

Modification of attention bias: A novel treatment for anxiety disorders

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in Clinical Psychology

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Introduction

- Information processing models of anxiety suggest that anxious individuals focus their attention on threat relevant information
- This attention bias may be one cause of anxiety
- Therefore, reduction of this bias should lead to reduction of anxiety

Reviews of studies of attention bias in anxiety using the probe detection task

- Mogg and Bradley (2005):
 - 10 studies showing that individuals with GAD have an attention bias for threat that is absent in non-anxious controls
- Bar-Haim, et al. (2007):
 - 172 studies (N = 2263 anxious, N = 1768 non-anxious) concluding that attention bias in anxiety is consistent and reliable

Goals

- Can we change this attention bias experimentally and examine the effect on anxiety?
- Can we use this intervention to increase access to treatment for anxiety disorders?

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E (left)

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Effect of attention training on anxiety

- Short term effects: Can attention training reduce response to a social stressor (e.g., public speaking challenge)
- Long term effects: Can attention training be used as an effective treatment for social anxiety disorder in a randomized clinical trial

Attention Tasks

- Session comprised 160 trials:
 - Probe type (E or F)
 - Probe position (Top or Bottom)
 - Emotion type (Threat or Neutral)
- Attention Modification program (AMP): Probe followed Neutral face on 80% of trials
- Attention Control condition (ACC): Probe followed Neutral and Threat faces with equal probability

Participants

- 105 socially anxious individuals
- Assigned randomly to either
 - Attention Modification Program (AMP, n = 51)
 - Attention Control Condition (ACC, n = 54)
- Design
 - 2 (Group: AMP vs. ACC) X
 - 3 (Anxiety: pre training, post training, post challenge)

Measures

➤ **Anxiety**

- Speiberger State Anxiety state Inventory
 - (STAI, Speiberger, 1983)

➤ **Faces**

- Standardized set of emotional expressions used in previous research on emotion
 - (Matsumoto & Ekman, 1989)

➤ **Behavioral Assessment Task**

- Speech

Procedure

- Completed self report questionnaires—State-Trait Anxiety Inventory (STAI)
- Computer tasks
 - Posner
 - Attention Modification Program (AMP)
or
 - Attention Control Program (ACC)
 - Posner
- Second STAI
- Give speech
- Third STAI



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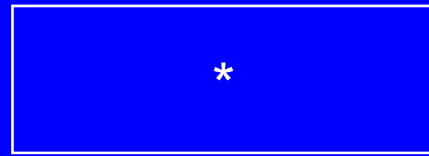


