

**ONLINE ATTENTION
MODIFICATION FOR SOCIAL
ANXIETY DISORDER:
A RANDOMIZED
CONTROLLED TRIAL**

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BACKGROUND

Cognitive behavioral models of social anxiety disorder (SAD) posit a critical role of vigilance to social threat.

Individuals with SAD may be faster to engage with and attend longer to social threat cues (e.g., emotional faces; Asmundson & Stein, 1994; Lee & Telch, 2008).

SAD is associated with biases in interpretation, attention, and imagery that may maintain symptoms (Hirsch & Clark, 2004).

BACKGROUND

Dot-probe protocol can identify cognitive biases in anxious individuals.

Stimuli are presented one above the other for ~500 ms, followed by a probe (●) that replaces one of the stimuli.

Participants indicate the probe location (e.g., top/bottom) as quickly as possible.

Chair

+

Spider



BACKGROUND

Participants with significant anxiety should respond faster on congruent than incongruent trials (Koster, Fox, & MacLeod, 2009):

- **Congruent trial** – Probe replaces threatening stimulus
- **Incongruent trial** – Probe replaces neutral stimulus

Adaptation of the protocol for treatment:

- **Attention Modification Condition (AMC)** – Probes consistently replace neutral stimuli. Thought to retrain attentional biases away from threatening stimuli, reducing symptoms (Koster et al., 2009).
- **Attention Control Condition (ACC)** – Probes replace neutral and threat stimuli with equal frequency.

Stupid

+

Ladder

+



BACKGROUND

Mixed evidence for the efficacy of attention modification protocols (Mogoase, David, & Koster, 2014).

- Large range of effect sizes for Internet studies (Hedge's $g = .05 - .97$) and for laboratory studies (Hedges $g = .02 - .82$)

More research needed on:

- Efficacy of Internet-delivered AMC compared to ACC
- Extended follow-ups (e.g., 4+ months)
- Use of alternative stimuli (e.g., words instead of faces)

BACKGROUND

Previous randomized controlled trial included a remote condition with idiosyncratically selected words with 4- and 8-month follow-ups (Carleton et al., 2015).

- Large reductions in SAD symptoms for AMC and ACC whether delivered in-lab or online
- No evidence of a relationship to attentional biases

Our study replicated and extended Carleton and colleagues, 2015 by:

1. Comparing the impact of AMC to ACC with idiosyncratic stimuli administered through the Internet with a larger sample
2. Assessing for changes in a broader range of constructs related to SAD

HYPOTHESES

- H_1** Participants completing either the AMC or the ACC were expected to report significant reductions in SAD symptoms and related constructs.
- H_2** No significant differences were expected in symptom or construct reductions between the AMC and the ACC.
- H_3** Maintenance of reductions in symptoms or constructs were expected at 4- and 8-month follow-ups.
- H_4** There would be no significant relationship between attentional biases and changes in SAD symptoms.

PARTICIPANTS

113 treatment-seeking community members:

- 33 men: $M_{\text{age}} = 39.94$, $SD = 12.93$
- 80 women: $M_{\text{age}} = 39.51$, $SD = 11.97$

Exclusion criteria:

- Suicidal intent
- Substance dependence (past 3 months)
- Current/past schizophrenia, bipolar disorder, current participation in psychotherapy, or medication changes (past 3 months or pending).

All met *DSM-IV-TR* diagnostic criteria for primary Social Anxiety Disorder.

