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FNRS

Selective attention and emotional vulnerability in Social Phobia:

The experimental manipulation of attentional bias using a modified dot-probe task

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The dot-probe task

The dot-probe task

- also called probe detection task

- Origin: Posner, Snyder & Davidson (1980); Navon & Magalit (1983)

- For assess the allocation of attention using RT

- Faster responses for signals appearing in a location in which attention is allocated

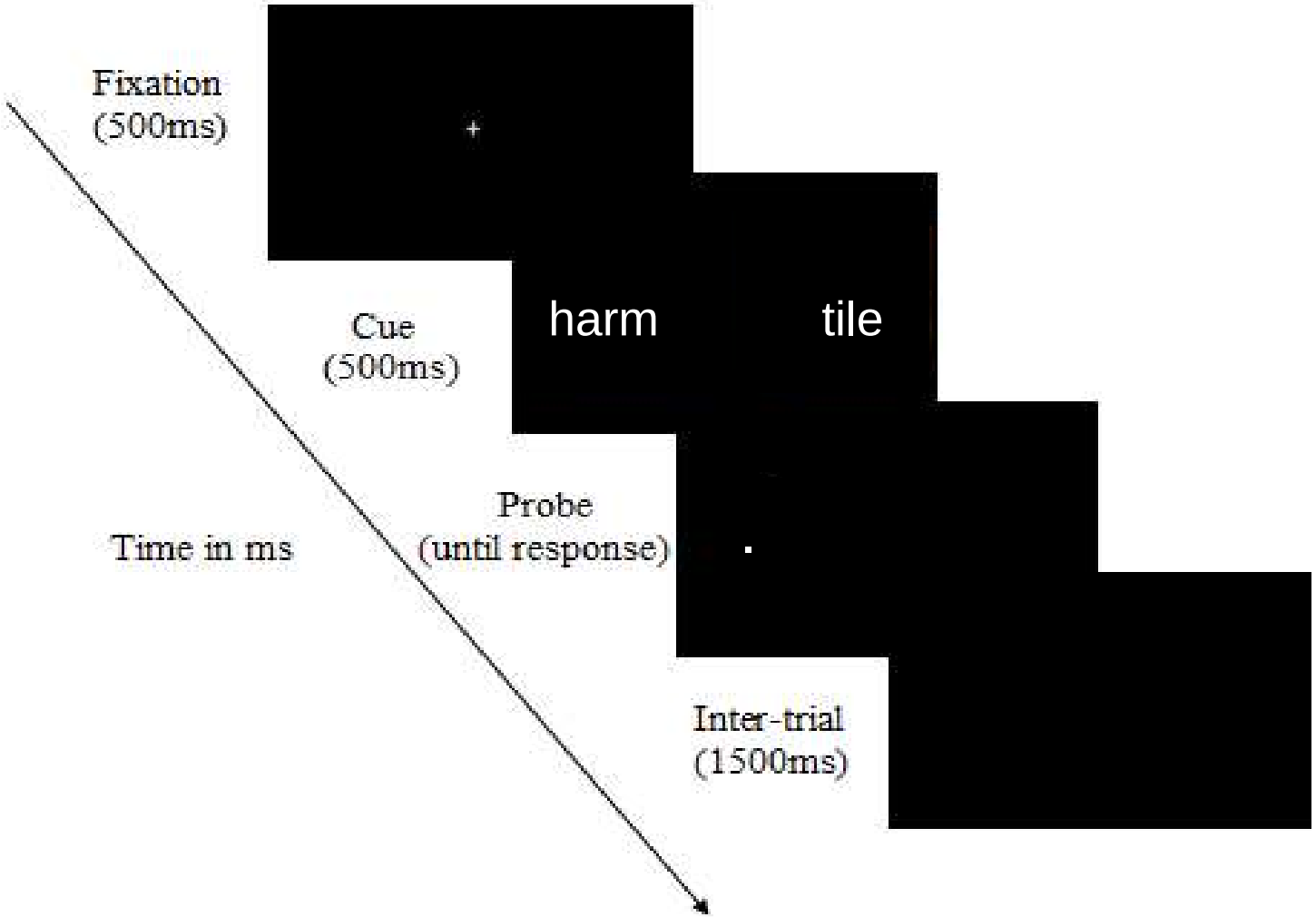
Adaptation for emotional stimuli

- MacLeod, Mathews, & Tata (1986)

- For assess the impact of threat-related stimuli on the distribution of visual attention among high-anxious

- High-anxious vs. healthy control

Based on MacLeod et al., (1986)



Adaptation for emotional stimuli

- Cues: 48 threatening words, each paired with a neutral word + 240 neutral pairs as filler material

- 48 X 2 (cue location) X 2 (probe location)

- Anxious: reduced detection latencies for probes appearing in the vicinity of threat words.

Adaptation for emotional stimuli

- A wealth of research, using the dot-probe task, has demonstrated attentional biases in anxiety disorders

- For a review, see Bar-Haim et al., 2007 and Cisler & Koster, 2010

Manipulating attention in Social Phobia

Attentional biases in Social Phobia

- Social phobia is characterized by

- *Automatic attentional capture by threatening information (e.g., angry; Mogg, Philippot, & Bradley, 2004)*

- *Difficulties in disengaging attention from socially threatening stimuli (e.g., Amir et al., 2003).*

- However, most of these studies were correlationally designed.

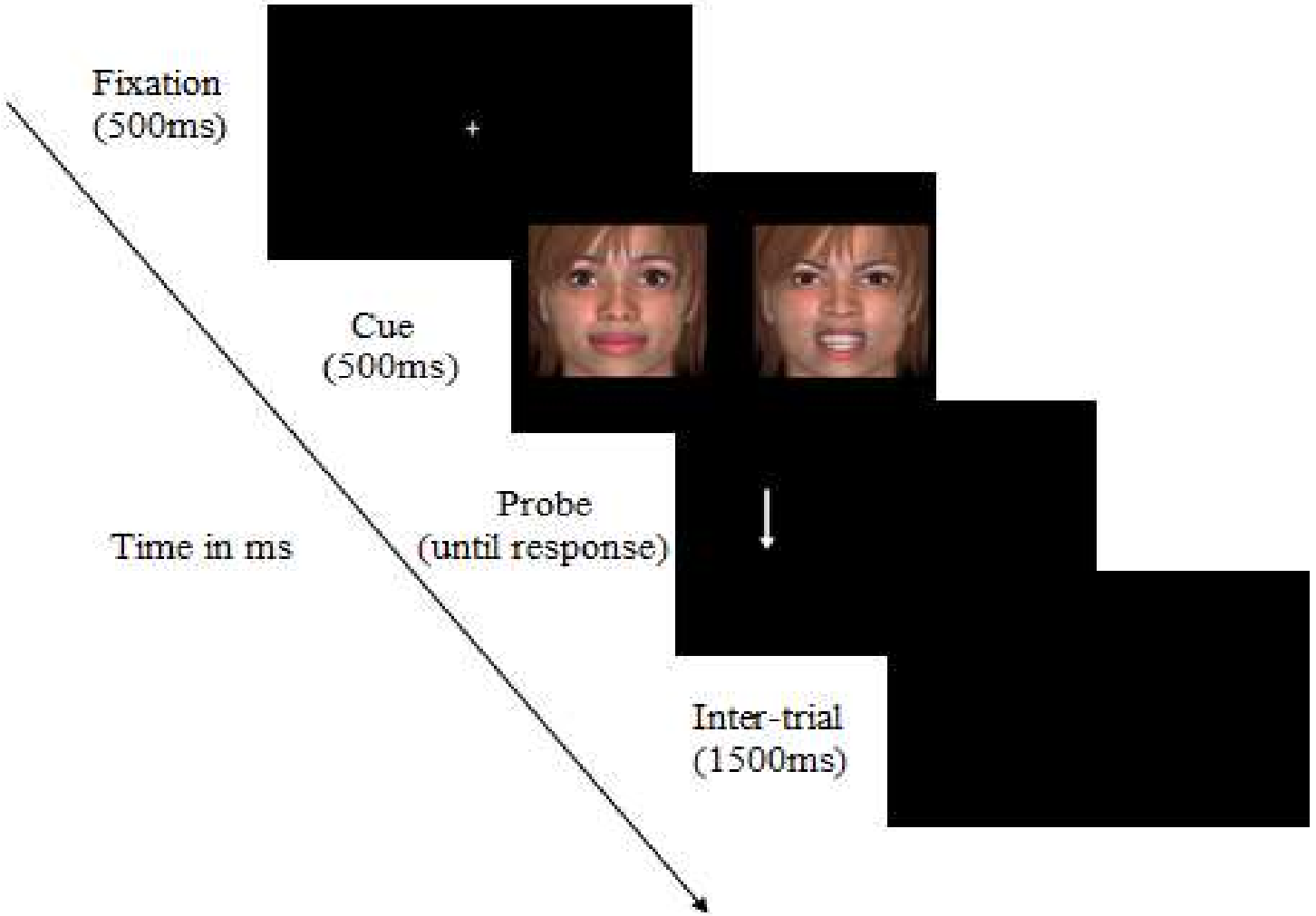
Attentional biases in Social Phobia

- According Amir et al. (2008, p. 861), conclusions regarding the causal role of attention bias in the maintenance of social anxiety can be made only from research designs in which

1. Participants are randomly assigned to conditions
2. And their attention is experimentally manipulated

- Training to attend to non-threatening stimuli is related to short-term (e.g., Amir et al., 2008) and long-term emotional changes (e.g., Schmidt et al., 2009).