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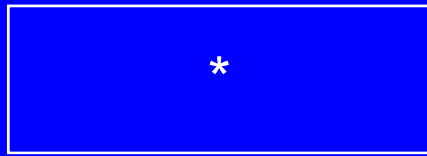
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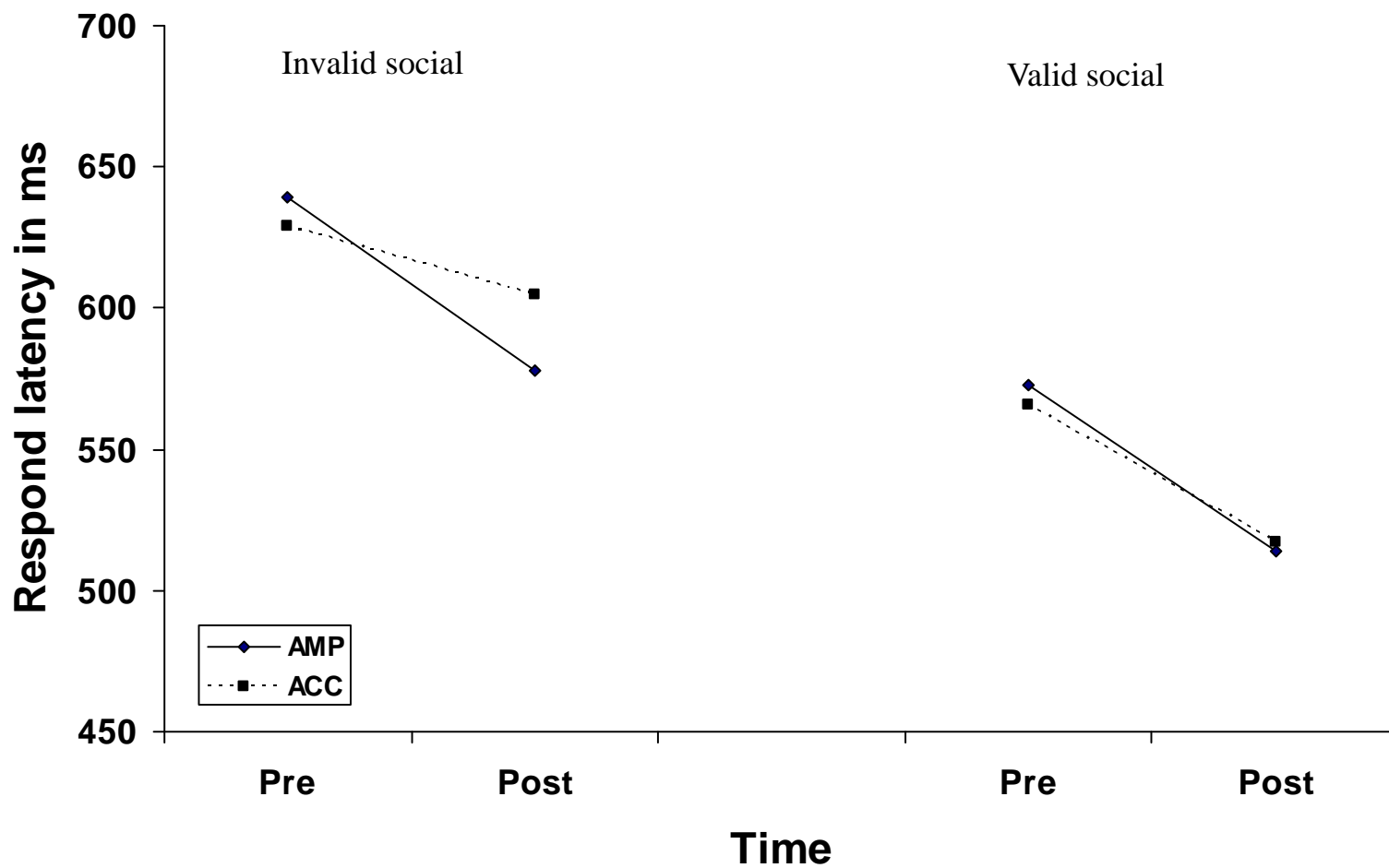
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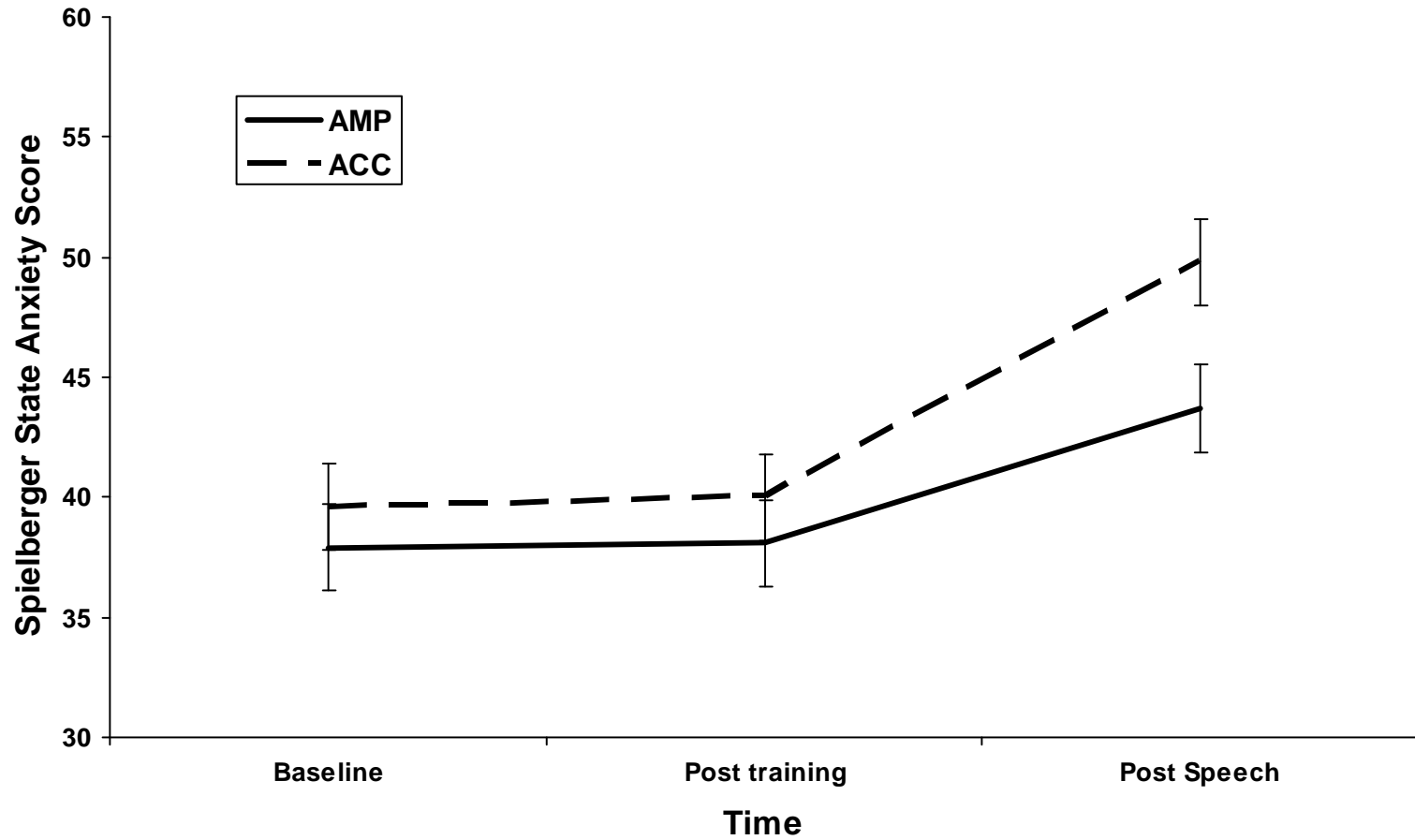
Behavioral Assessment Task

- **Told they would have to give a 5 minute speech**
 - Video recorded and rated by a graduate student for quality
- **Asked to choose a topic from list of 5 topics**
 - abortion, corporal punishment, seatbelt laws, nuclear power, and the American health system
- **Spent two minutes preparing**
 - taking notes but told could not use notes during speech
- **End of two minutes stood in front of the video camera**
 - Experimenter Stopped them after two minutes unless they stopped sooner