PROCEDURE

SIPS Social Interaction Phobia Scale (Carleton et al., 2009)

SADS Social Avoidance and Distress Scale (Watson & Friend, 1969)

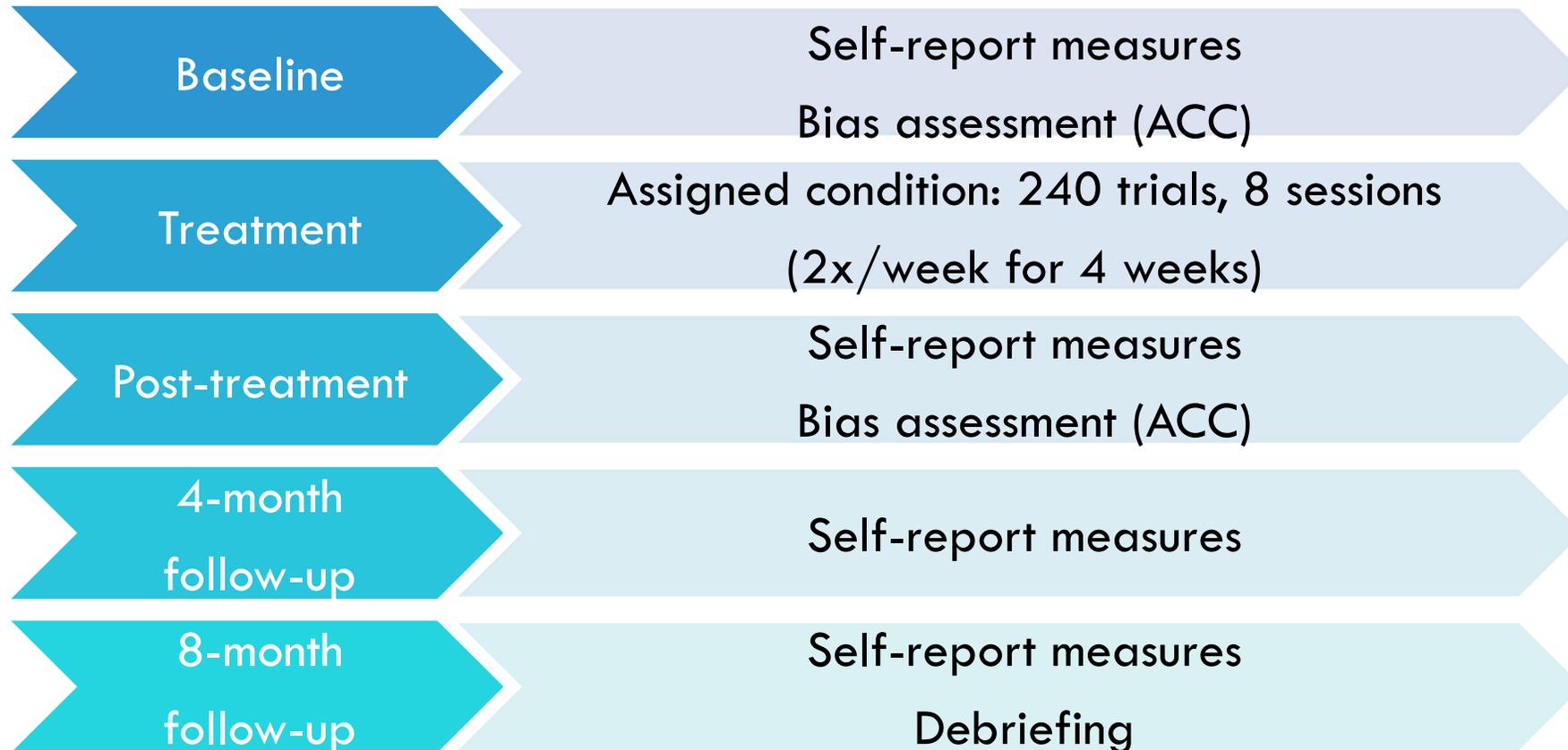
BFNE-S Brief Fear of Negative Evaluation scale, Straightforward items (Rodebaugh et al., 2004; Weeks et al., 2005)

FPES Fear of Positive Evaluation Scale (Weeks, Heimberg, & Rodebaugh, 2008)

STAI-T State-Trait Anxiety Inventory-Trait Scale (Spielberger, Gorsuch, Luschene, Vagg, & Jacobs, 1983)

CESD-14 Center for Epidemiologic Studies Depression Scale-14 (Carleton et al., 2013; Radloff, 1977)

