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Acceptance-based exposure therapy for public speaking anxiety ☆

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ABSTRACT

Public speaking anxiety (PSA), diagnosed at clinical levels as social anxiety disorder, nongeneralized type, is associated with significant distress and impairment in a substantial portion of the population (Aderka et al., 2012). Empirically supported behavioral treatments for PSA generally include in vivo and/or simulated exposure, usually presented with some form of rationale or context (e.g., habituation). Newer acceptance-based therapies frame exposure as an opportunity to increase one's willingness to experience anxiety, while engaging in valued behaviors. The present study examined the acceptability, feasibility, and preliminary effectiveness of acceptance-based exposure treatment for PSA compared to standard habituation-based exposure in a clinical population. Treatment was delivered in a group format over 6 weekly sessions. Participants receiving acceptance-based exposure (ABE) were significantly more likely than those receiving habituation-based exposure (HAB) to achieve diagnostic remission by 6-week follow-up. Those in the ABE condition rated this intervention equally acceptable and credible compared to participants receiving the habituation-based approach, and improvement on other outcome measures was comparable across conditions. Participants in both groups demonstrated significant and equivalent improvement on measures of public-speaking-related cognitions, confidence, and social skills. Baseline levels of mindful awareness moderated change in public-speaking-related cognitions across conditions, and baseline defusion moderated change in state anxiety for the ABE condition only.

1. Introduction

Prevalence estimates for public speaking anxiety (PSA) range from 20% (Pollard & Henderson, 1988) to 85% (Motley, 1995) of the general population. A national survey study reported public speaking as the most common lifetime social fear, reported by approximately 21% of the sample (Ruscio, Brown, Sareen, Stein, & Kessler, 2008). At clinically significant levels, PSA is diagnosed as social anxiety disorder (SAD), non-generalized type (American Psychiatric Association, 2000); 5.9% of individuals will be diagnosed as non-generalized type (Furmark, Tillfors, Statin, Ekselius, & Fredrikson, 2000). PSA occurs in approximately 70.3% of SAD patients and in 6.5% as an isolated fear (Knappe et al., 2011). PSA is associated with lower incomes, higher rates of unemployment, and reduced likelihood of postsecondary education compared to the general population; samples also tend to report significant distress or interference with work, education, or social life as a result of substantial public speaking fears (Aderka et al., 2012).

Given that most people with generalized SAD experience PSA, the SAD literature informs the treatment of PSA as a non-generalized SAD subtype. Current evidence-based, non-pharmacologic treatments for SAD/PSA highlight exposure to anxiety-provoking speaking contexts as the central component of treatment. Meta-analyses of studies examining treatments for SAD have found large pre-to-post-treatment effect sizes for exposure (Acarturk, Cuijpers, van Straten, & de Graaf, 2009; Edwards, 2011; Feske & Chambless, 1995; Gould, Buckminster, Pollack, Otto, & Yap, 1997; Taylor, 1996). Such exposure is typically conducted by means of both simulated role-playing and in vivo exercises (Heimberg & Becker, 2002; Herbert & Cardaciotto, 2005).

Although much can be learned about the treatment of PSA from general SAD research, sufficient differences exist between generalized and non-generalized SAD to justify studying PSA separately. Compared with generalized SAD, those with PSA alone tend to have later age of onset, less avoidance, higher rates of recovery, lower rates of comorbidity, less impairment, and are more likely to receive treatment (Ruscio et al., 2008). On speech tasks, those with PSA alone demonstrate a sharper initial heart rate increase and faster return to baseline heart rate compared

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with generalized SAD individuals (e.g., Hofmann, Newman, Ehlers, & Roth, 1995). A meta-analysis focusing specifically on PSA treatments found that exposure (without other treatment components) improved pre-to-post-treatment scores on self-report measures (Allen, Hunter, & Donohue, 1989). Other PSA-specific studies have found that exposure produces improvements on observer/clinician ratings of speaking behavior (Ayres et al., 1993; Hofmann, 2006; Newman, Hofmann, Trabert, Roth, & Taylor, 1994). Although exposure appears to be an effective treatment for PSA as well as generalized SAD, researching and treating these groups separately allows for more homogenous therapy groups and thus maximizes opportunities for appropriate treatment (e.g., relevant exposure exercises).