Response latencies on the Posner task before and after training

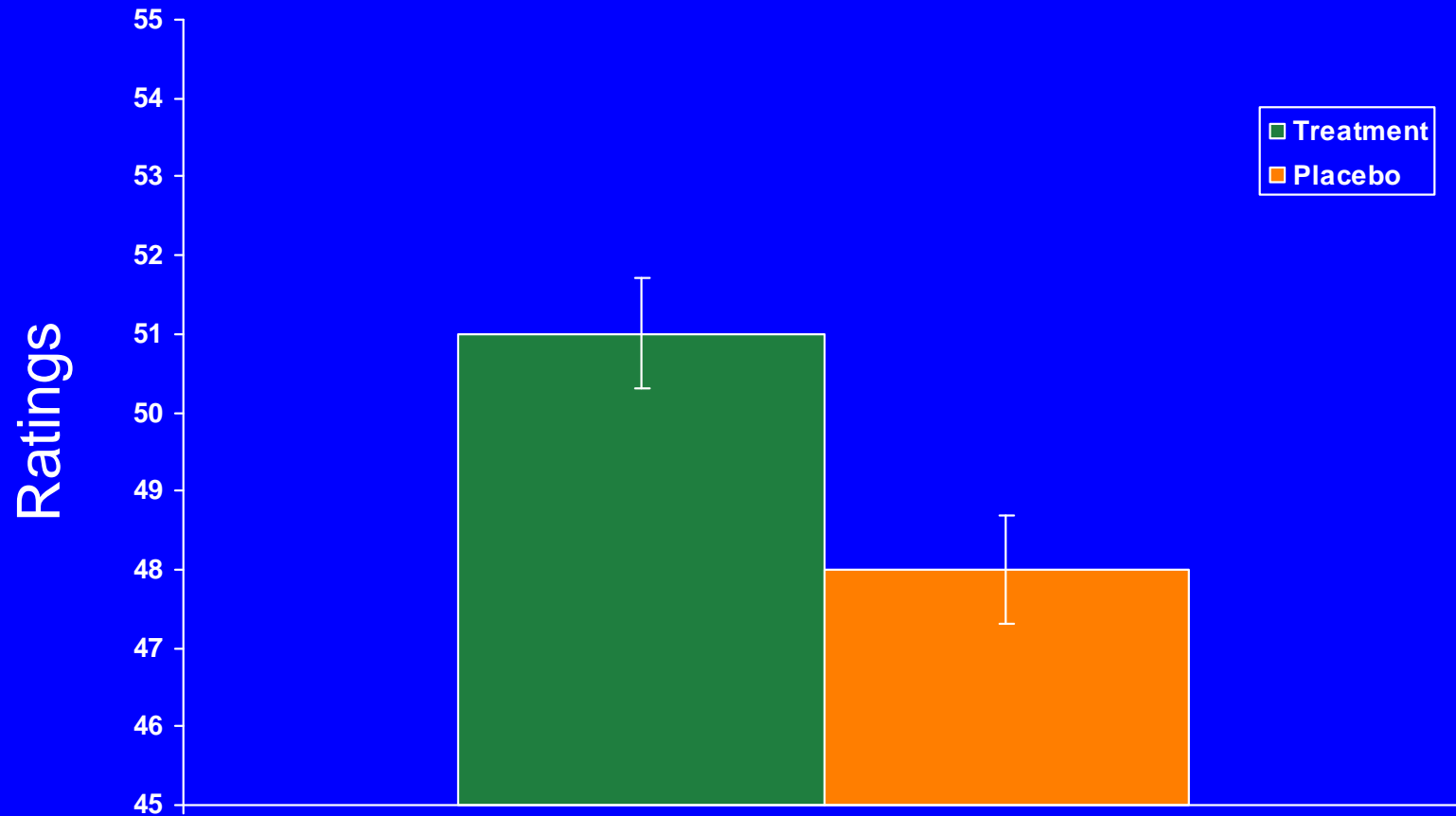


State anxiety scores in the AMP and the ACC groups (Bars indicate standard errors)



Independent Ratings:

Higher score = better speech



Mediation analyses

- Did AMP exerted its influence Through change in attention bias to threat?
- Used MacKinnon's procedure
 - MacKinnon, Fairchild, & Fritz, 2007; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002
- Tests the product of the coefficients

Mediation analyses

➤ Coefficients

- a) The independent variable (group: AMP, ACC) to the mediator (attention bias after training)
- b) The mediator to the dependent variable (change in state anxiety scores from pre- to post-speech; speech performance) when the independent variable is taken into account

Mediation analyses

- Variation on the Sobel (1982) test accounting for the non-normal distribution of the $\alpha\beta$ path
- 95% confidence intervals of the indirect path ($\alpha\beta$) did not overlap with zero
 - change in state anxiety
(lower limit = .015, upper limit = .203)
 - observer-rated speech performance
lower limit = .004, upper limit = .166

Effect of attention training on anxiety

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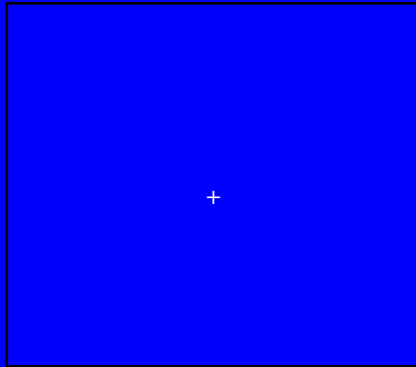
Treatment studies