PROCEDURE



PROCEDURE

Administration

- Inquisit 3 Web Edition from Millisecond Software

Stimuli

- 64 words relating fears relevant for SAD (e.g., *embarrassed, stupid*; Amir, Beard, Cobb, et al., 2009)
 - Rated by participants from very negative (-3) to very positive (+3).
 - 20 most negative words subsequently used as stimuli
- 64 neutral words matched for length (e.g., *ladder, roof*)

PROCEDURE

AMC

- 67% of the trials directed attention away from threat
- 33% of trials contained neutral words only

ACC

- 67% of the trials evenly directed attention towards or away from threat
- 33% of trials contained neutral words only

Inquired about participation ($n = 212$)

Declined to participate ($n = 73$)

Completed interview ($n = 139$)

Eligible and randomized ($n = 117$)

Participated with valid data ($n = 113$)

ACC ($n = 56$)

AMC ($n = 57$)

Lost to post-treatment ($n = 13$)
Lost to 4-month follow-up ($n = 5$)
Lost to 8-month follow-up ($n = 18$)

Lost to post-treatment ($n = 12$)
Lost to 4-month follow-up ($n = 7$)
Lost to 8-month follow-up ($n = 24$)

Completed ($n = 20$)

Completed ($n = 14$)

RESULTS – H_1

Self-report	Unstandardized betas		
	Time	Condition	Condition × time
SIPS	-0.74	0.33	0.34
SADS	-1.26	5.69	-0.02
FPES	-0.47	2.56	0.34
BFNE-S	-0.73	0.83	0.34
STAI-T	-0.62	4.30	0.22
CESD-14	-0.36	2.25	0.24

$p < .05$

Note. Time was coded in months. Condition was coded as 0 (ACC) or 1 (AMC).

RESULTS – H_1

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$p < .05$

Note. Time was coded in months. Condition was coded as 0 (ACC) or 1 (AMC).

RESULTS – H_2

Self-report	Unstandardized betas		
	Time	Condition	Condition × time
SIPS	-0.74	0.33	0.34
SADS	-1.26	5.69	-0.02
FPES	-0.47	2.56	0.34
BFNE-S	-0.73	0.83	0.34
STAI-T	-0.62	4.30	0.22
CESD-14	-0.36	2.25	0.24

$p < .05$

Note. Time was coded in months. Condition was coded as 0 (ACC) or 1 (AMC).

RESULTS – H_3

Effect sizes compared to baseline (Cohen's d)

ACC	Post-treatment	4 months	8 months
SIPS	0.89	0.52	0.74
SADS	0.64	0.58	0.51
FPES	0.31	0.09	0.17
BFNE-S	0.67	0.53	0.80
STAI-T	0.49	0.37	0.53
CESD-14	0.36	0.26	0.25
AMC			
SIPS	0.52	0.42	1.20
SADS	0.40	0.70	0.57
FPES	0.07	0.11	0.09
BFNE-S	0.29	0.37	0.48
STAI-T	0.21	0.22	0.49
CESD-14	0.18	0.00	0.48

Trivial
Small
Medium
Large

RESULTS – H_4

Magnitude of the change in bias from pre- to post-treatment should correlate with the magnitude of SAD symptom reduction.

ACC group – No significant correlations, as expected

- SIPS: $r = -.06, p = .72$
- SADS: $r = -.08, p = .59$

AMC group – Mixed results

- SIPS: $r = .11, p = .50$
- SADS: $r = .36, p = .02$
- No attentional bias at baseline

DISCUSSION

H ₁	Symptom/construct reductions in both groups	
H ₂	No difference in reductions between AMC and ACC	
H ₃	Reductions maintained at 4- and 8-month follow-ups	
H ₄	No relationship between attentional bias and symptom changes	 / 

DISCUSSION

Evidence for specific symptom type reductions (e.g., fear of negative evaluation, but not positive evaluation).