There is preliminary evidence that the way in which exposure is framed can affect treatment outcome. Southworth and Kirsch (1988) found that agoraphobic individuals participating in exposure exercises improved more on behavioral measures when told that the exposure was for the purpose of treatment (high expectancy) versus assessment (low expectancy). In clinical practice, exposure is always presented in the context of some rationale, usually either a habituation model of anxiety reduction (e.g., Salkovskis, Clark, Hackmann, Wells, & Gelder, 1999) or a cognitive modification model (e.g., Hope, Heimberg, & Bruch, 1995). Research comparing the relative efficacy of the habituation and cognitive restructuring rationales (presented in equivalent detail and length) has been inconclusive (Salkovskis, Hackmann, Wells, Gelder, & Clark, 2007).

In models of cognitive behavior therapy that stress psychological acceptance, such as Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999), exposure is typically used as a tool for increasing one's willingness to experience anxiety while simultaneously pursuing behavioral goals derived from core life values, rather than as a means of reducing anxiety per se (Orsillo, Roemer, Block-Lerner, LeJeune, & Herbert, 2004). Acceptance of distressing anxiety-related thoughts and feelings is accomplished in part by fostering a nonjudgmental "observer" perspective with regard to these experiences, a concept referred to as "defusion" in the ACT model (Hayes et al., 1999).

Published research on ACT for social anxiety is limited but promising. Dalrymple and Herbert (2007) found that ACT-based exposure treatment produced significant improvement in symptoms and quality of life, as well as in measures of ACT theoretical processes, in a clinical sample ($N=19$) with generalized SAD. In an uncontrolled pilot study, Ossman, Wilson, Storaasli, and McNeill (2006) reported similar results for a 10-session ACT-based exposure group treatment for SAD. Kocovski, Fleming, and Rector (2009) conducted an open trial of Mindfulness and Acceptance-Based Group Therapy (MAGT) for SAD. They reported reductions in social anxiety, depression, and rumination, and concomitant increases in mindfulness and acceptance.

However, very little published research to date has investigated the efficacy of ACT specifically for PSA. Block and Wulfert (2000) semi-randomly assigned undergraduates ($N=11$) with PSA (based on self-report measures) to four weekly sessions of group ACT, group cognitive therapy, or waitlist control. Both active treatment conditions made significant use of exposure exercises, framed within their respective treatment contexts. Measures of anxiety tended to decrease, whereas willingness ratings increased, in both active treatment conditions relative to placebo; however, the small sample size precluded statistical analyses, especially of possible between-conditions differences. In an extension of this study incorporating a larger sample of undergraduates ($N=39$) and 6 weeks of treatment, only the ACT participants, and not the cognitive therapy group, significantly increased their speech length (i.e., decreased behavioral avoidance) relative to waitlist control, although both active treatment groups showed decreased anxiety and increased willingness (Block, 2003).

There have been no published studies of acceptance-based exposure treatment in a clinical population with PSA. Therefore, the current study aimed to examine the feasibility, acceptability, and preliminary efficacy of an acceptance-based exposure treatment, compared to a standard habituation-based exposure treatment, for clinically significant PSA. It was hypothesized that participants in the acceptance-based condition would find the intervention highly acceptable, and that it would be found feasible by study therapists. Given promising results thus far for acceptance-based treatment approaches for anxiety, including PSA (e.g., Block, 2003), we further predicted that the acceptance-based group would experience a greater reduction in anxiety and behavioral avoidance compared to the habituation-based group. A secondary aim was to investigate possible moderating effects of baseline defusion and mindfulness on the effects of acceptance- and habituation-based exposure treatment, in order to identify potential characteristics that may facilitate or hinder response to these treatments.

2. Methods

2.1. Participants

Participants were 45 adults (36 females) with PSA meeting DSM-IV-TR criteria for nongeneralized SAD, based on a standard structured clinical interview. Participants were recruited from the Greater Philadelphia area through flyers posted throughout the community, online advertisements (e.g., Craigslist, FaceBook), email notices sent to local public speaking groups (i.e., Toastmasters), and announcements on the research lab's website. Additional recruitment efforts within the Drexel University community included several University-wide email announcements and notices in University bulletins.