- 3 studies in individuals meeting the DSM-IV diagnostic criteria for anxiety disorders
 - Individuals with social phobia
 - Replication in a different lab in individuals with social phobia
 - Individuals with GAD

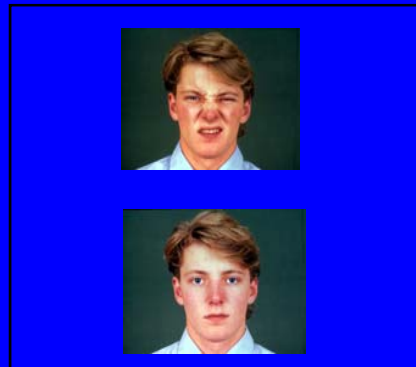
Study 1

Participants

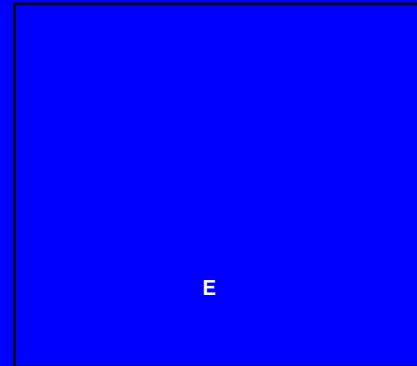
- 44 individuals meeting the DSM-IV diagnostic criteria for social phobia as primary diagnosis
- Told the study examined the efficacy of a computerized program designed to reduce people's levels of anxiety and that they would be assigned to either a treatment or a placebo condition



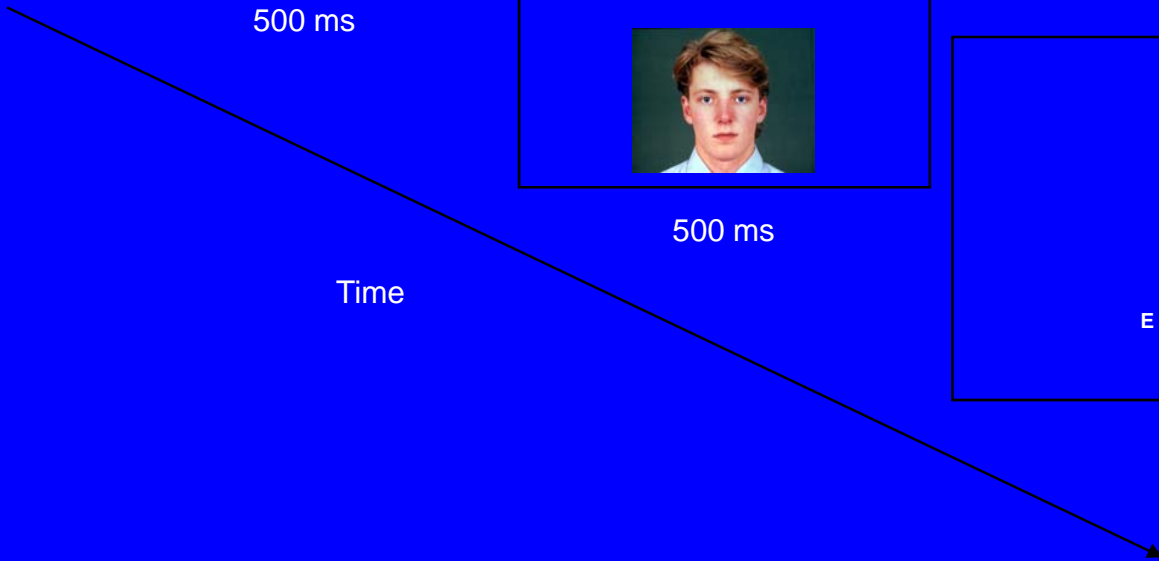
500 ms



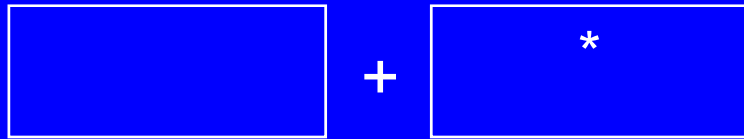
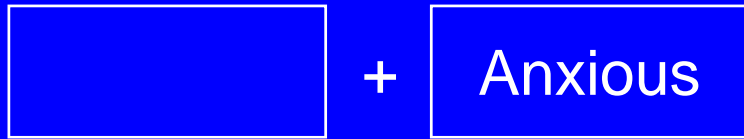
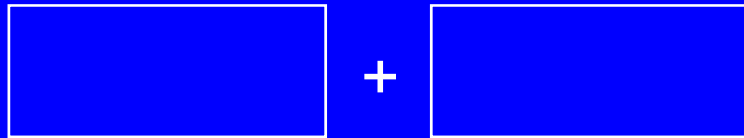
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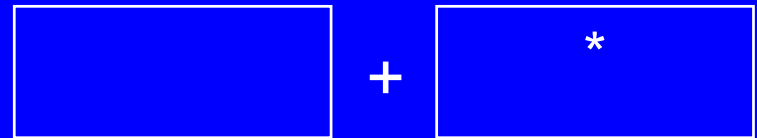
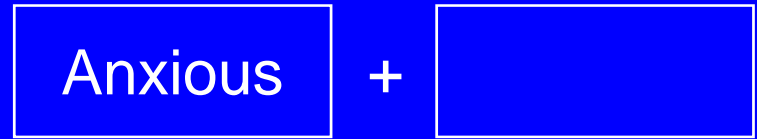
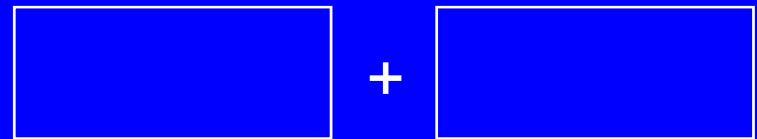
Time