Example of training trial



Amir et al. (2008) *JAP*

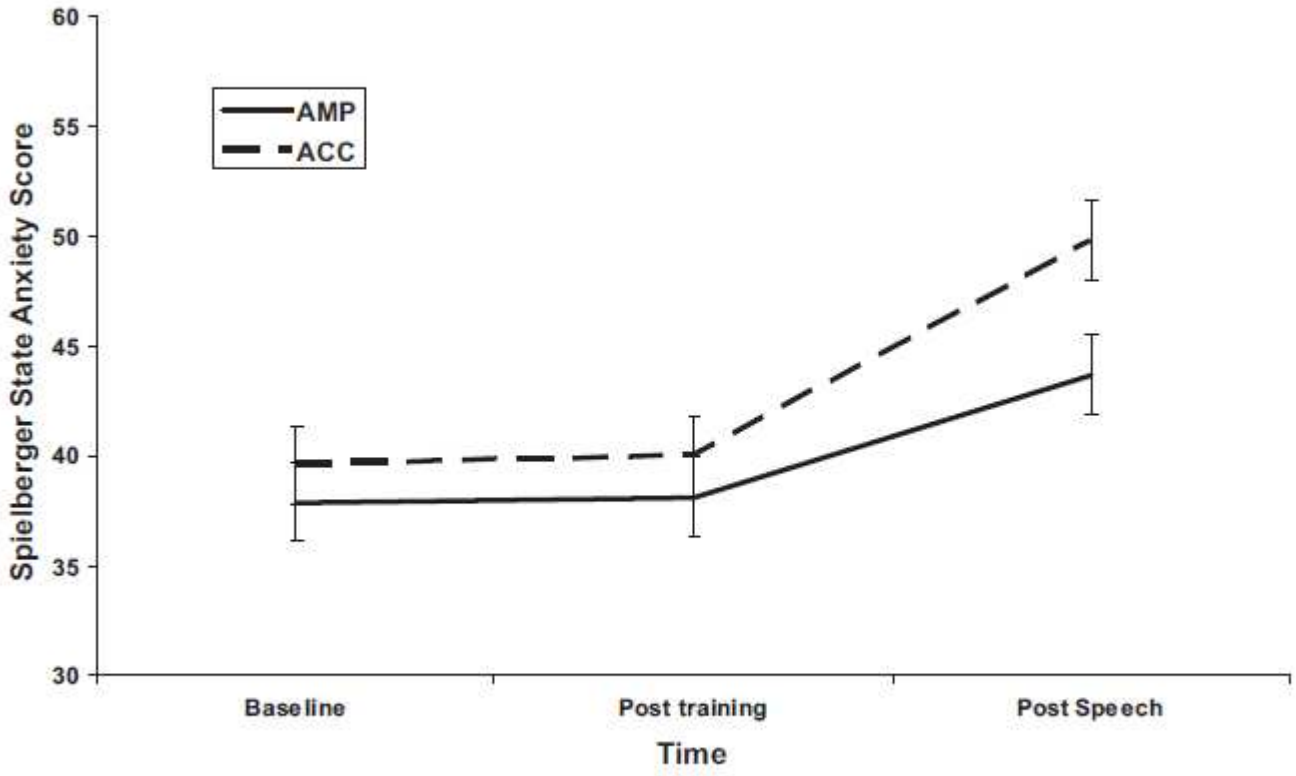


Figure 2. State anxiety scores in the Attention Modification Program (AMP) and Attention Control Condition (ACC) groups. Error bars represent standard error of the mean.

Schmidt et al. (2009) *JAP*

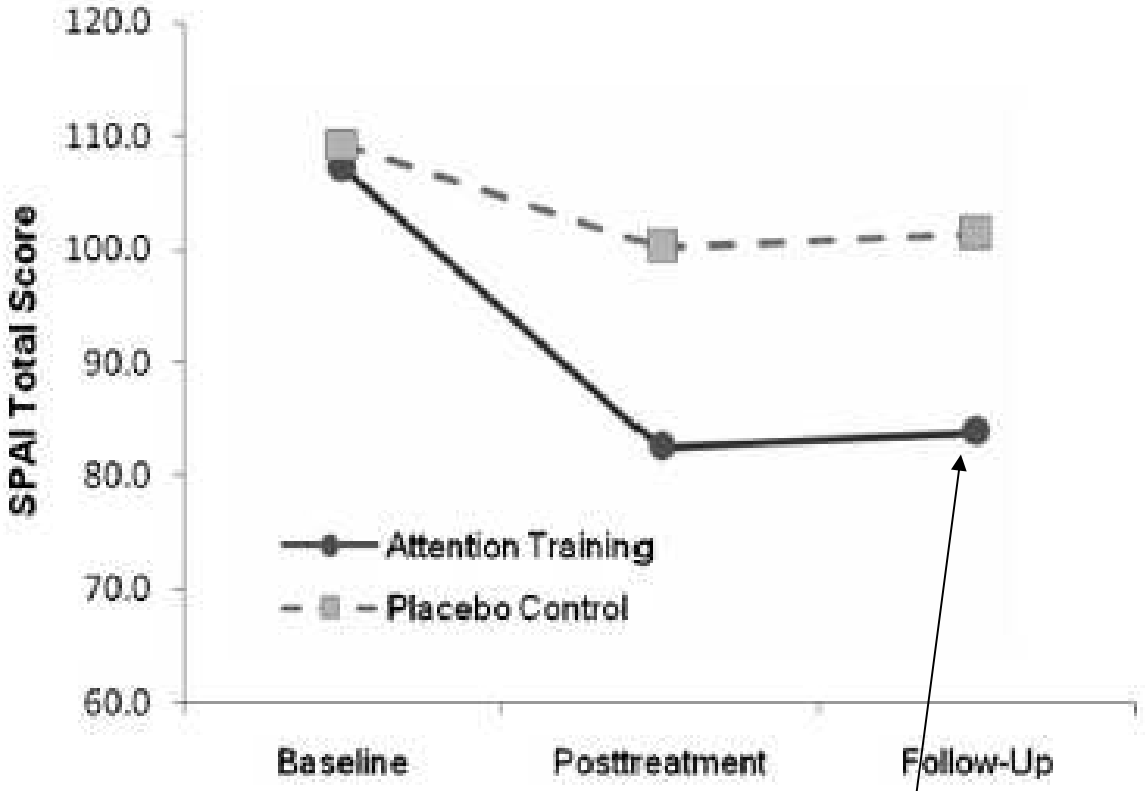


Figure 1. Social Phobia and Anxiety Inventory (SPAI) social anxiety score over time.

4-month follow-up

Illustrations

Study 1

A randomized controlled trial of attention training in Social Phobia: Effects at the behavioral, subjective, and physiological levels.

Heeren, A. & Philippot, P. (in prep.)

Theoretical background

- Training to attend to non-threatening stimuli is related to short-term (e.g., Amir et al., 2008) and long-term emotional changes (e.g., Schmidt et al., 2009).

- Attention bias modification serves to reduce emotional vulnerability to subsequent stressor (Amir et al., 2008; See et al., 2009).

Theoretical background

- A lack of the flexible use of attention that may contribute to cognitive vulnerability and maintenance of emotional disorders (e.g., Wells, 2000).

- The most relevant target for attention training in Social Phobia might thus be the flexible use of attention in social contexts.

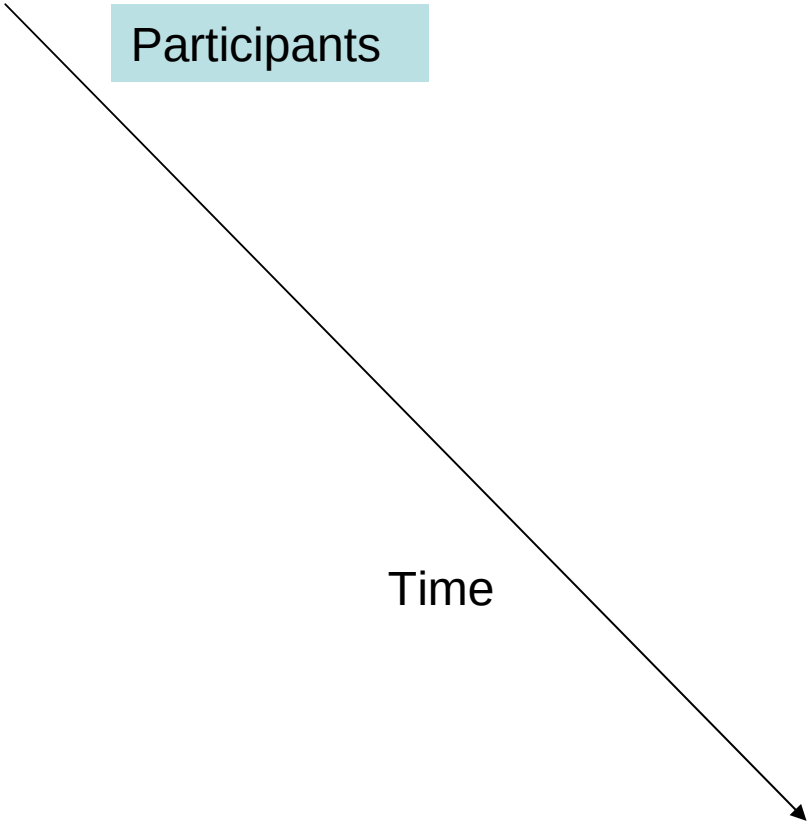
Predictions

- Those trained to attend to non-threatening stimuli and those trained to flexibly adapt their attention would present

- *(1) a decrease of attention bias toward threat,*
- *(2) lower social anxiety,*
- *(3) lower physiological and subjective responses to a stressor, which is in our case, a speech task*
- *(4) improvement of behavioral performance during a speech task.*

- These effects would be stronger for participants trained to flexibly adapt their attention

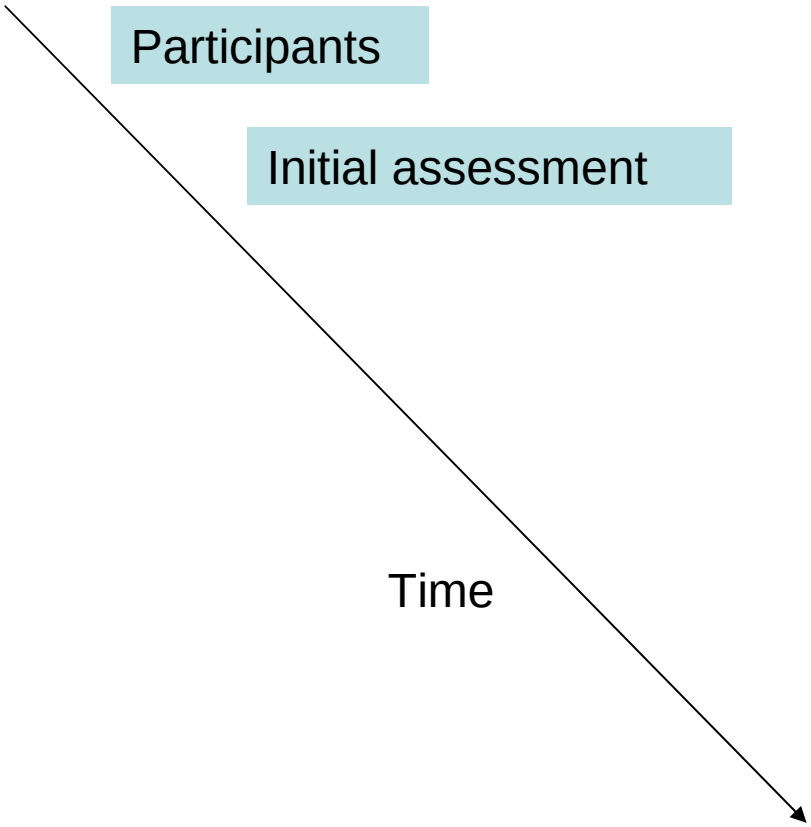
Method: Overview



Participants

- 54 social phobic individuals (M = 21.91 years old, SD = 3.22)
- Selected using the Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987)
- and a semi-structured interview (MINI; Lecrubier et al., 1994)
- Exclusion criteria: (1) heart, respiratory, or neurological problems, (2) psychotropic medications, or (3) participating in other treatment