Exclusion criteria included pervasive developmental disability, acute suicide potential, generalized SAD, psychotic disorders, and current substance dependence. Other comorbid Axis I diagnoses were acceptable only if clearly secondary to PSA. The majority of the sample was white (64.4%) and most were University students (75.6%). Mean age was 31.93 years (SD=10.55; range=19–63), and 46.7% were single (46.7% married/living with partner, 4.4% divorced, 2.2% declined to answer).

2.2. Measures

2.2.1. Outcome measures

Structured Clinical Interview for DSM-IV Axis I Disorders (*SCID*). The SCID (First, Spitzer, Gibbon, & Williams, 1996) is an extensively utilized structured diagnostic interview based on DSM-IV criteria. Estimates of interrater reliability range from moderate to high for most Axis I disorders (e.g., Williams et al., 1992; Zanarini & Frankenburg, 2001).

Personal Report of Confidence as a Speaker (*PRCS*)—*Short Form*. The PRCS-Short Form (Hook, Smith, & Valentiner, 2008) is a 12-item self-report measure of confidence in public speaking situations, with good internal consistency reliability, construct validity, and convergent validity with other public speaking measures. Cronbach's Alpha for the current study was .41.

Self-Statements During Public Speaking (*SSPS*). The SSPS (Hofmann & DiBartolo, 2000) is a 10-item, bi-dimensional self-report measure of positive (SSPS-P) and negative (SSPS-N) public-speaking-related cognitions. Across clinical and nonclinical samples, both subscales have shown good internal consistency, test–retest reliability, and

convergent validity (Hofmann, Moscovitch, Kim, & Taylor, 2004). Cronbach's Alpha for the current study was .34.

State-Trait Anxiety Inventory (*STAI*). The STAI (Spielberger, 1983) is a self-report measure of state and trait anxiety with high internal consistency and adequate convergent and discriminant validity. The current study used only the 10-item state scale, on which respondents rate their present-moment endorsement of anxiety-related statements. Cronbach's Alpha for the current study was .36.

Clinical Global Impression Scale (*CGI*). The CGI (National Institute of Mental Health, 1985) is a clinician-rated measure of global symptom severity (CGI-S) and improvement (CGI-I), rated on a 7-point scale. The SAD-specific CGI scales have demonstrated good interrater reliability and convergent validity (Zaider, Heimberg, Fresco, Schneier, & Liebowitz, 2003).

Behavioral Assessment Test (*BAT*). At pre- and post-treatment, participants completed a BAT consisting of an impromptu speech (up to 10 min) on an apparently randomly-chosen (but actually standardized) topic before a small confederate audience. Consistent with previous studies utilizing speech BATs (e.g., Hofmann et al., 2004), participants could end the speech either verbally or nonverbally (by using a "STOP" card). At various points during the BAT participants rated their anxiety on a 100-point Subjective Units of Discomfort Scale (SUDS; Wolpe & Lazarus, 1966). The videotaped BATs were evaluated by an independent assessor unaware of treatment condition and assessment point; a second assessor rated 30% of the speeches for reliability purposes. Using a coding system utilized in previous social anxiety research (Dalrymple & Herbert, 2007; Herbert et al., 2005), assessors rated perceived SUDS and evaluated (on a 5-point scale ranging from Poor to Excellent) quality of verbal, nonverbal, paralinguistic, and overall social skills. Interrater reliability was high (intraclass correlation $\alpha = .86$).

2.2.2. Process measures

Drexel Defusion Scale (*DDS*). The DDS (Forman, Herbert, & Moitra, 2008) is a unidimensional measure of cognitive defusion. Respondents read a definition of defusion and rate, on a 6-point scale, their ability to defuse from thoughts/feelings in 10 domains (e.g., anxiety). The DDS has demonstrated good internal consistency with both treatment-seeking ($\alpha = .80$) and non-clinical ($\alpha = .83$) samples, convergent validity with psychological acceptance, and divergent validity with psychopathology and experiential avoidance. Cronbach's Alpha for the current study was .78.