Valid trial



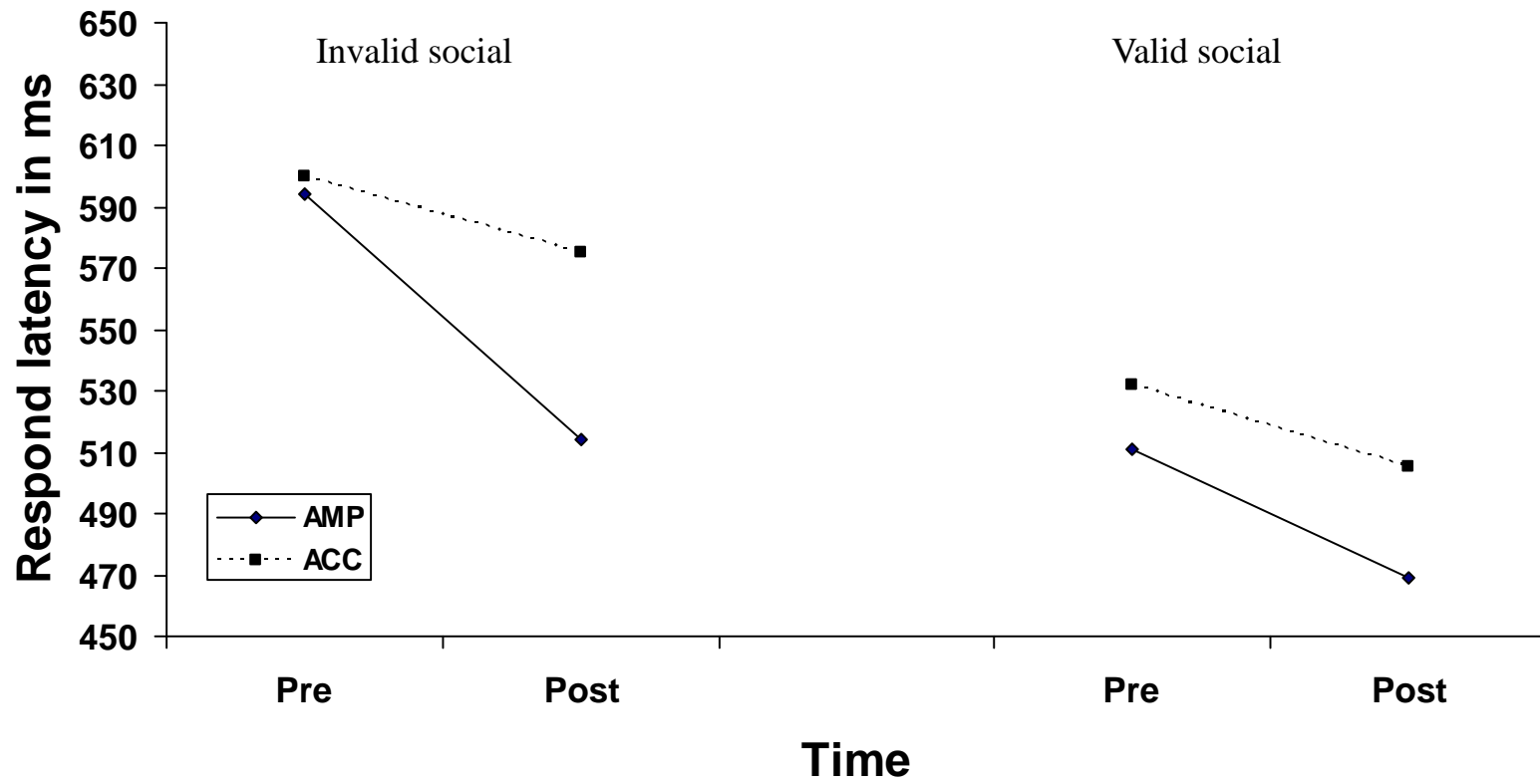
Invalid trial



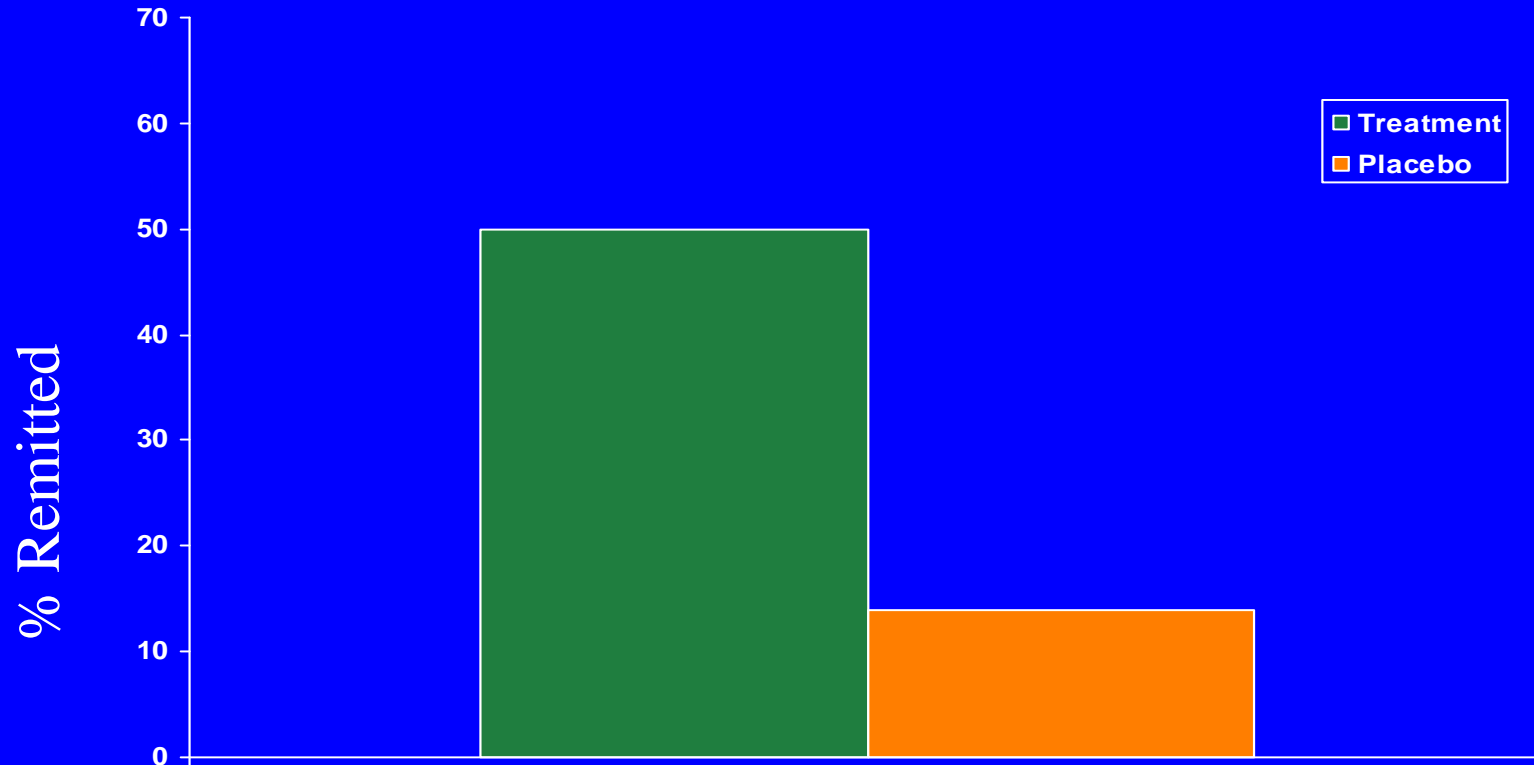
Attention Disengagement Task

- Training sessions twice a week for 4 weeks
- Participants randomly assigned to either AMP or ACC