Method: Overview

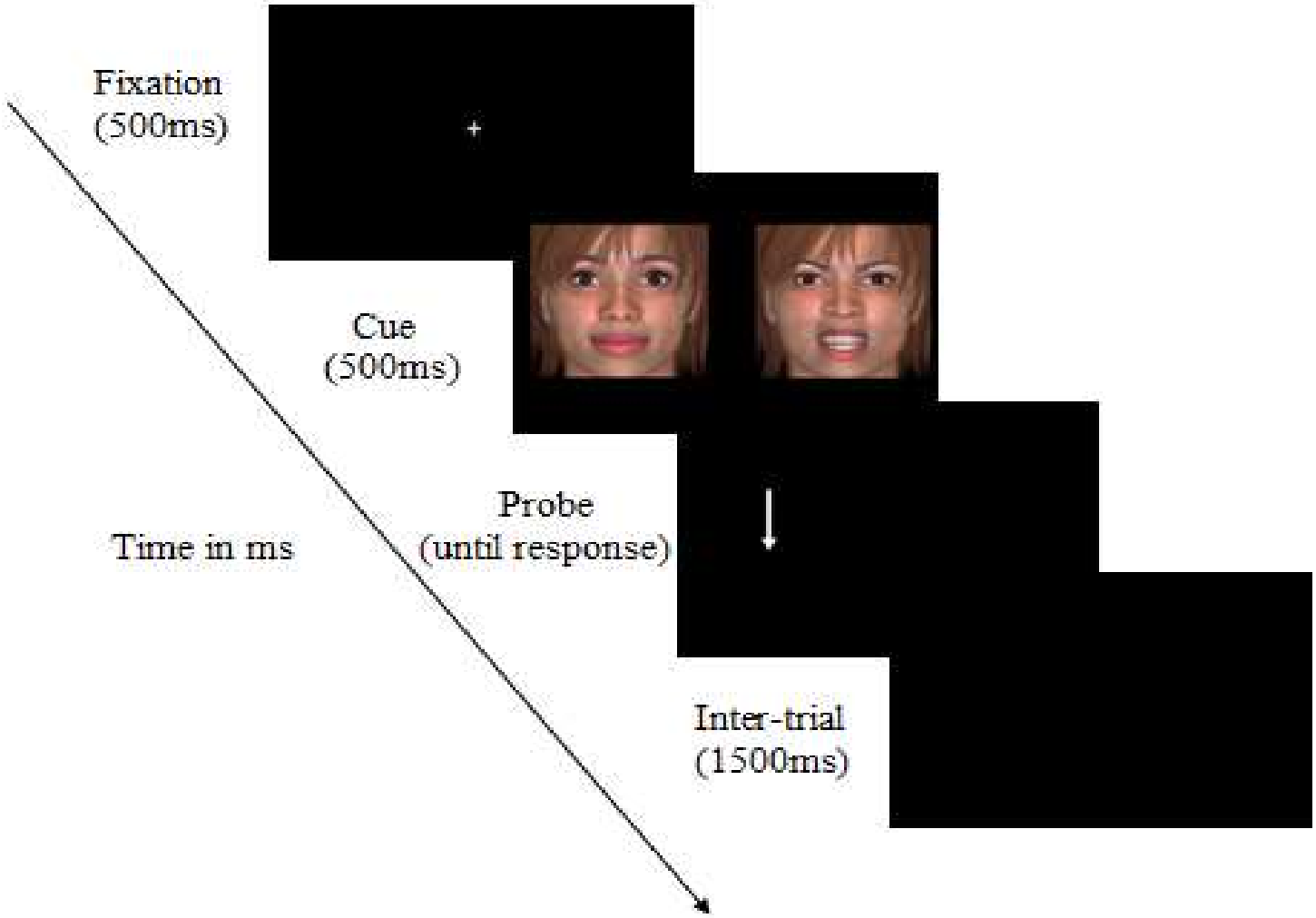


Measures at initial assessment

- BDI-II (Beck and Steer, 1987)
- Stait-Trait (Spielberger et al., 1983)
- Emotional responses to a speech task

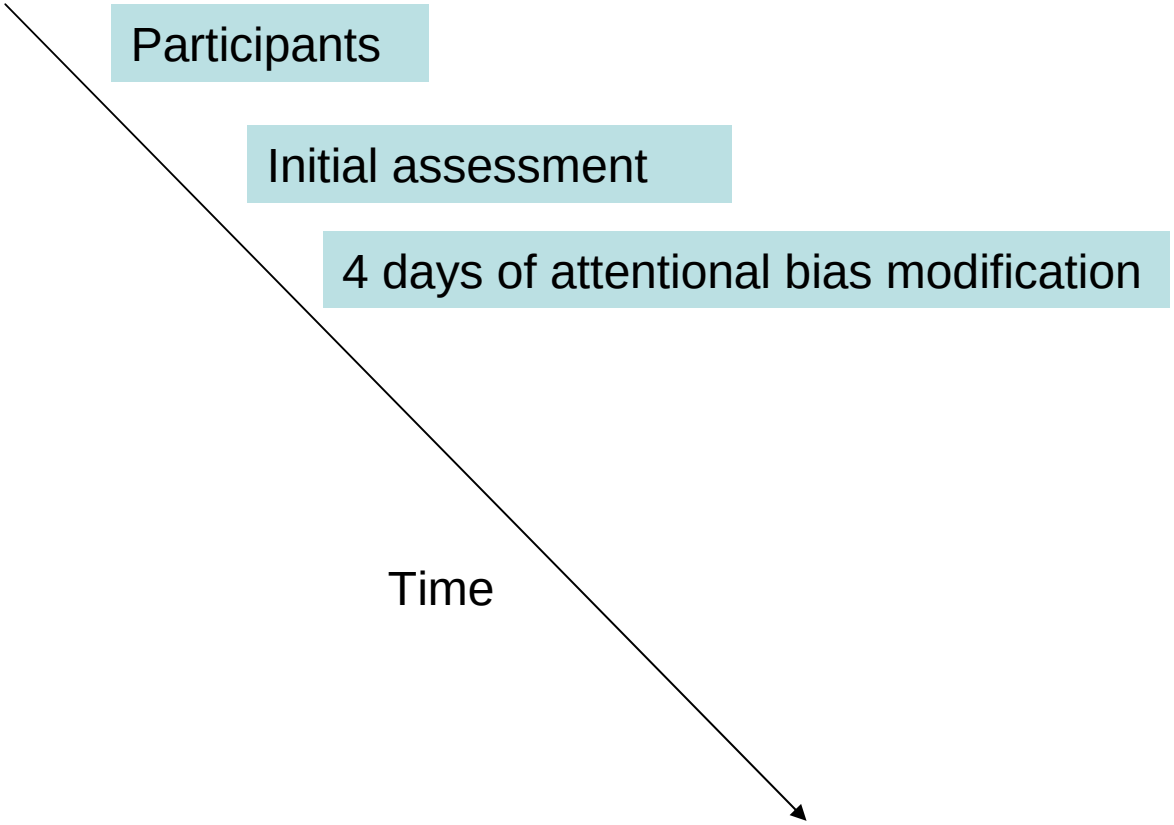
- Psychophysiological responses (Heart rate and Skin conductance)
- Subjective Units of Discomfort Scale (SUDS; Wolpe, 1958)
- Behavioural Assessment of Speech Anxiety (BASA; Mulac & Sherman, 1974)

- Attention bias assessment: Dot-probe task



96 trials = 24 faces pairs X 2 positions X 2 arrow's directions

Method: Overview



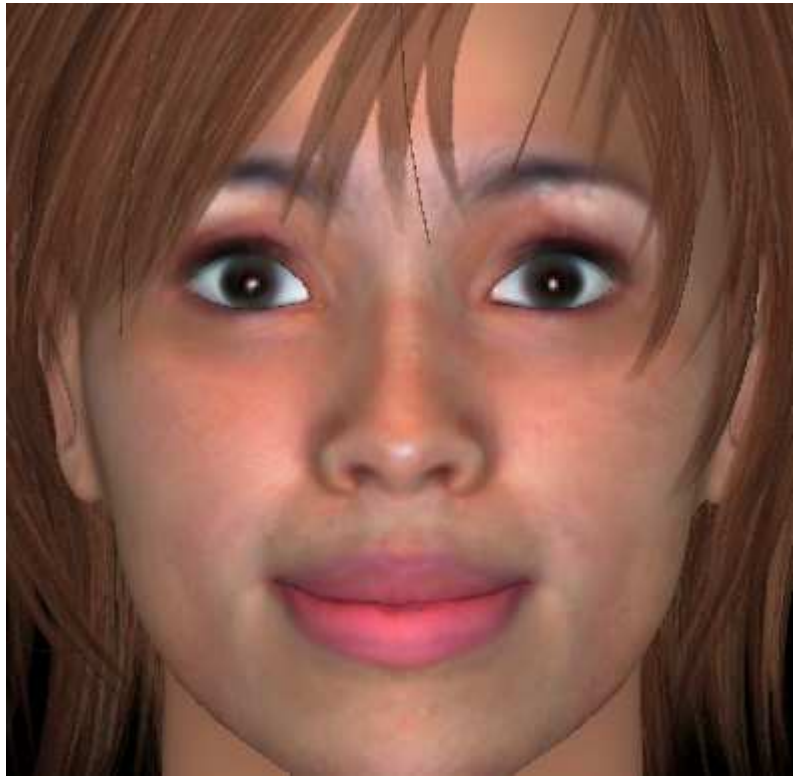
Four Sessions of Bias Modification

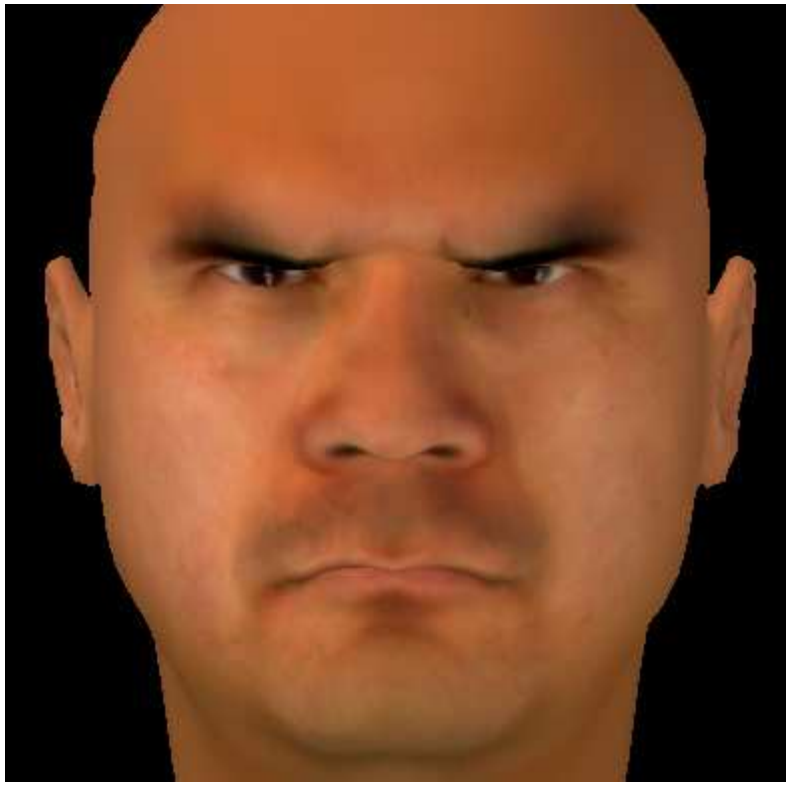
For each condition, participants saw 744 trials per day and were randomly allocated to one of the three conditions:

- ***Attention to threatening faces*** : The probe always replaced the angry face.
- ***Attention to non-threatening faces***: The probe always replaced the light happy face (40%) < neutral faces as threatening is a default mode for socially anxious (Yoon & Zinbarg, 2008)
- ***Attention flexibility***: For 80% of the trials, the probe replaced the angry face and for 20% of the trials, the probe replaced the non-threatening face. After 200 trials, a switch occurs with the 20/80 ratio. The switch was operated 4 times during each session.