- No words related to positive evaluation (e.g., "applause")
- Protocol as exposure?

Results support research suggesting that symptom reductions can occur despite absent changes in attentional biases (e.g., Boettcher et al., 2012; Carleton et al., 2015; Heeren, Mogoase, McNally, et al., 2015).

Attentional control instead responsible for symptom change (Heeren, Mogoase, McNally, et al., 2015; Klumpp & Amir, 2010)?

LIMITATIONS AND FUTURE DIRECTIONS

Use of behavioural indicators in addition to self-reports

Waitlist control

Environmental conditions (e.g., distractions)

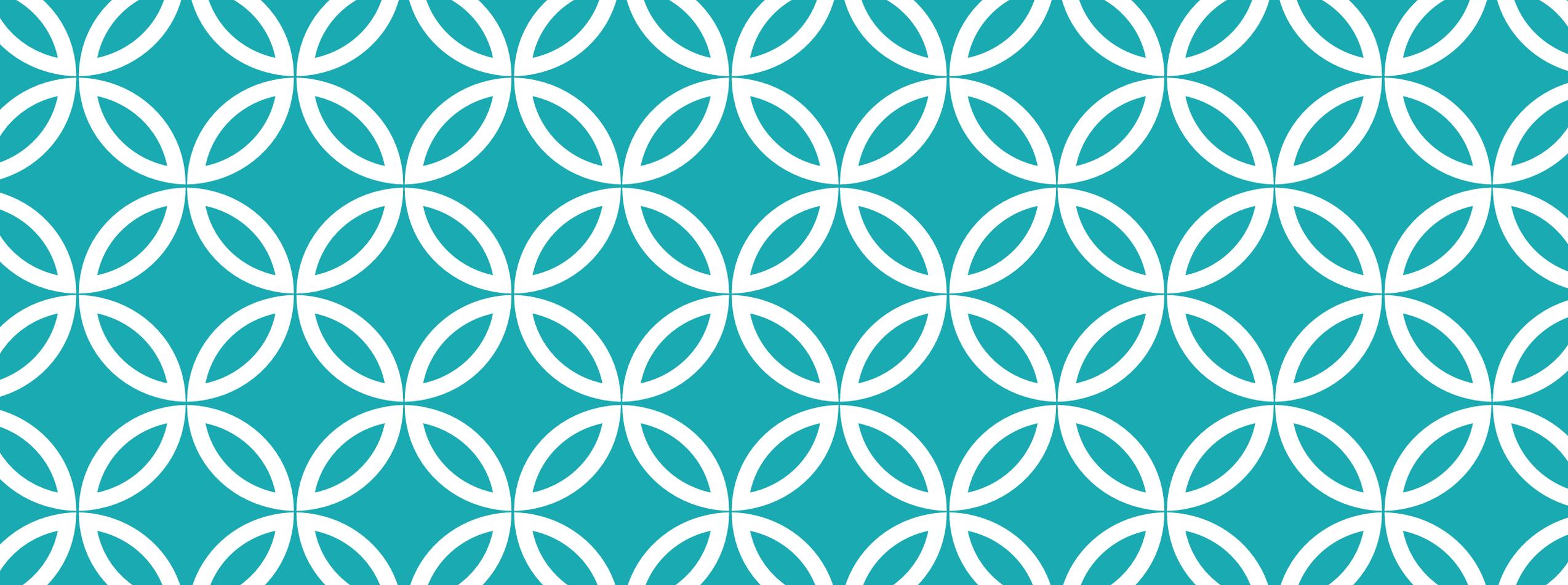
No idiosyncratic neutral words

CONCLUSIONS

Attention modification with idiosyncratic word stimuli and remote administration, irrespective of the condition was associated with reduction in symptoms and constructs related to SAD.

The reductions appeared unrelated to the presence of, or changes in, attention biases.

More emphasis must be placed on understanding the underlying mechanisms responsible for the disparate results reported in the current literature.



University
of Regina

THANK YOU!



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