- Participants and independent evaluators blind to condition

Response latencies on the Posner task before and after training



Percent participants remitted SCID-IV GSP diagnosis



Study 2

Study 2

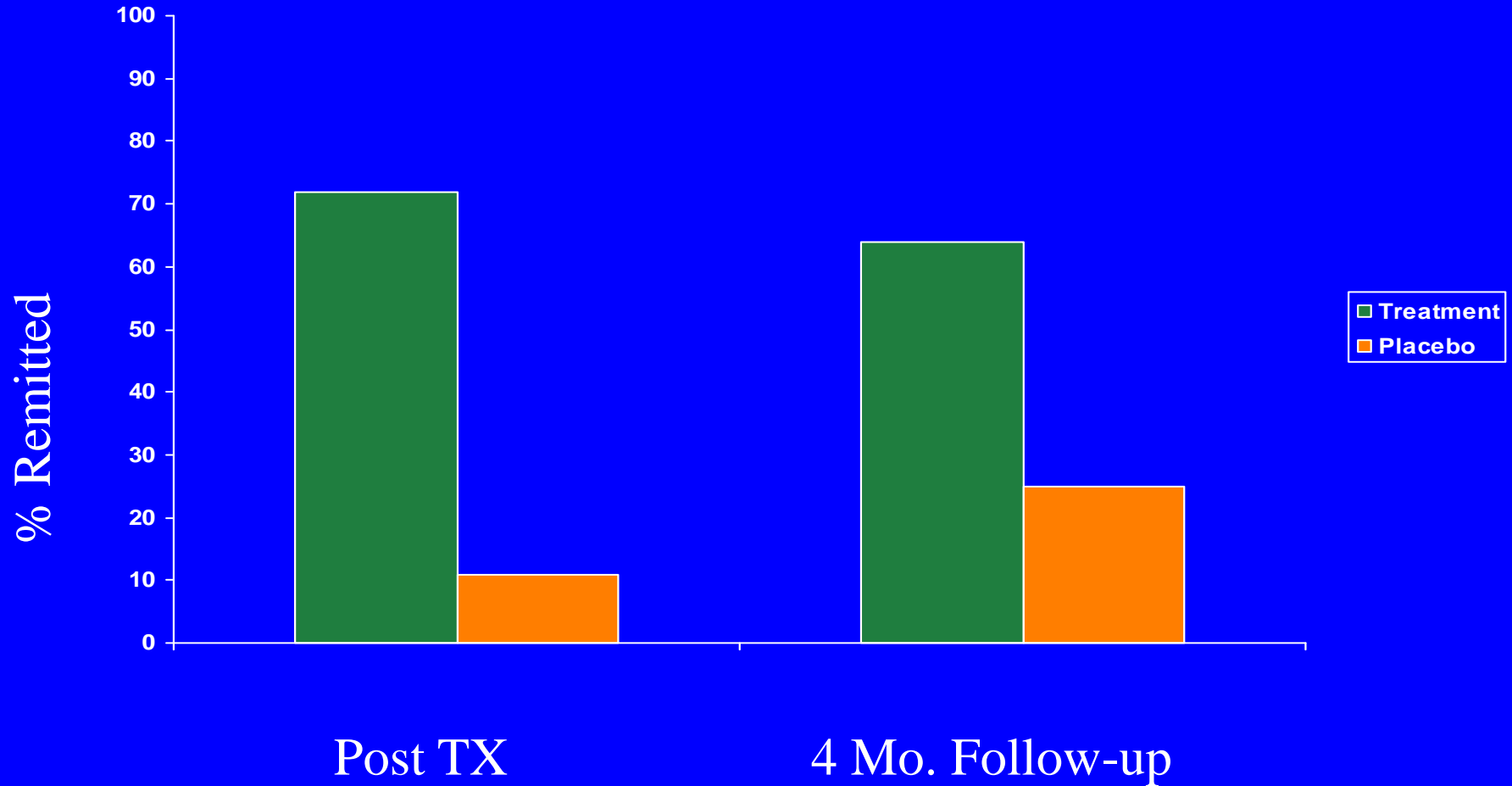
Are these effects transportable (i.e., replicable)?