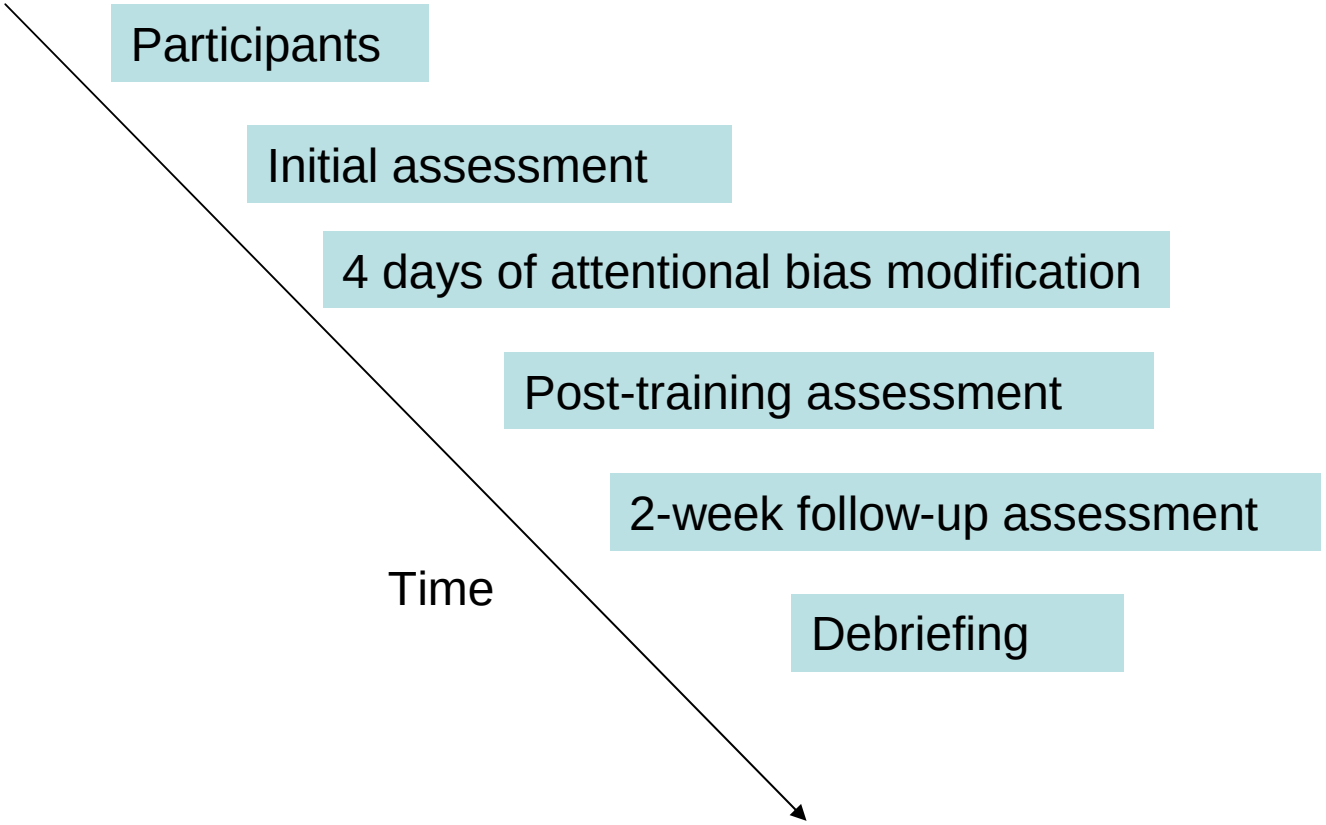
Faces pairs were generated using FaceGen 3.1 software (Singular Inversions Inc., 2008)

Examples of faces pairs





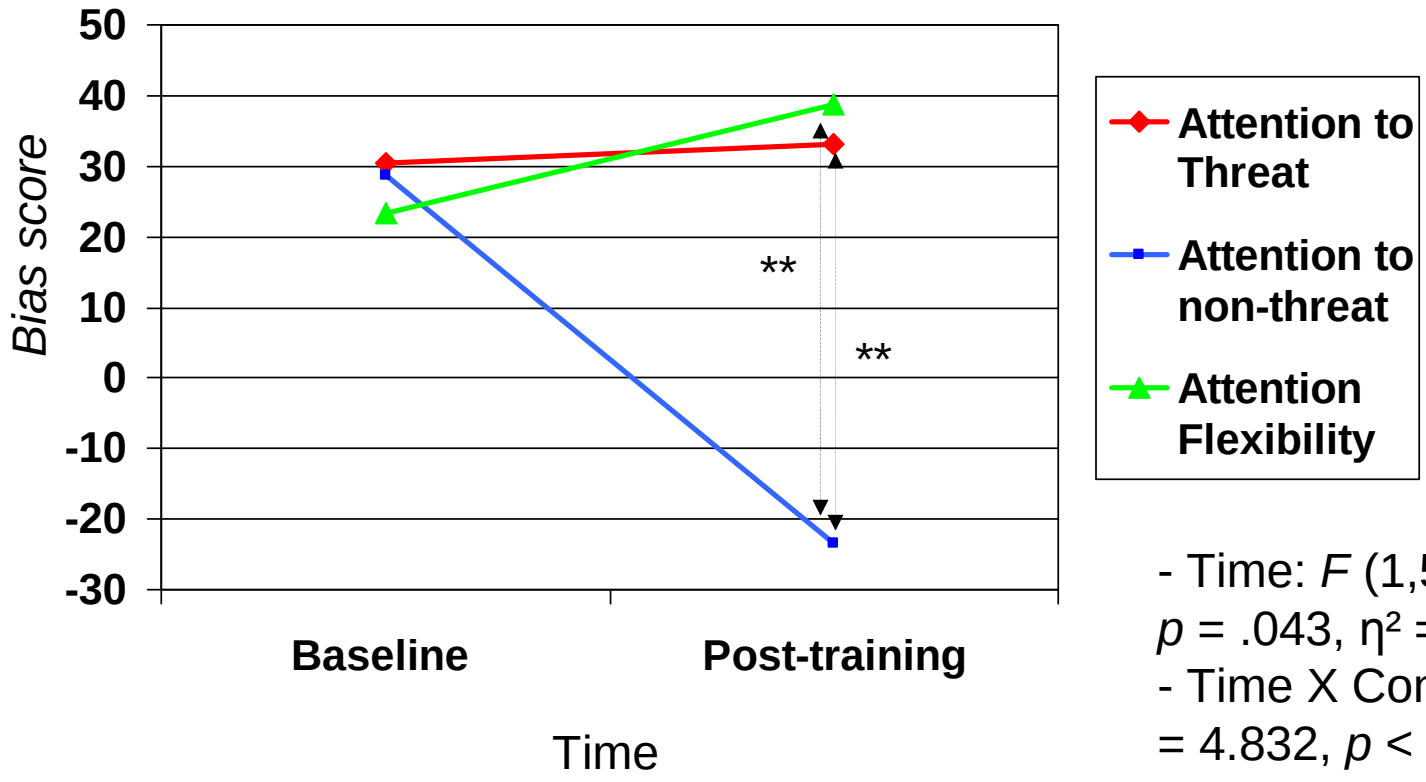
Method: Overview



Results

Attention bias change: Dot-probe task.

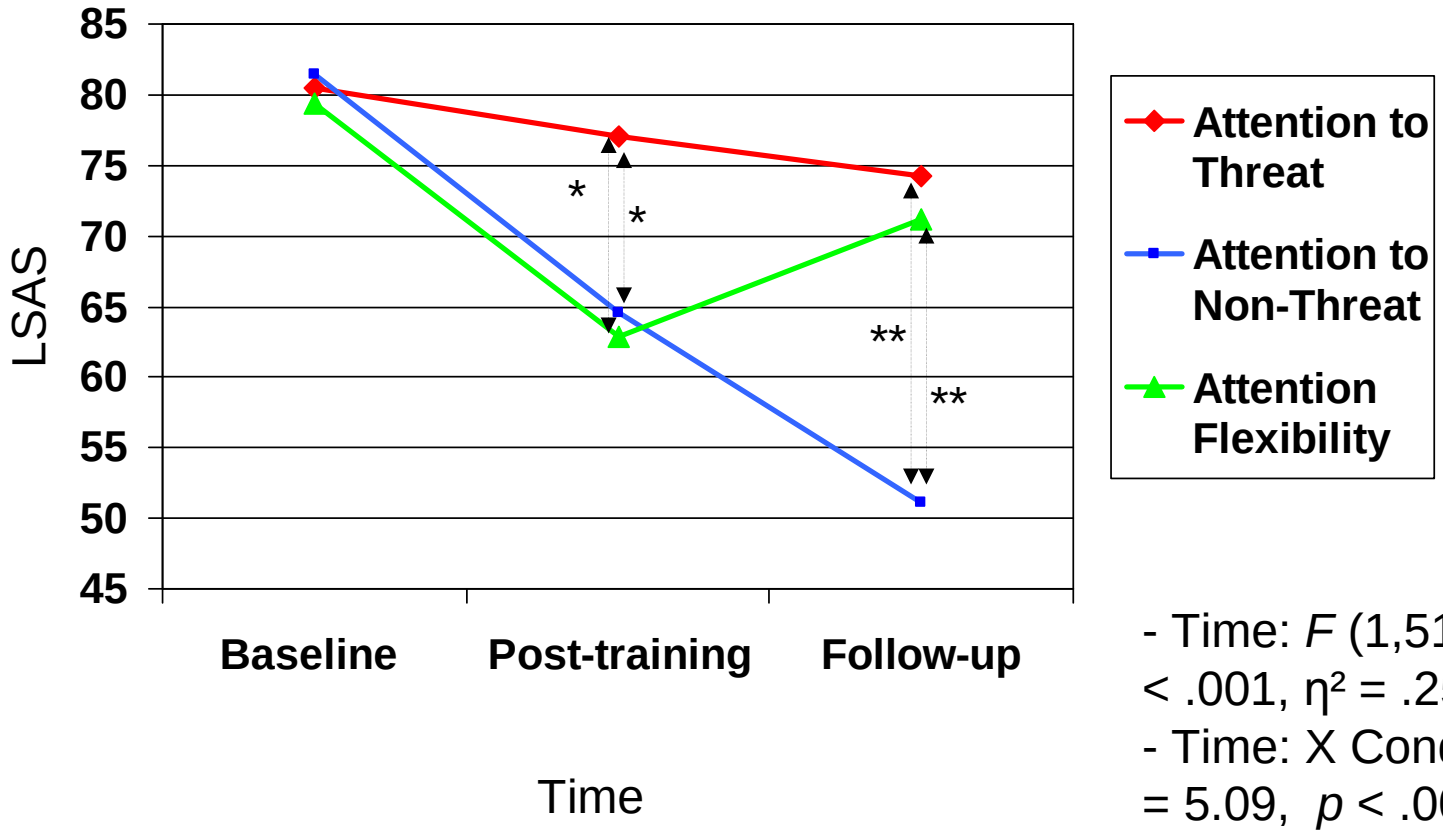
Bias scores were computed by subtracting the mean latencies when the probe was in the same location as the anger face from the mean latencies when the probe and anger face were in different locations



- Time: F (1,51) = 3.237, p = .043, η^2 = .06
- Time X Condition: F (1,51) = 4.832, p < .002, η^2 = .16.