Philadelphia Mindfulness Scale (*PHLMS*). The PHLMS (Cardaciotto, Herbert, Forman, Moitra, & Farrow, 2008) is a 20-item self-report measure assessing the two key components of mindfulness: experiential awareness and psychological acceptance. It has demonstrated concurrent validity with other mindfulness measures. Each of the two subscales has shown high internal consistency across clinical and nonclinical samples, and the subscales have been found to be uncorrelated with one another, supporting the bi-dimensional nature of mindfulness. Cronbach's Alpha for the current study was .88.

Reaction to Treatment Questionnaire (*RTQ*). This study used a modified version (specific to PSA) of Holt and Heimberg's (1990) measure of treatment credibility and outcome expectancy. Respondents rated, on a 10-point scale, the credibility of the treatment, confidence that the treatment would reduce PSA, severity of PSA, and expected severity at various points after treatment. The RTQ has demonstrated high internal consistency, predictive validity, and negative correlations with social anxiety and functional impairment (Safren, Heimberg, & Juster, 1997). Cronbach's Alpha for the current study was .51.

2.3. Procedure

Potential participants ($N = 132$) underwent a 15-min telephone screening to receive information about the study and provide a preliminary assessment of eligibility. The majority of the individuals excluded on the basis of the phone screen reported clinically significant fears in social situations other than public speaking, suggesting more generalized social anxiety. These individuals were offered a referral to the Drexel University Social Anxiety Treatment Program or other appropriate community resource. A few others reported significant symptoms of other disorders (e.g., depression) and were referred elsewhere, or could not participate due to scheduling constraints. The remaining individuals ($n = 70$) underwent an in-person diagnostic interview (SCID) after providing informed consent. Diagnosticians (who were blind to eventual assignment to condition) were graduate psychology students trained and supervised by the second author, a licensed clinical psychologist. For training and reliability purposes, a portion of the diagnostic assessments were conducted jointly by two diagnosticians (one of whom was an advanced graduate student); the assessments of the two diagnosticians were then compared as a reliability check. All diagnostic evaluations were reviewed with one or both of the licensed clinical supervisors for the study (JDH and EMF) prior to enrolling participants. Diagnostic interrater reliability was greater than 80% for all assessments, and was 100% for participants enrolled in the study.

Following the diagnostic interview, 11 individuals were excluded due to ineligibility, and 14 refused to participate. The resulting 45 participants were randomly assigned to receive acceptance-based exposure (ABE; $n = 21$) or habituation-based exposure (HAB; $n = 24$). In order to attain relatively equal sample sizes across the two conditions given the varying number of participants (4–8) in each treatment cohort, a total of four HAB cohorts and three ABE cohorts were treated. Aside from one 4-person HAB cohort, the remaining cohorts in both conditions ranged from 6 to 8 participants. In order to account for the smaller "audience" size presented by the 4-person group, efforts were made to introduce additional confederates for role-plays whenever possible. Treatment consisted of six 2-h group sessions. Thirty-five participants (16 ABE, 19 HAB) completed treatment (i.e., attended at least three group sessions and completed at least part of the post-treatment measures).

At baseline, participants were assessed using all self-report, clinician-rated, and behavioral measures. The RTQ was completed at the conclusion of the first treatment session. Self-report measures were again completed at mid-treatment, post-treatment, and 6-week follow-up. The BAT was repeated at post-treatment, and clinician-rated measures were repeated at post-treatment and follow-up. Assessors remained blind to treatment condition throughout the data collection process.

2.4. Treatments

A total of three therapists (the first, fourth, and fifth authors, all graduate students trained and supervised by the second and third authors) provided treatment. All therapists provided both treatment modalities. Therapists participated in weekly supervision meetings with the second author, in addition to frequent peer supervision. Two therapists co-led each group; each therapist led at least two cohorts with each of the other therapists, to minimize experimenter effects. For both treatment conditions, Session 1 consisted of icebreaker activities and an explanation of the treatment rationale (either acceptance or habituation). In sessions 2–6, participants engaged in role-played exposure exercises, including both impromptu and prepared speeches and

performance activities, based on personalized fear hierarchies. The use of such hierarchies is standard practice in exposure treatment and research, including acceptance-based treatment of SAD (Dalrymple & Herbert, 2007). Following each session, participants were assigned out-of-session exposure tasks. Treatment manuals were developed for each of the two treatments (described briefly below).[1]

Exposure with Acceptance Rationale (*ABE*). Utilizing concepts derived from Acceptance and Commitment Therapy (Hayes et al., 1999), this treatment focused on accepting and defusing from one's distressing thoughts, feelings, and sensations while engaging in valued public speaking activities (exposure). The treatment was designed to promote "psychological flexibility," defined as "contacting the present moment fully" and "changing or persisting in behavior in the service of chosen values" (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). Techniques designed to foster acceptance and defusion, as well as mindfulness meditation, were presented and practiced before and during exposure exercises, and were assigned as homework between sessions.