Study done by Dr. Schmidt at Florida State University using the same program and same procedures

Participant Characteristics

- 36 participants
 - Community and FSU undergraduate participants screened using the FNE or SIAS
 - Those scoring at or above 75th percentile were further evaluated.
 - Structured Clinical Interviews (SCID-IV)
 - Diagnosis of Generalized SAD was required.

Percent participants remitted SCID-IV S.A.D. diagnosis



Study 3

Participants

29 treatment-seeking individuals meeting the diagnostic criteria for GAD

Used diagnostic interview using the Structured Clinical Interview for the DSM-IV (SCID; First, Spitzer, Gibbon, & Williams, 1994)

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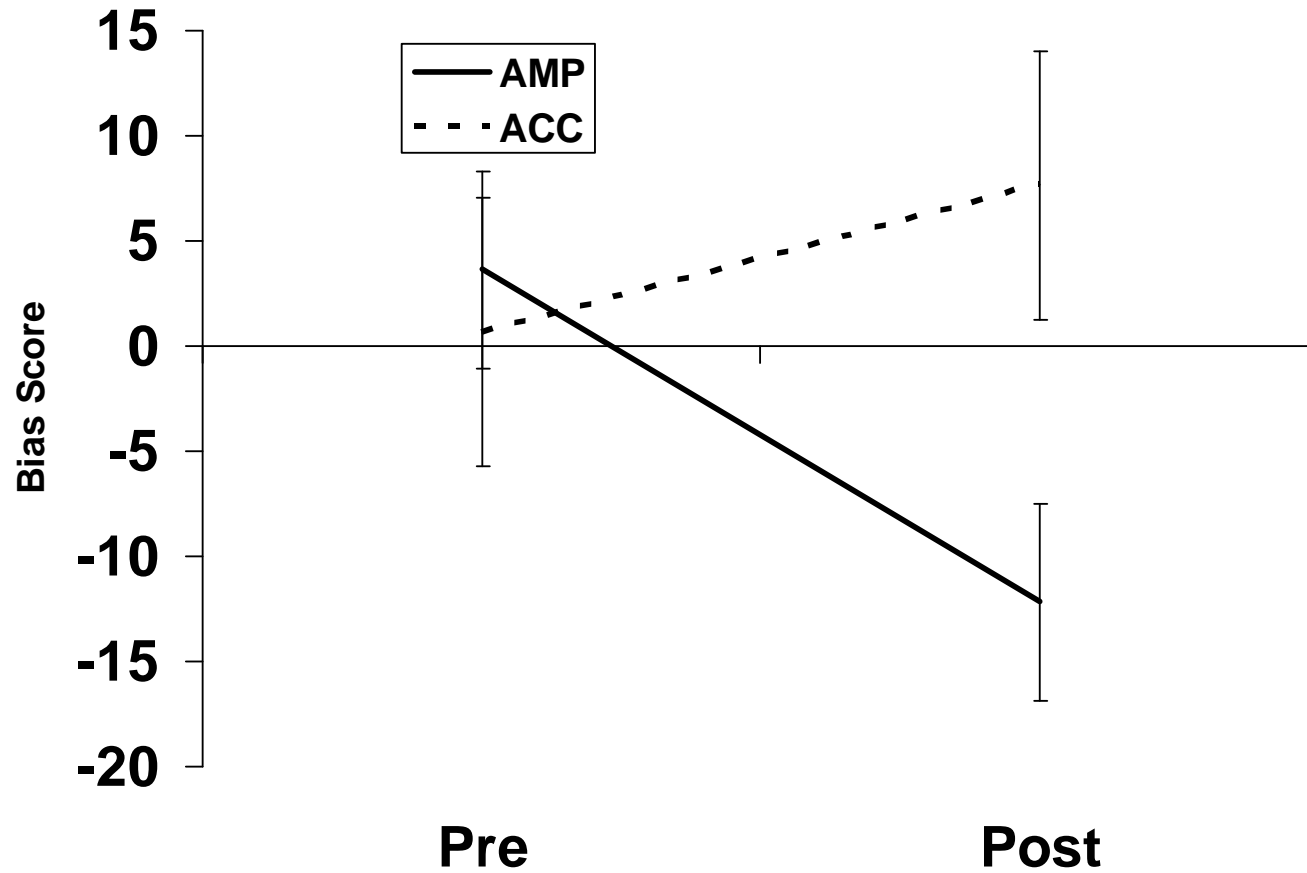
Anxious