Self-reported measures of social anxiety

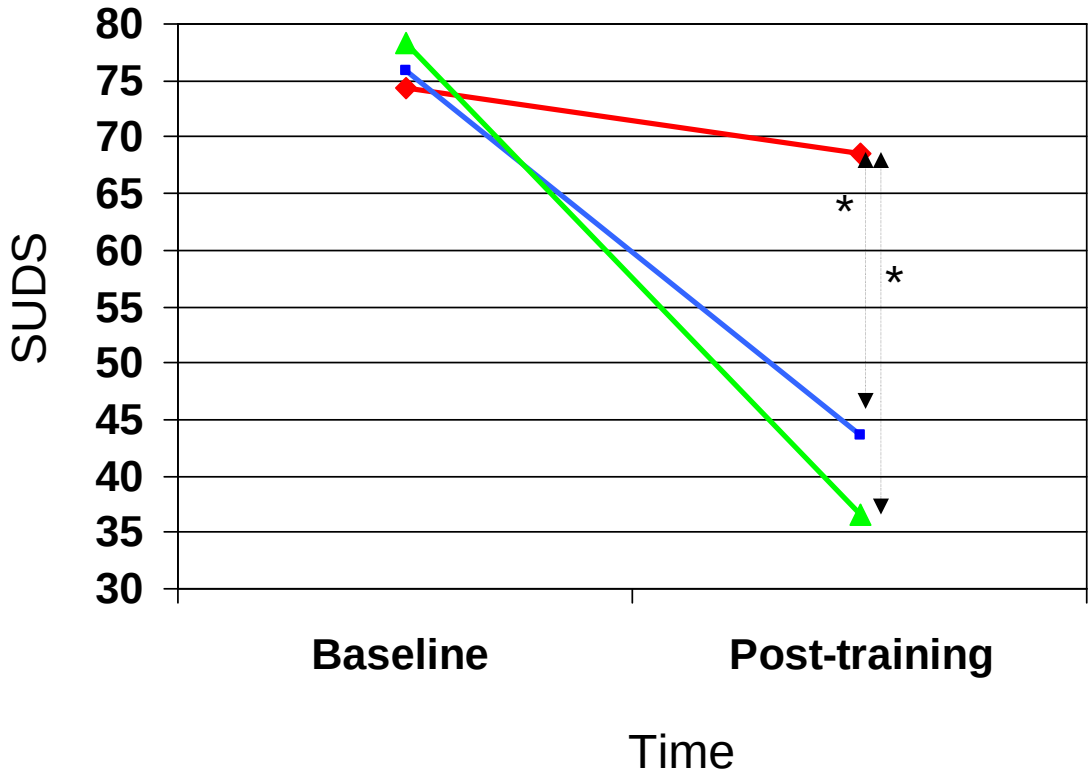
Liebowitz Social Anxiety Scale.



- Time: F (1,51) = 16.193, p < .001, η^2 = .25,
- Time: X Condition: F (1,51) = 5.09, p < .002, η^2 = .17.

Responses to an induced social stressor

Subjective response.

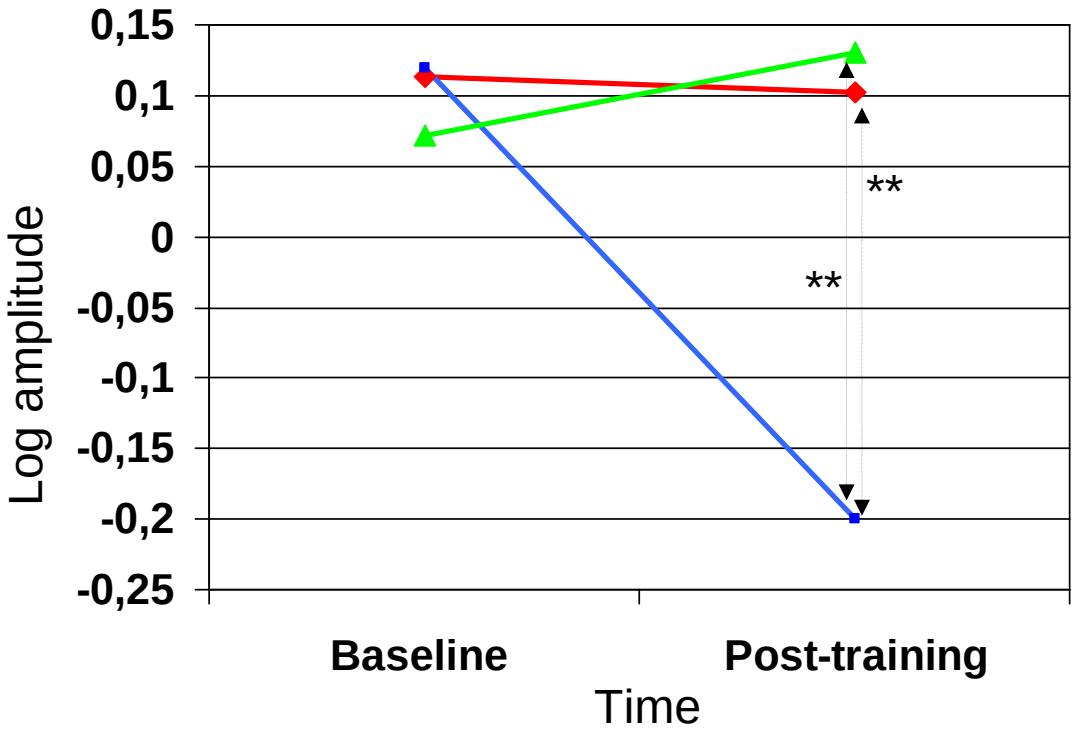


-Time, F (1,51) = 54.178, $p < .0001$, $\eta^2 = .51$
- Time X Condition, F (1,51) = 8.694, $p < .0001$,$\eta^2 = .26$

Responses to an induced social stressor

Psychophysiological responses.

For skin conductance

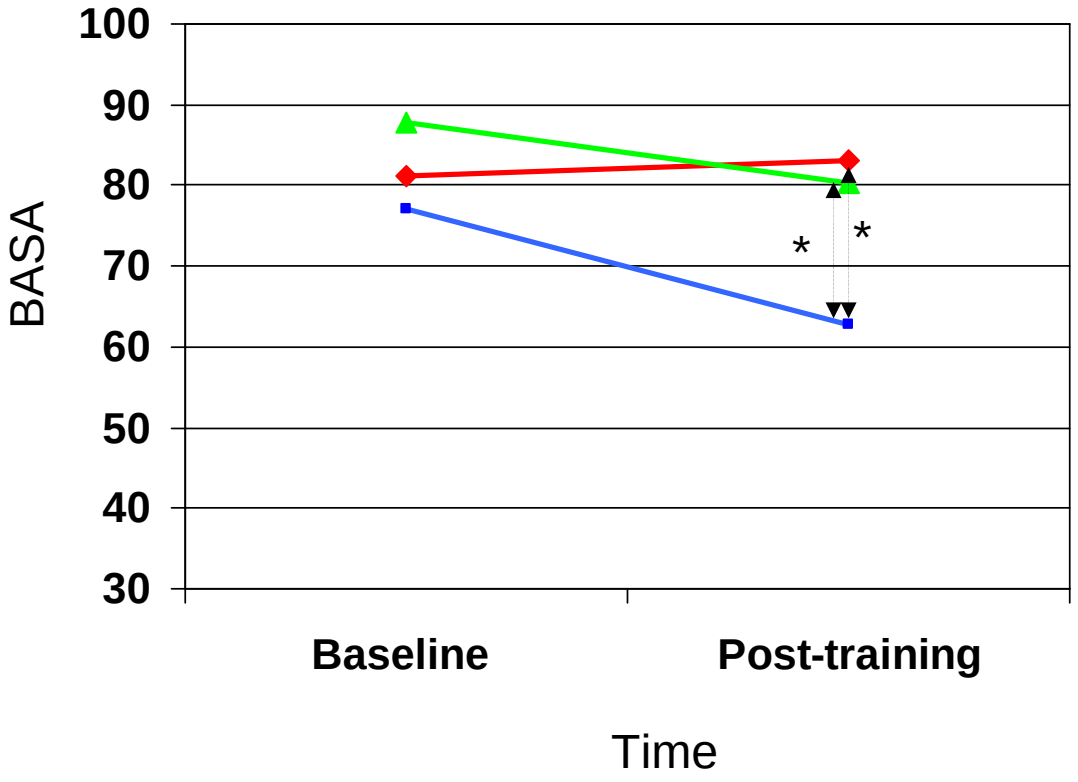


- Time X Condition, F (1,51) = 10.716, $p < .0001$, $\eta^2 = .30$

For heart rate, no effects were significant

Responses to an induced social stressor

Behavioural responses.



-Time X Condition,
F (1,51) = 5.249,
p < .02, η^2 = .11

Discussion

- Training to attend to friendly faces appears to be more effective in reducing social anxiety than training attentional flexibility.
- Outcome at post-training interacted with the type of measure used. Effects for the attention flexibility training only appear for self-reports.
- The present data support previous account noting that attention bias modification serves to reduce emotional vulnerability to a subsequent stressor (e.g., Amir et al., 2008), and extend this notion to psychophysiological reactivity.
- At the least, the present data questions the operationalization of the flexibility training.

Study 2

The causal nature of attentional biases for threatening stimuli in the perception of social rejection

Heeren, A., Peschard, V., & Philippot, P. (in prep.)

