3.20	**.00**	.85	.17	26	2.58	**.01**	.55	.12	10	.87	**.39**
RRQ	−1.54	.25	22	−3.75	**.00**	−1.91	.32	43	−5.54	**.00**	−.20	.05	42	.31	**.76**

Note. Coeff = coefficient, i.e., the number of units change on the dependent variable per 6-week interval for the average client (there were a total of four 6-week intervals for CBGT and MAGT and two time intervals for WAIT); d refers to the number of standard deviations change on the dependent variable per 6-week interval for the average client; % var = percentage of within-person variance in the dependent variable accounted for by time; SPIN = Social Phobia Inventory; FMI = Freiburg Mindfulness Inventory; SA-AAQ = Social Anxiety-Acceptance and Action Questionnaire; ERQ = Emotion Regulation Questionnaire – cognitive reappraisal subscale; RRQ = Rumination Reflection Questionnaire – rumination subscale.

Table 4
HLM results: an examination of between-group comparisons on slopes.

	CBGT vs. WAIT					MAGT vs. WAIT					CBGT vs. MAGT				
	Coeff	d	% Var	t(82)	p	Coeff	d	% Var	t(82)	p	Coeff	d	% Var	t(104)	p
SPIN	−3.04	1.42	23	−3.67	**.00**	−1.73	1.80	28	−2.55	**.01**	−1.28	1.04	6	−1.66	**.10**
FMI	1.14	1.47	1	2.29	**.03**	1.58	3.22	15	3.40	**.00**	−.45	.98	5	−1.30	**.20**
SA-AAQ	4.69	1.65	21	3.44	**.00**	4.46	1.66	32	3.69	**.00**	.07	.04	<1	.06	**.95**
ERQ	.37	.73	<1	.55	**.59**	.32	.26	<1	.46	**.65**	.06	.06	<1	.15	**.88**
RRQ	−1.46	1.06	<1	−1.91	**.06**	−1.79	1.17	13	−2.46	**.00**	.35	.27	3	.66	**.51**

Note. Coeff = coefficient (i.e., how much the two groups being compared differ in their rate of change on the dependent variable per 6-week interval; a coefficient of −3.04 means that one group decreased by 3.04 units more than did the other group during each 6-week interval); d refers to how many standard deviations the two groups differ in their rate of change on the dependent variable per 6-week interval; % var = percentage of the between-person variance in the rate of change over time accounted for by the difference between the two groups; SPIN = Social Phobia Inventory; FMI = Freiburg Mindfulness Inventory; SA-AAQ = Social Anxiety-Acceptance and Action Questionnaire; ERQ = Emotion Regulation Questionnaire – cognitive reappraisal subscale; RRQ = Rumination Reflection Questionnaire – rumination subscale.

Comparing CBGT and MAGT. CBGT did not differ significantly from MAGT on slopes for any variable.

Clinician-administered measures

For posttreatment CGI improvement, for MAGT completers ($n = 37$), there were 23 patients (62.2%) rated as "much improved" or "very much improved", 11 (29.7%) as "minimally improved" and 2 (5.4%) as "no change" (and 1 missing data). For CBGT completers ($n = 32$), there were 22 patients (68.8%) rated as "much improved" or "very much improved", 5 (15.6%) as "minimally improved" and 3 (9.4%) as "no change" (and 2 missing data). For WAIT, about half were rated as "no change" ($n = 15$; 48.4%), 12 as "minimally improved" (38.7%), and there was one patient (3.2%) each in the "much improved" and "worse" categories (and 2 missing data). Overall, CBGT and MAGT were rated as more improved than WAIT, but not different from one another, $\chi^2(2) = 1.94$, $p = .38$.

Table 5 presents data on CGI severity and clinician-administered LSAS scores at pre and posttreatment. Groups did not differ significantly on these measures at pretreatment, $F(2,97) = .13$, $p = .88$ and $F(2,97) = .01$, $p = .99$, respectively. Last observation carried forward was used for the five participants (2 CBGT, 1 MAGT, and 2 WAIT) who did not attend the posttreatment assessment. At posttreatment, groups differed significantly on both measures, $F(2,97) = 5.47$, $p < .01$ and $F(2,97) = 9.06$, $p < .001$, respectively. CBGT and MAGT had significantly lower scores compared to WAIT on both variables (CGI: $p = .002$ for CBGT, $p = .02$ for MAGT; LSAS: $p < .001$ for both comparisons) but were not significantly different from one another.