Tables

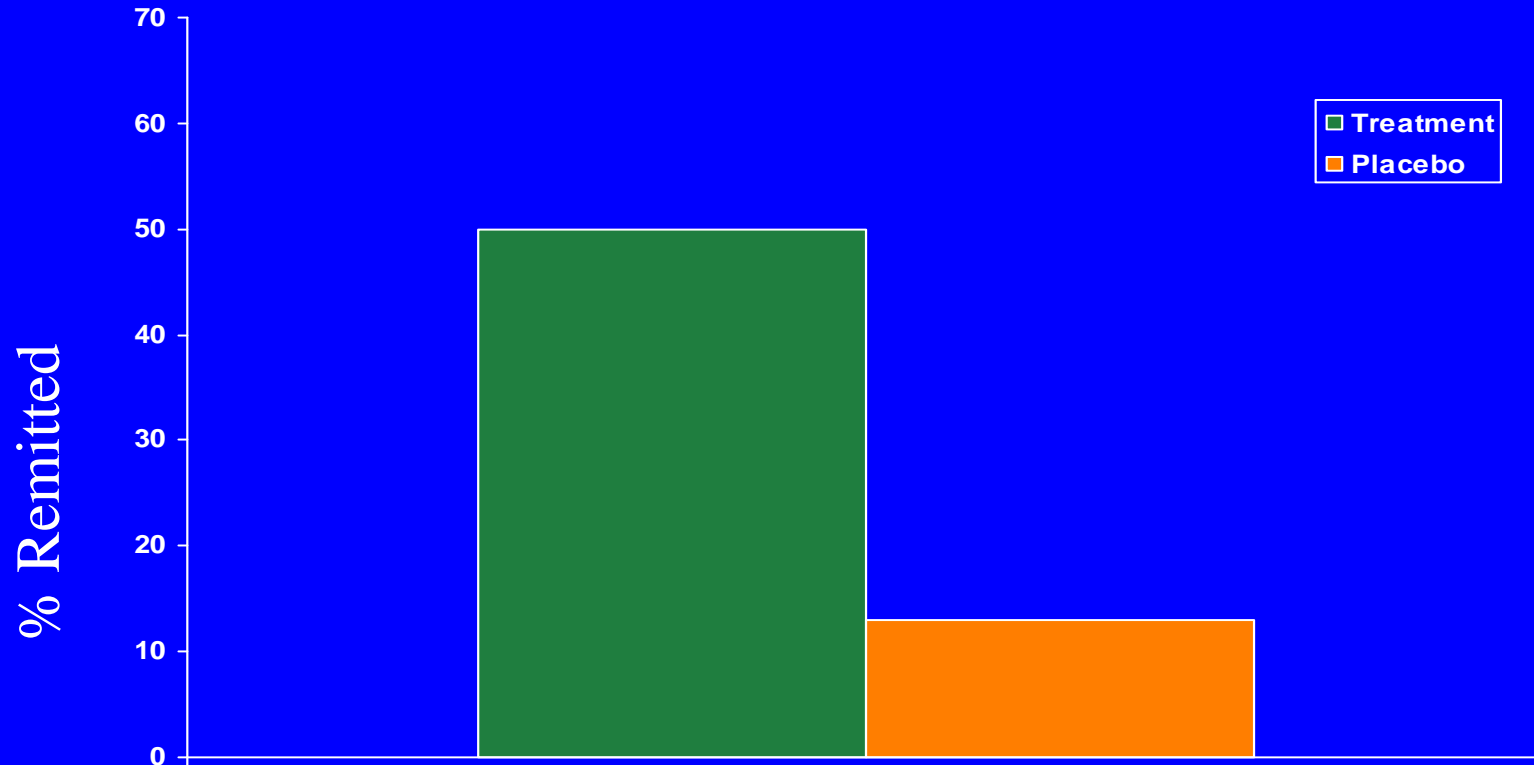
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Bias score on the probe detection task by group and time



Percent participants remitted SCID-IV GAD diagnosis



Discussion

- Reduction in attention bias may lead to change in anxiety symptoms
- “Real” clinical impact in individual with diagnosis of an anxiety disorder

Future directions

- Identify responders
 - Genes
 - Attention
 - HTTP
 - Those with malleable bias
- FMRI
 - Show that changes are theory consistent
 - Emotion regulation circuits in the brain
- Internet delivery

Thank you

Studies of attention bias in SP using faces and probe detection task

- Find bias for threat in SP (e.g., Mogg et al, 2002) but not always (e.g., Chen et al, 2002)
- Common features in studies showing bias (Bogels et al., 2004)
 - Used face pairs in the probe detection task
 - Presented faces quickly (i.e., < 500 ms)