Theoretical background

- Cognitive models postulate that attentional bias for threat play a role in the installation of Social Phobia (e.g., Clark, 2001)

- According to Amir et al. (2008), attentional biases directly affect emotional vulnerability to social stressors

- However, no study has directly assessed the question of the causal status of attentional biases on social anxiety

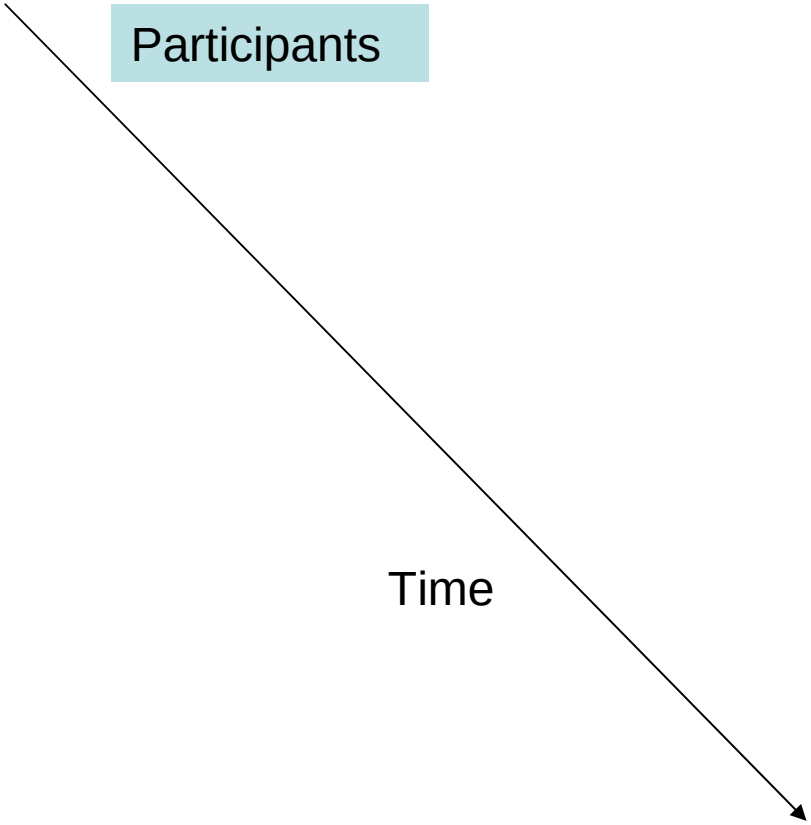
- The present study aimed to directly assessed this question

- Overview: Two consecutives phases

1. *An attentional biases induction phase*: a modified version of the dot-probe task designed to induced a biased attentional response for threatening stimuli

2. *A stress phase*: emotional response during a task inducing social rejection

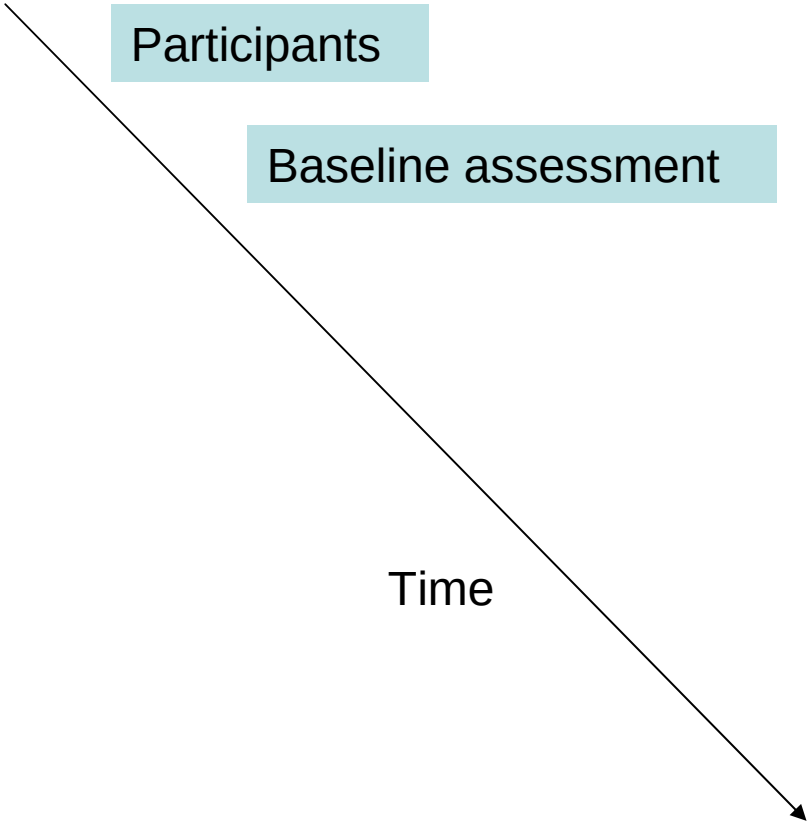
Method: Overview



Participants

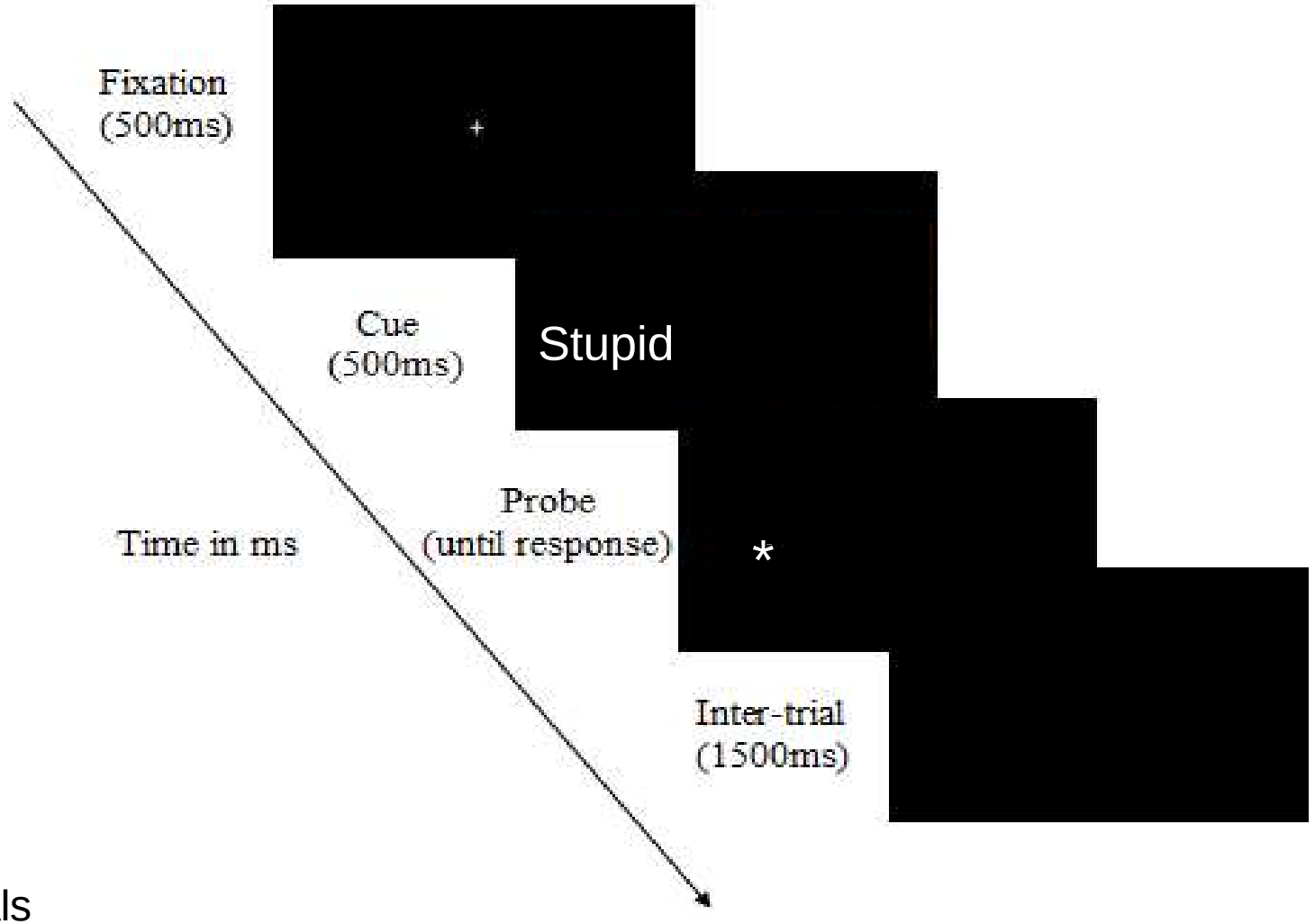
- 43 healthy non-socially anxious individuals (*M* = 22.00 years old, *SD* = 2.89)
- Selected using the Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987)

Method: Overview



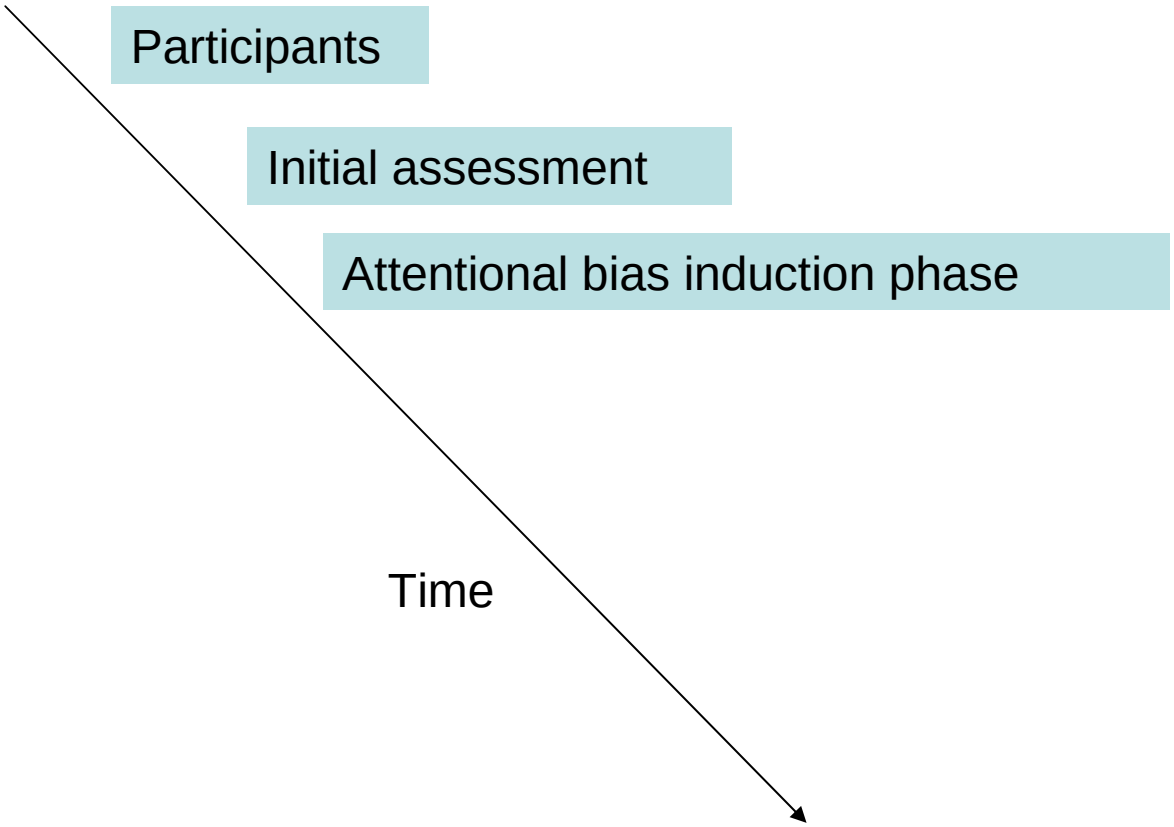
Measures at baseline assessment

- BDI-II (Beck and Steer, 1987)
- Stait-Trait (Spielberger et al., 1983)
- Need to Belong Scale (Leary, Kelly, Cottrell, & Schreindorfer, 2005; French Version; Kuppens & Yzerbyt, 2008)
- Computerized visual analogue scales were administrated after each condition: Mood (from *happy* to *sad*) and anxiety (from *relaxed* to *anxious*) < Based on MacLeod et al., 2002
- Attention bias assessment: Modified Posner Task (Amir et al., 2003)