Treatment compliance

The mean number of sessions attended was 9.78 (SD = 1.36) for CBGT and 10.16 (SD = 1.36) for MAGT completers, $t(67) = 1.16$, $p = .25$. CBGT participants completed an average of 21.19 (SD = 15.80) homework exposures, whereas those in MAGT completed 17.86 (SD = 9.71), $t(65) = 1.05$, $p = .30$. MAGT participants ($M = 5.72$, SD = 2.00) completed more in-session exposures than CBGT participants ($M = 4.50$, SD = 1.19), $t(66) = 3.00$, $p < .01$, and an average of 6 min of daily mindfulness practice, approximately half of what was assigned.

Group cohesion

CBGT (mid: $M = 76.96$, SD = 8.95, $n = 37$; post: $M = 78.30$, SD = 8.73, $n = 28$) did not differ significantly from MAGT (mid: $M = 75.25$, SD = 5.68, $n = 40$; post: $M = 78.67$, SD = 7.68, $n = 36$) on group cohesion at midtreatment, $t(75) = -1.01$, *ns* or posttreatment, $t(62) = .18$, *ns*.

Clinically significant change

To meet criteria for clinically significant change, participants had to demonstrate reliable change and also have a posttreatment SPIN score less than 31.1 (determined using Canadian normative data; the midpoint between a clinical sample mean as reported in Antony et al., 2006 and a healthy control sample mean as reported in Radomsky et al., 2006). For the ITT sample, 25 participants in CBGT (47.2%) and 20 participants in MAGT (37.7%) met criteria for reliable change, $\chi^2(1) = .97$, $p = .33$. Of those, 17 in each treatment group (32.1%) met criteria for clinically significant change. For completers, 22 in CBGT (68.8%) and 18 in MAGT (48.6%) met criteria for reliable change, $\chi^2(1) = 2.85$, $p = .09$. Of those, 14 in CBGT (43.8%) and 16 in MAGT (43.2%) met criteria for clinically significant change, $\chi^2(1) = .00$, $p = .96$.

Follow-up data

Five completers in each condition did not attend the follow-up assessment. Additionally two MAGT participants and three CBGT participants attended the follow-up but did not submit self-report questionnaires. During the follow-up period, three participants started another psychotherapy and one MAGT participant reported a change in medication. Most participants continued to report symptoms meeting criteria for SAD at the end of the study (one in MAGT and two in CBGT did not meet criteria). The pattern was such that gains were maintained but there were no significant further gains for either group during the follow-up period (see Table 6). CBGT and MAGT did not differ significantly at follow-up, controlling for pretreatment scores.

For CGI improvement, for CBGT, 19 participants (70.4%) were rated as much improved or very much improved, 5 (18.5%) as minimally improved, and 3 (11.11%) as no change. For MAGT, 22 participants (68.8%) were rated as much improved or very much improved, 6 (18.8%) as minimally improved, 3 (9.4%) as no change, and 1 (3.1%) as minimally worse (attributed by this participant to a new stressful job). The pattern was similar for both groups.

Discussion

The primary purpose of the present study was to compare MAGT with CBGT in terms of treatment efficacy. This is the first published trial comparing an ACT-based treatment for SAD to traditional CBT for SAD, and the first trial for any anxiety disorder, as far as we know, to compare an ACT-based treatment to both active and inactive control groups. Participants in MAGT did as well on average as those in CBGT, and participants in both treatments maintained their gains at 3-month follow-up. The amount of change was clinically meaningful for both groups; a third of the full sample and 40% of treatment completers met criteria for clinically significant change, with no differences across the active treatment groups. It is also worth noting that compared to WAIT, both groups demonstrated significant decreases in depression, and did not differ on group cohesion. Together with the findings from the pilot study, these results provide additional support for the use of MAGT for SAD. Our outcome findings also contribute to the nascent literature comparing ACT to traditional CBT for anxiety disorders. Specifically, they were consistent with Arch et al. (2012) who found similar improvement between individual ACT and CBT in a sample of

Table 5
Means (and SDs) for clinician-administered measures for treatment completers vs. WAIT.