Exposure with Habituation Rationale (*HAB*). This rationale for exposure utilized material from Salkovskis et al. (2007) habituation-based exposure therapy (HBET) condition, including classical and operant conditioning principles. PSA was presented as learned behavior that could be reduced through habituation as a result of exposure to feared situations. When engaging in exposure exercises (both in and out of session), participants were encouraged to remain in the feared speaking situation until their anxiety (i.e., SUDS rating) decreased. Self-monitoring and recording of SUDS levels were practiced in connection with in-session exposure exercises and assigned as between-session homework.

3. Results

The two treatment conditions were compared on demographic, outcome, and process variables using *t*-tests; no pre-existing differences were found. Data were inspected and tested to ensure that they met the assumptions of an analysis of variance (ANOVA) model (e.g., normal distribution, homogeneity of variance and covariance). No violations were found.

No between-groups differences were observed on overall treatment acceptability as measured by the RTQ (t (43)= −1.16, p=.25). Specific scores related to treatment credibility were also equivalent (t (43)=.16, p=.87). However, after hearing the rationales for their respective treatments, participants in the ABE condition expected their PSA following treatment to be slightly less severe compared to those receiving the HAB rationale (t (43)=2.14, p=.04, mean difference=3.11).

All data were analyzed using an intent-to-treat model (n=45). The multiple imputation method was used to address missing data (i.e., dropouts). No pre-existing differences were found between completers (n=35; 78%) and non-completers (n=10; 5 per condition) on either demographic variables or on baseline outcome and process measures. Descriptive statistics for all measures are displayed in Table 1; results of comparative analyses are displayed in Table 2.

At 6-week follow-up, none of the ABE participants (n=21) met diagnostic criteria for SAD; all had improved to either partial or full remission. In the HAB condition, 4 out of 24 participants (17%) still met diagnostic criteria at follow-up. A chi-square analysis revealed that this between-groups difference was significant (χ^2 (1, N=45)=3.84, p=.05). Participants who continued to meet diagnostic criteria did not differ from the rest of the sample on

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

Table 1
Descriptive statistics at Pre-Tx, Mid-Tx, Post-Tx, and 6-week follow-up.