192 trials
2/3 were validly cued (128 = 8 words x 2 valences X 2 positions x 4 repetitions),
1/6 were invalidly cued (32 = 8 x 2 x 2) and 1/6 were uncued

Method: Overview



Attentional bias induction phase

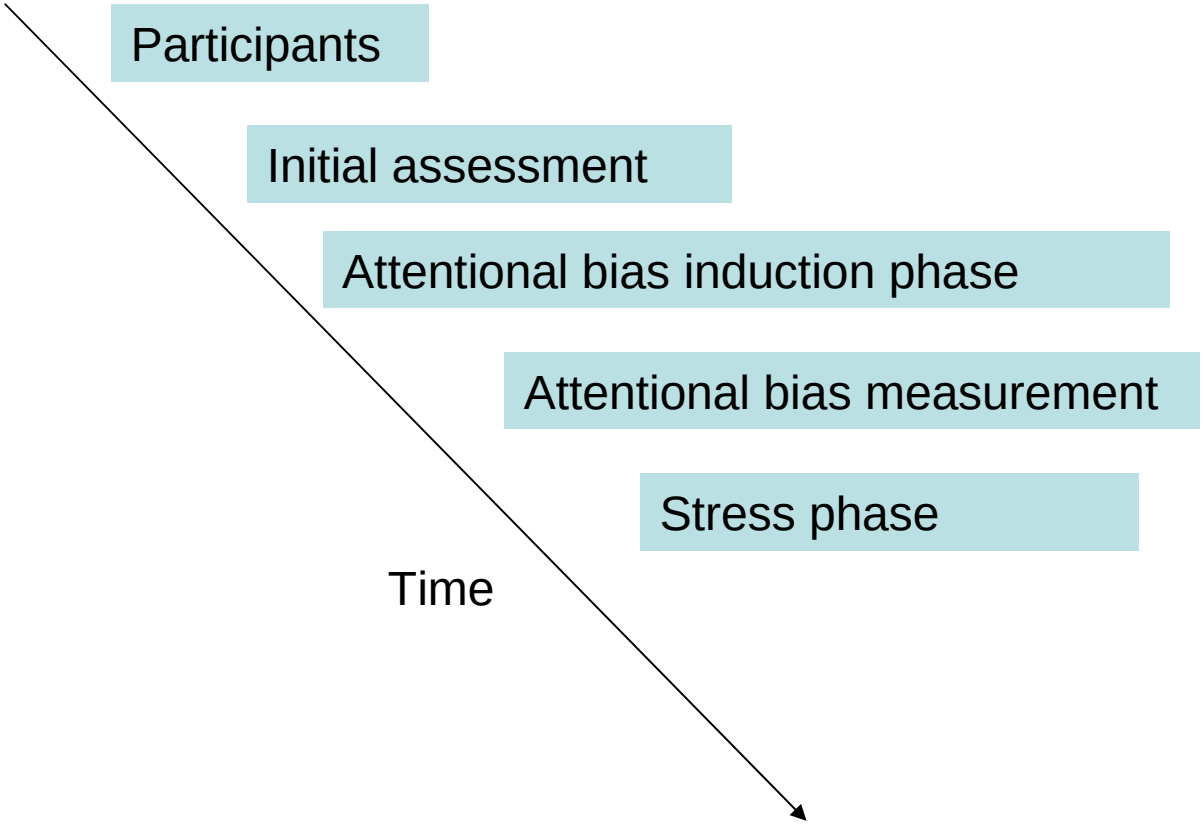
For each condition, participants saw 560 trials and were randomly allocated to one of the two conditions:

- ***Attention Threat Condition***: probes appeared in the position of the disgust faces on 95% of the trials.
- ***Control condition***: No contingencies between cues and probes (50%-50%).

The faces used were selected from the Montreal Set of Facial Displays of Emotion (Beaupré, Cheung, & Hess, 2000)

560 trials = 70 face pairs X 2 screen locations X 2 arrow's direction

Method: Overview



Stress phase

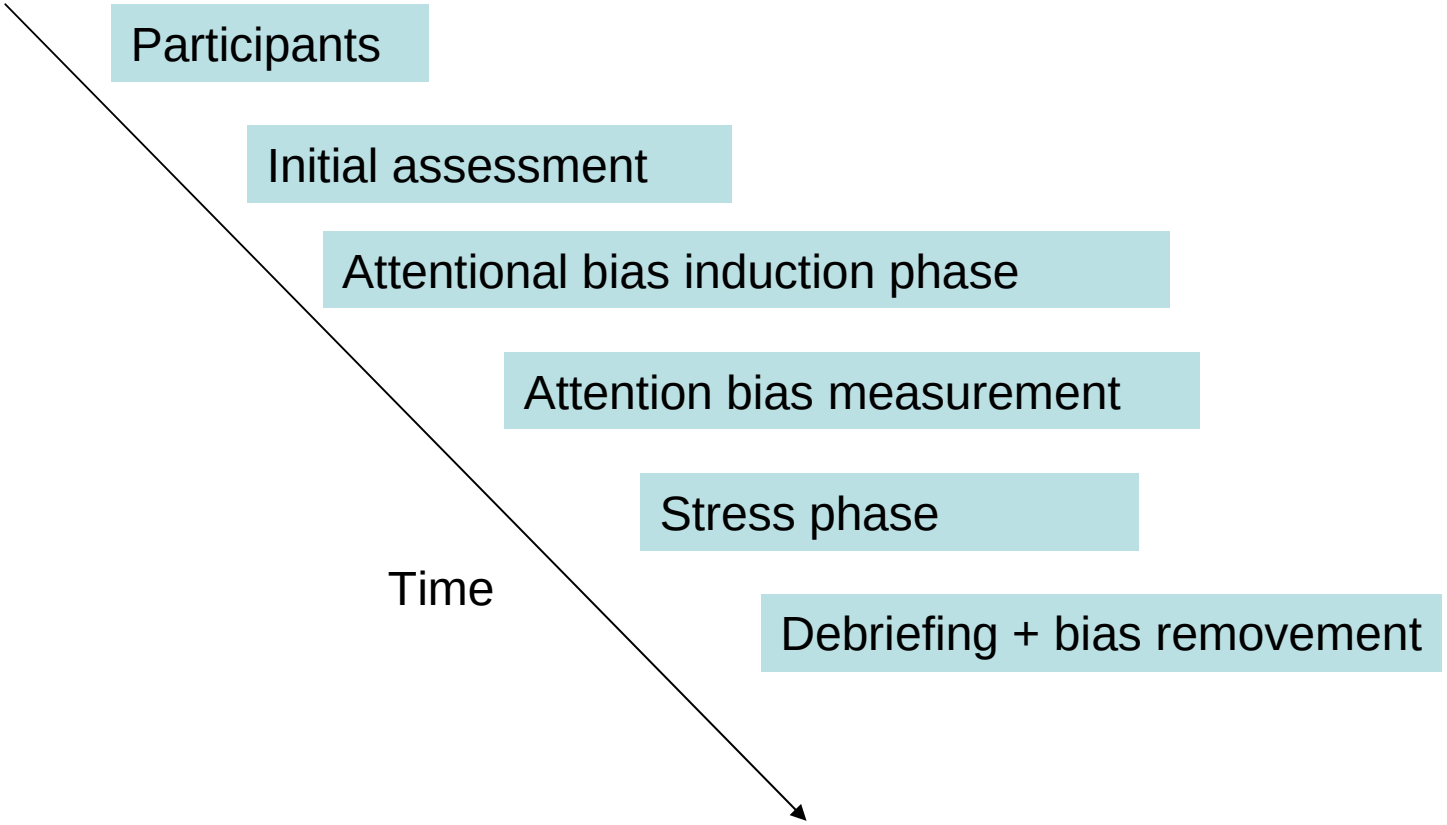
Each participant was exposed to a social exclusion task using, a Cyberball paradigm (Williams & Jarvis, 2006) including three different conditions:

1. *The inclusion condition*: the probability that participants would be thrown the disc was 67%.
2. *The social ostracism condition*: the probability that participants would be thrown the disc was 0%. Participants saw that the two others players are still playing together.
3. *The technical problem condition*: the probability that participants would be thrown the disc was again 0%. However, participants didn't see that the two others players are still playing and a screen appears indicating the occurring of a technical problem and a network transitory disconnection.

Each condition rest for **50 throws**, except the technical problem which was occurring for 60 seconds. The two last condition were counterbalanced between participants.

Emotional reactivity: Computerized visual analogue scales were administrated after each condition.