Measure	CBGT ($n = 32$)		MAGT ($n = 37$)		WAIT ($n = 31$)	
	Pre	Post	Pre	Post	Pre	Post
LSAS	79.41 (18.57)	49.48 (21.95)	79.61 (19.12)	49.64 (19.87)	80.13 (16.40)	68.53 (20.04)
CGI-severity	5.03 (.63)	4.31 (1.18)	5.06 (.74)	4.54 (.99)	4.97 (.71)	5.15 (.92)

Note. Pretreatment means were not significantly different from one another. Post-treatment means were significantly higher in WAIT compared to both treatment groups. CBGT = cognitive behavioral group therapy; MAGT = mindfulness and acceptance-based group therapy; WAIT = waitlist control condition; LSAS = Liebowitz Social Anxiety Scale; CGI = Clinical Global Impression.

Table 6
Assessing change from post-treatment to 3-month follow-up for CBGT and MAGT.

Variable	CBGT		MAGT		Group effect
	Post	Follow-up	Post	Follow-up	
Self-report[a]:					
SPIN	29.33 (10.82)	25.33 (12.11)	29.60 (13.62)	29.40 (13.72)	$F(1,51) = 2.60$
Clinician[b]:					
LSAS	46.94 (19.21)	43.52 (18.91)	48.80 (17.41)	49.28 (18.96)	$F(1,56) = 1.19$
CGI-severity	4.19 (1.18)	3.96 (1.06)	4.53 (.98)	4.06 (1.08)	$F(1,56) = .06$

Note. There were no significant differences from posttreatment to follow-up for either group. For group effect, *p* values ranged from .11 to .80. Figures in brackets are SDs. CBGT = cognitive behavioral group therapy; MAGT = mindfulness and acceptance-based group therapy; WAIT = waitlist control condition; SPIN = Social Phobia Inventory; LSAS = Liebowitz Social Anxiety Scale; CGI = Clinical Global Impression.
  [a] $n = 24$ for CBGT, $n = 30$ for MAGT.
  [b] $n = 27$ for CBGT, $n = 32$ for MAGT.

mixed anxiety disorders (20% with SAD). Finally, similar to Arch et al. (2012) but contrary to our hypothesis, MAGT did not lead to greater improvement in valued living compared to CBGT (there were comparable increases in the present study; CBT improved more than ACT in Arch et al., 2012).

As hypothesized, there were significant increases in mindfulness and acceptance for MAGT, and significantly decreased rumination in both MAGT and CBGT. Contrary to expectation, although cognitive reappraisal changed significantly across time for both MAGT and CBGT (not just CBGT), the rate of change (slope) was not significantly greater for the treatment groups compared to WAIT. Further, cognitive reappraisal was the only variable that was not significant in the ANCOVA analyses. Given the strong focus on cognitive restructuring in CBGT, these results are particularly surprising for that group. However, measurement issues cannot be ruled out. For example, in a laboratory study examining stress and depression in a community sample of women, the reappraisal subscale of the ERQ was not significantly correlated with actual reappraisal ability (Troy, Wilhelm, Shallcross, & Mauss, 2010).

Also contrary to expectation, there were significant increases in mindfulness and acceptance in CBGT even though those processes are not directly targeted in that approach. However, in their treatment manual, Heimberg and Becker (2002) state that "it is much more important to help the client learn that he or she is capable of functioning in the presence of anxiety than to try and eliminate it completely" (p. 249). As such, cognitive restructuring before exposures can generate rational responses such as: "I can carry on a pleasant conversation even if I'm anxious" and "The important things in life are sometimes difficult" (Heimberg & Becker, 2002, p. 195), which have clear acceptance themes. Similarly, in the present study, typical rational responses were: "It's okay to be anxious" or "It's okay to blush". Perhaps in hindsight it is not surprising that CBGT would lead to increases in acceptance and mindfulness (of which acceptance is a component). Additionally, it is possible that the FMI, which has a strong awareness component (another aspect of mindfulness), was able to pick up on the increased awareness of thoughts and feelings often targeted in CBT.

Similar findings for mindfulness, acceptance and reappraisal as treatment outcomes for MAGT and CBGT may also reflect overlap in these variables as mediators of treatment change. Indeed, the topic of shared and distinct mechanisms of change in ACT and traditional CBT has been the subject of ongoing discussion and debate (e.g., Arch & Craske, 2008; Hayes, 2008; Hofmann & Asmundson, 2008; Mennin, Ellard, Fresco, & Gross, 2013). Whereas the current paper focused on outcome and cannot speak directly to process, secondary analyses of treatment mediation for our study are currently underway and will be presented elsewhere.