Measures	ABE (n=21)		HAB (n=24)	
Tx Reaction (RTQ)	***M***	***SD***	***M***	***SD***
Tx credibility	45.14	6.04	45.42	5.44
Exp. severity	12.10	4.22	15.21	5.39
Total	66.05	8.03	63.21	8.35
Clinician-rated				
CGI-severity				
Pre-Tx	4.29	.46	4.29	.46
Post-Tx	2.16	.57	2.06	.69
Follow-up	1.70	.55	1.96	.82
CGI-improvement				
Post-Tx	2.07	.79	2.27	.69
Follow-up	1.78	.69	1.80	.76
Self-report				
PRCS				
Pre-Tx	2.33	1.65	2.58	1.38
Mid-Tx	3.12	2.28	4.23	2.73
Post-Tx	6.33	3.20	7.42	3.05
Follow-up	6.75	2.94	6.78	3.29
SSPS-positive				
Pre-Tx	14.71	4.10	15.28	4.35
Mid-Tx	17.58	3.32	16.75	4.24
Post-Tx	21.33	3.56	20.64	3.55
Follow-up	21.50	3.75	19.62	3.96
SSPS-negative				
Pre-Tx	17.81	5.02	18.39	5.23
Mid-Tx	15.52	4.43	15.61	4.80
Post-Tx	12.16	4.35	12.87	4.67
Follow-up	11.36	3.96	12.85	4.26
STAI				
Pre-Tx	33.27	9.58	32.79	10.20
Mid-Tx	35.12	10.52	36.00	9.98
Post-Tx	32.08	7.93	34.52	11.16
Follow-up	32.41	7.65	36.84	10.42
DDS				
Pre-Tx	32.81	6.92	33.00	7.55
Mid-Tx	34.54	7.45	34.87	5.29
Post-Tx	38.07	6.67	37.72	5.49
Follow-up	41.00	7.49	38.02	4.75
PHLMS-accept				
Pre-Tx	33.86	5.49	31.59	6.15
Mid-Tx	31.22	5.93	30.27	3.98
Post-Tx	33.06	4.73	32.82	6.18
Follow-up	34.90	4.52	32.72	5.18
PHLMS-aware				
Pre-Tx	34.81	6.52	33.29	5.54
Mid-Tx	35.67	5.56	34.49	4.83
Post-Tx	35.69	5.14	35.05	5.09
Follow-up	36.30	4.82	34.33	5.13
Behavioral				
Duration (s)				
Pre-Tx	152.19	152.55	147.50	129.85
Post-Tx	163.95	110.50	205.26	153.64
Baseline SUDS				
Pre-Tx	33.33	14.94	26.00	12.13
Post-Tx	24.90	10.80	20.58	7.46
Pre-BAT SUDS				
Pre-Tx	30.95	13.75	31.58	12.33
Post-Tx	26.38	10.78	22.16	6.89
Post-BAT SUDS				
Pre-Tx	50.24	22.67	57.08	19.16
Post-Tx	30.20	19.89	26.57	15.47
Highest SUDS				
Pre-Tx	64.67	16.01	68.58	15.25
Post-Tx	44.89	18.47	40.25	15.19
Overall SS				
Pre-Tx	2.24	.83	2.25	1.15
Post-Tx	2.81	.75	2.88	1.04
Verbal SS				
Pre-Tx	2.67	.91	2.50	1.18
Post-Tx	3.14	.85	3.33	1.20
Nonverbal SS				
Pre-Tx	2.10	.70	2.00	1.18

Table 1 (*continued*)

Measures	ABE ($n=21$)		HAB ($n=24$)	
Tx Reaction (RTQ)	***M***	***SD***	***M***	***SD***
Post-Tx	2.62	.74	2.79	1.06
Paralinguistic SS				
Pre-Tx	2.24	.83	2.21	1.02
Post-Tx	2.71	.75	2.75	.90
Observed SUDS				
Pre-Tx	60.81	18.35	65.62	22.69
Post-Tx	50.00	17.31	49.71	18.47

Table 2
Effects of time and treatment condition (intent-to-treat).

Measures	*Within-Ss effects (time)*		*Between-Ss effects (Tx condition)*		*Interaction (time × condition)*	
Clinician-rated	***F (2, 86)***	η_p^2	***F (1, 43)***	η_p^2	***F (2, 86)***	η_p^2
SCID	145.52***	.77	1.82	.04	.34	.01
CGI-S	314.57***	.88	.18	.004	1.40	.03
Self-Report	***F (2, 129)***	η_p^2	***F (1, 43)***	η_p^2	***F (3, 129)***	η_p^2
PRCS	57.60***	.57	1.01	.02	.92	.02
SSPS-Pos	48.27***	.53	.60	.01	1.49	.03
SSPS-Neg	36.08***	.46	.42	.01	.39	.01
STAI	1.07	.02	.71	.02	.85	.02
DDS	18.68***	.30	.21	.01	1.25	.03
PHLMS-aware	1.69	.04	.94	.02	.35	.01
PHLMS-accept	4.89**	.10	1.31	.03	.71	.02
Behavioral	***F (1, 43)***	η_p^2	***F (1, 43)***	η_p^2	***F (1, 43)***	η_p^2
BAT length (s)	3.65	.08	.24	.01	1.60	.04
Baseline SUDS	7.95**	.16	5.78*	.12	.38	.01
Pre-BAT SUDS	10.16**	.19	.51	.01	1.22	.03
Post-BAT SUDS	61.86***	.59	.11	.003	2.65	.06
Highest SUDS	62.58***	.59	.01	.001	1.98	.04
Verbal SS	15.13***	.26	.002	.001	1.13	.03
Nonverbal SS	16.28***	.28	.03	.001	.68	.02
Paraling. SS	11.04**	.20	.001	.001	.05	.001
Overall SS	13.06***	.23	.03	.001	.03	.001
Observed SUDS	15.59***	.27	.23	.01	.57	.01