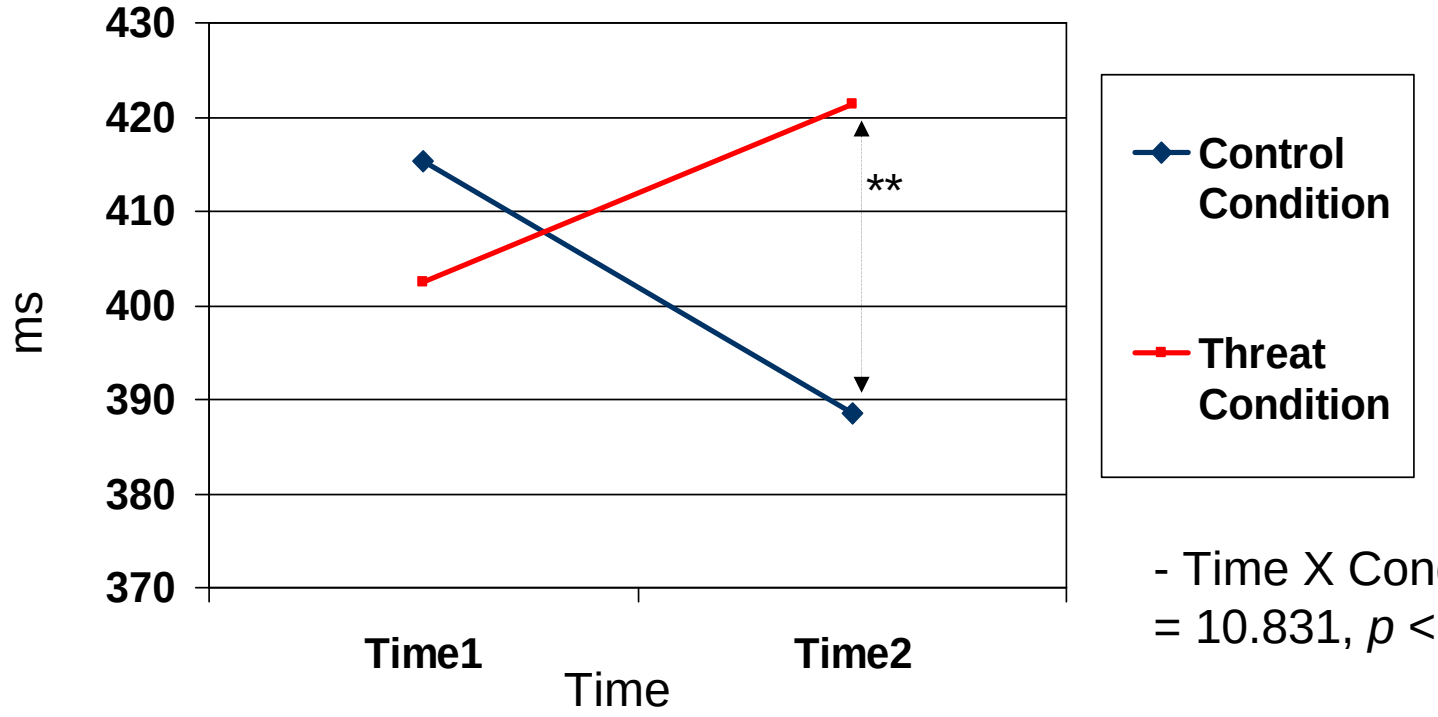
Method: Overview



Results

Attention bias change

Only significant for invalid social threatening words

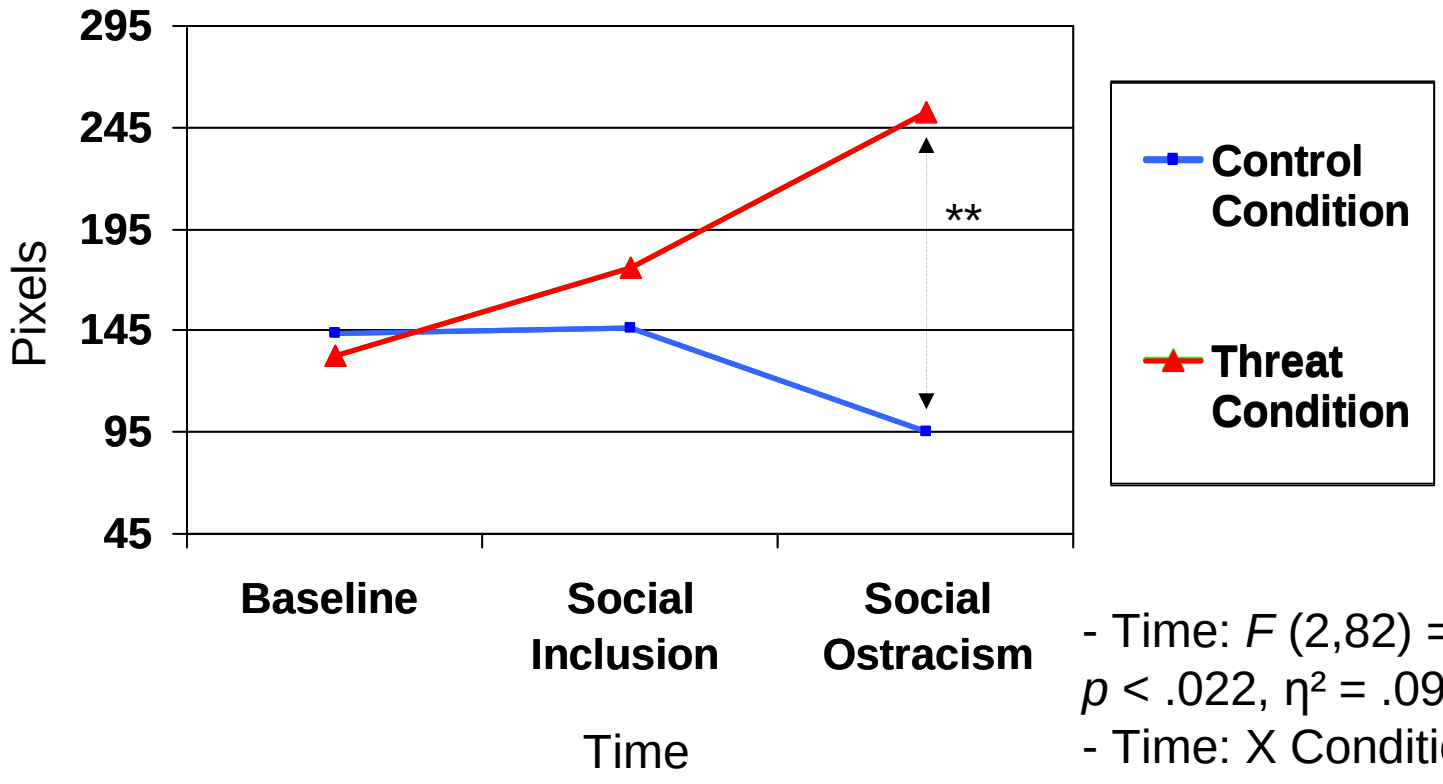


- Time X Condition: F (1,41) = 10.831, p < .003, η^2 = .21.

For others components, no effects were significant

Emotional response to social exclusion

Visual analogue scale: Anxiety.

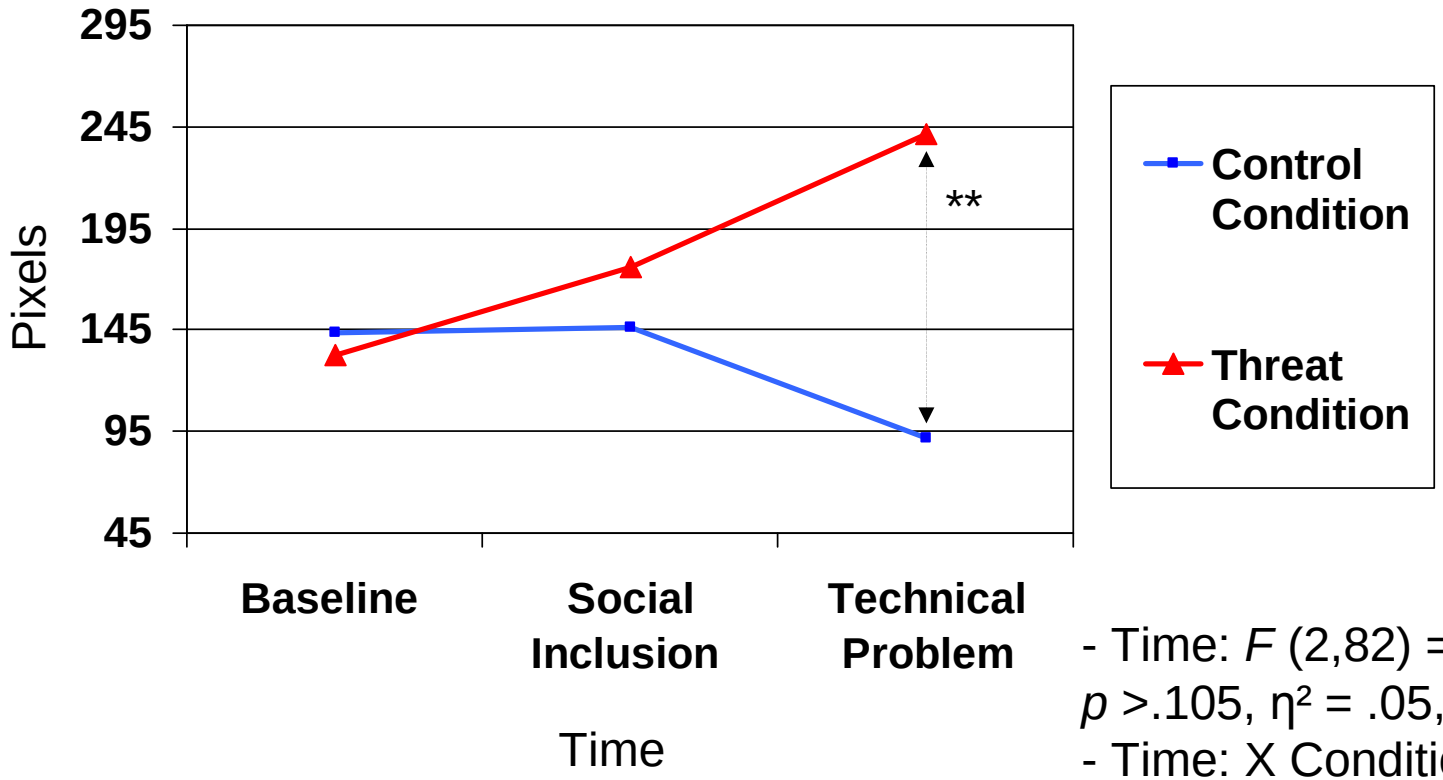


- Time: F (2,82) = 4.054, $p < .022$, $\eta^2 = .09$,
- Time: X Condition: F (2,82) = 24.441, $p < .0001$, $\eta^2 = .37$.

For mood scale, no effects were significant

Emotional response to social exclusion

Visual analogue scale: Anxiety.



- Time: F (2,82) = 2.315, p >.105, η^2 = .05,
- Time: X Condition: F (2,82) = 17.68, p < .001, η^2 = .30.

For mood scale, no effects were significant

Discussion

- Inducing an attentional bias for disgust faces is related to an increase of anxiety during social rejection and seems only affect the capacity to disengage attention from socially threatening stimuli.

- The effect of the bias induction on the “technical problem” condition might be related to the perception of an implicit social rejection vs. considered as an unspecific stressor. Suggestions for future studies.

- The present data support previous account noting that attention bias manipulation modulates emotional vulnerability to a social stressor (e.g., Amir et al., 2008)

- The present data are consistent with cognitive models of social phobia suggesting that attentional biases for socially threatening stimuli may play a role in the development of social phobia (e.g., Clark, 2001).

General conclusions

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Thank you for your attention

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