An additional point regarding mindfulness is that MAGT participants completed on average 6 min per day of mindfulness homework which might lead us to conclude that relatively small amounts of mindfulness practice are sufficient to lead to change in self-reported mindfulness. However, increases in mindfulness could also have resulted from in-session practice or informal practice (not recorded by participants), or may result from aspects of treatment that implicitly target mindfulness (and may also be present in CBGT), such as a mindful therapeutic stance of the therapists. Of interest, in a review of the relationship between mindfulness home practice and outcome, only half of the studies found a significant relationship (Vettese, Toneatto, Stea, Nguyen, & Wang, 2009).

There are two points to consider with regard to the treatments we chose to assess. First, large effect sizes have been found for an individual cognitive therapy approach developed by Clark et al. (2006) that directly targets safety behaviors, focus of attention and other elements of the Clark and Wells (1995) model. It may be that incorporating some of these elements would have improved efficacy of CBGT in our study. However, research to date on group CBT for SAD based on Clark and Wells has been mixed; one study found enhanced group CBT (targeting safety behaviors, focus of attention, etc.) to be superior to standard group CBT (Rapee, Gaston, & Abbott, 2009) whereas several other studies of group CBT for SAD based on Clark and Wells have resulted in effect sizes similar to or smaller than the current study (summarized in McEvoy, 2007). Second, it may be that our treatments would have been more effective if delivered individually. Although findings from a recent meta-analysis of psychological treatments for SAD found evidence for superiority of individual compared to group approaches (Aderka, 2009; 511 participants in 18 trials), a larger meta-analysis found equal effectiveness of these modalities (Acarturk, Cuijpers, van Straten, & de Graaf, 2009; 1628 participants in 29 trials). In addition to being effective, group approaches also offer less costly alternatives to resource-intensive individual therapies which may not be affordable in many clinical settings. However, it is important to acknowledge that there are also disadvantages to group treatments, most importantly the loss of flexibility with which treatment can be delivered (e.g., decreased ability to tailor treatment to an individual, inability to alter the timing of sessions to accommodate an individual), which may lead to higher attrition and reduced cost-effectiveness.

As far as limitations, much of the data presented herein relied on self-report; participants may be responding to experimenter demands or the content of treatment (e.g., MAGT patients may report increased mindfulness because they were exposed to this concept in the group). Second, there was significant attrition in the present study (30% for MAGT, 40% for CBGT), and the follow-up data may have been particularly affected by attrition bias with only about half of patients providing follow-up data. However, the attrition at posttreatment is similar to other studies (e.g., Forman, Herbert, Moitra, Yeomans, & Geller, 2007) and the most common reason for discontinuing treatment was time commitment. The groups took place in the evening (starting at 5pm or 7pm) in the core of a

large city resulting in significant travel time to attend the sessions for some participants. Further, although therapy was provided free of charge, participants were not paid for their participation nor reimbursed for travel expenses. As such, the attrition in the present study was reasonable.

Third, regarding possible therapist effects, therapist adherence was assessed by adherence to agenda items, not specific therapy elements; as such, there may have been contamination from one treatment to the other or inadequate adherence to treatment elements that were not detected. In the same vein, therapist competence was not assessed, and therapist allegiance should be acknowledged. As the developers of MAGT, the therapists may have inadvertently delivered MAGT with more enthusiasm and competence than CBGT. Another possibility is that the therapists' training in mindfulness-based interventions contributed to their use of a more accepting therapeutic stance than is typically used in CBGT, which may have contributed to the increases in acceptance in that condition. Multiple therapists with allegiances to each treatment in a multisite design with a larger sample would have been preferable.

With respect to the generalizability of these findings, it should be highlighted that this was a fairly educated sample and current MDD was excluded (20% of those screened). It was standard practice at the clinic where the pilot work was conducted to reroute patients with comorbid MDD to the depression clinic (followed by treatment for SAD if necessary). For that reason, MDD was an exclusion criterion for our pilot study (and hence for this study), as it has been for others (e.g., Goldin et al., 2012). However, the BDI scores indicate that this sample was certainly not free of depressive symptoms. Future research should examine how MAGT fares for patients with comorbid MDD, given that is a very common presentation. Other indicators suggest this sample possesses good external validity, including the diverse age range, fairly even gender split, and that the composition was very similar to the ethnic and religious make-up of the large multicultural city where the study was conducted (Statistics Canada, 2007a, 2007b).

Overall, at this stage of development, our findings suggest that MAGT is promising as an alternative to traditional CBGT, the most empirically supported group treatment for SAD. Positive directions for future research include examining which treatment works best for a particular individual, evaluating the relative contribution to outcome of specific treatment elements, and a thorough examination of treatment mediation.

Acknowledgments

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