* $p < .05$.
** $p < .01$.
*** $p < .001$.

self-report measures. The effects of time and treatment on outcome measures were assessed via a series of 2 (treatment condition) × 4 (assessment point) mixed model ANOVAs. Analyses revealed a significant main effect of time on clinician-rated severity on the CGI-S (F (2, 86)=314.57, $p < .001$, $\eta_p^2 = .88$). Likewise, significant improvement was observed on self-report measures related to public speaking (PRCS, SSPS) for both conditions from pre- to post-treatment; these gains were maintained at 6-week follow-up. Within-subjects effect sizes (η_p^2) for these measures ranged from .46 to .57 (F (2, 129)=36.08 to 57.60, all $p < .001$) (Table 3).

At all measurement points on the BAT, self-reported anxiety (SUDS) decreased across conditions from pre- to post-treatment (for highest SUDS, F (1, 43)=62.58, $p < .001$, $\eta_p^2 = .59$). Observer-rated social skills for the BAT improved significantly from pre- to post-treatment (for overall social skills, F (1, 43)=13.06, $p < .001$, $\eta_p^2 = .23$). Although not statistically significant, the pre-to-post increase in BAT duration approached significance (F (1, 43)=3.65, $p = .06$, $\eta_p^2 = .08$); in particular, the average BAT duration for the HAB condition increased by 57.76 s. A significant increase was observed for defusion (DDS; F (3, 129)=18.68, $p < .001$, $\eta_p^2 = .30$), and for mindful acceptance (PHLMS-Acceptance; F (3, 129)=4.89, $p < .01$, $\eta_p^2 = .10$). No significant between-groups differences or interactions were found on self-report measures.

Table 3
Correlation matrix of baseline measures.

Measure	SSPS-P	SSPS-N	STAI	PHLMS-Accept	PHLMS-Aware	DDS	Overall SS
PRCS	.09	−.28	.03	−.003	.01	−.09	.24
SSPS-P		−.**38***	−.01	.04	.09	.07	−.15
SSPS-N			**.38***	−.**32***	−.21	−.**45****	−.01
STAI				−.**45****	−.05	−.15	.04
PHLMS-Acceptance					−.22	.17	.06
PHLMS-Awareness						.24	.07
DDS							.10

* $p < .05$.
** $p < .01$.

To examine moderating effects of baseline levels of defusion and mindfulness on overall treatment response, a correlational analysis assessed the relationship between baseline measures of these variables and residualized change scores on outcome measures. For the overall sample, baseline mindful awareness was positively correlated with treatment gains on the SSPS-P from pre- to post-treatment ($r = .42$, $p < .01$) and from pre-treatment to follow-up ($r = .54$, $p < .001$). In the ABE condition only, baseline defusion (DDS) was correlated with degree of change in state anxiety (STAI) from pre-treatment to follow-up ($r = -.49$, $p = .02$). That is, higher baseline defusion was associated with a greater decrease in anxiety among participants receiving the acceptance rationale.

4. Discussion

The present study examined the acceptability and preliminary efficacy of a brief (6-session) acceptance-based group exposure treatment for PSA in a clinical population. Per intent-to-treat analyses and consistent with the study's hypotheses, the acceptance-based treatment was found to be more effective than exposure with a habituation rationale in helping participants achieve diagnostic remission by 6-week follow-up, and was rated by participants as equally acceptable and credible in comparison to the latter treatment. Across conditions, significant improvement was observed on self-reported confidence in public speaking, speech-related cognitions, and state anxiety, as well as observer-rated social skills on a behavioral speech task. Completion rates were comparable to other SAD/PSA treatment studies (e.g., Heimberg et al., 1998; McEvoy, Nathan, Rapee, & Campbell, 2012). Though not statistically significant, a large increase in speech task duration was observed from pre-to-post treatment, particularly for the HAB condition. Large effect sizes were observed across measures.

As hypothesized, baseline levels of facets of mindfulness and defusion moderated treatment response with respect to overall state anxiety and public-speaking-related cognitions. Specifically, higher scores on the Awareness subscale of the PHLMS at baseline was associated with increased positive self-statements related to public speaking. These results suggest that the ability to be mindfully aware of experience may enhance one's capacity to benefit from exposure treatment. Interestingly, greater baseline defusion predicted treatment-related decreases in state anxiety for the ABE condition only. As only the ABE participants were explicitly taught defusion strategies, it is possible that participants in this group who already had higher defusion skills were

better able to utilize specific defusion strategies once they were taught, thus decreasing overall anxiety. Given the preliminary nature of the study, these findings should be interpreted with caution, and are in need of replication.

Theoretically, the context in which exposure treatment is delivered could lead to differential effects either by altering expectations for treatment, or by targeting overt behavior (i.e., by altering participants' willingness to engage in exposure exercises). As noted above, participants in the ABE condition were significantly less likely than those receiving the HAB intervention to meet diagnostic criteria at follow-up. However, no other significant differences were found between the two treatment conditions on outcome or process measures. Although between-groups effect sizes were generally small, it is possible that the lack of significant findings on most measures could have been due to low statistical power. Given that the diagnostic measures were completed by independent assessors unaware of treatment condition, it is possible that the clinician-rated diagnostic measure may provide information independent of that which can be gathered from self-report measures. Another likely explanation for the lack of between-groups differences on self-report measures is that exposure-based treatment, regardless of the context in which it is delivered, is so powerful that it tends to produce change large enough to obscure any such differences. It is also possible that the in-session exposures were not difficult enough to result in differential levels of participation across conditions. A more heterogeneous sample, with a greater range of anxiety severity, might have produced more dramatic between-groups effects. For example, it is possible that individuals with more severe PSA may respond differently to exposure treatment depending on the rationale presented. In the same vein, a non-clinical, non-treatment-seeking population may yield differential results depending on treatment context, as was found by Block and Wulfert (2000). Measuring additional variables, such as physiological indicators of anxiety and defensive safety behaviors, might also have provided evidence for further differential effects.

Finally, mechanisms of action for the two treatment contexts may be more alike than different. Anecdotally, several participants in the habituation condition spontaneously reported using defusion and acceptance strategies. For example, one participant in the habituation condition stated that he came to "watch" his SUDS level decrease during public speaking exposure, but that he viewed this as separate from his behavior in the moment ("I can see my SUDS change over there, but I'm speaking over here"). The idea that individuals may come to use acceptance and defusion strategies during exposure, even when not explicitly taught to do so, is worthy of further investigation.

Limitations and future directions. This is the first study to examine the use of an acceptance-based exposure treatment in a clinical population with PSA. The most important limitation of the study is the small sample size, resulting in lower power for the statistical analyses. Although we attempted to address this issue via the examination of effect sizes, it remains possible that significant effects may have been missed due to insufficient power. A second potential limitation of the study concerns the issue of therapist allegiance to one treatment over the other; in the absence of specific assessments of allegiance, such an effect cannot be ruled out. Relatedly, the lack of treatment adherence and competency ratings is a limitation of the current study. Although previous research has demonstrated that SAD/PSA tends not to remit over time without treatment (e.g., Dalrymple & Herbert, 2007), a no-treatment control group would further address threats to internal validity (e.g., maturation).

Overall, the present pilot study demonstrated that an acceptance-based exposure intervention can be implemented feasibly in a group setting for the treatment of clinical PSA, and that such an intervention may be more effective than a more traditional habituation-based exposure treatment in reducing diagnostic criteria. Overall, both exposure treatments were quite effective in reducing PSA, suggesting that there is room for flexibility in the way that exposure is framed. A potential advantage of an acceptance rationale is that there is less emphasis on anxiety reduction, such that improvement (e.g., increased engagement in valued behavior) can be observed even in the absence of a large decrease in anxiety. Furthermore, some participants may respond more readily to an acceptance-based rationale for exposure as opposed to a habituation rationale.

Finally, the question remains as to whether or not a rationale for exposure is truly necessary. Although it may be difficult to convince individuals to engage in exposure without an explanation, there may be particular populations who respond best simply to being told what to do (e.g., certain military veterans who are accustomed to taking orders). Further research is needed to elucidate the most effective context for exposure treatment for a given individual. More broadly, future research should focus on examining mechanisms of action for exposure treatment, both for PSA and for other disorders in which exposure is a major therapeutic component.

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