

The strength of adaptation to negative versus positive emotional information depends on social anxiety status

Erinda Morina, Sarah C. Izen & Vivian M. Ciaramitaro
University of Massachusetts Boston, MA, Psychology Department, Developmental and Brain Sciences

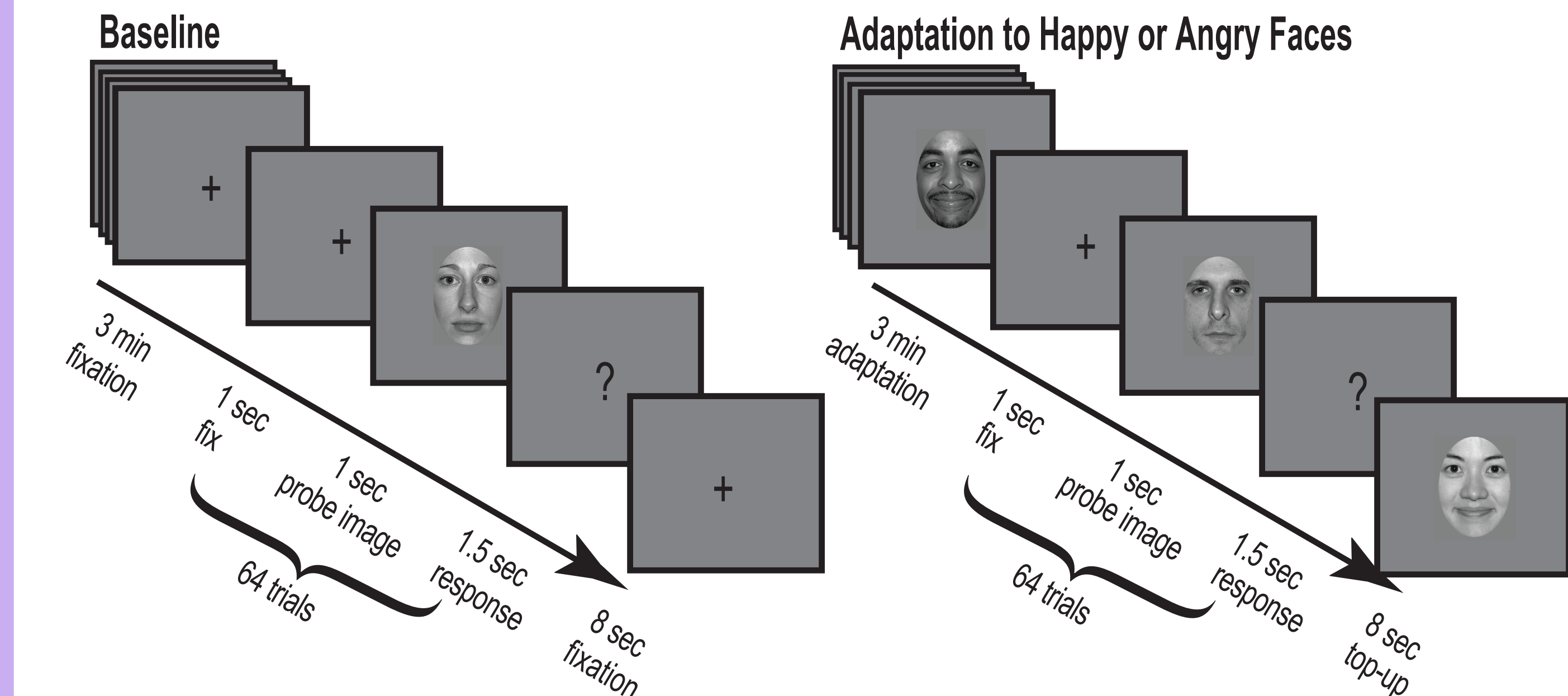
QUESTION: How does social anxiety status, state affect, and face gender alter biases in perceiving emotions pre- & post-adaptation?

Facial expressions represent a crucial source of information about others' emotions. But, the process of interpreting facial expressions may be disrupted in people with social anxiety (e.g., Yoon & Zinbarg, 2007). Studies have shown that socially anxious individuals tend to have a negative bias in interpreting emotional expressions (Heimberg, Brozovich, & Rapee, 2014). Other factors that can also contribute to a negative bias in perceiving emotion are Negative Affect (NA) and gender of the face.

In the current study we used adaptation to quantify how individuals high in social anxiety process emotional information in a face. We also investigated how Negative Affect and the gender of the face biases perception of emotions before and after adaptation.

METHODS

Procedure



Participants viewed faces morphed along an emotional continuum (i.e., 80%, 40%, 20%, and 10% happy to neutral with complementary morphs for angry). They judged each face as happy or angry. After adaptation to 100% happy or angry faces they judged the same morphs. We quantified each individual's pre- and post-adaptation Point of Subjective Equality (PSE), where a face is equally likely perceived as happy or angry.

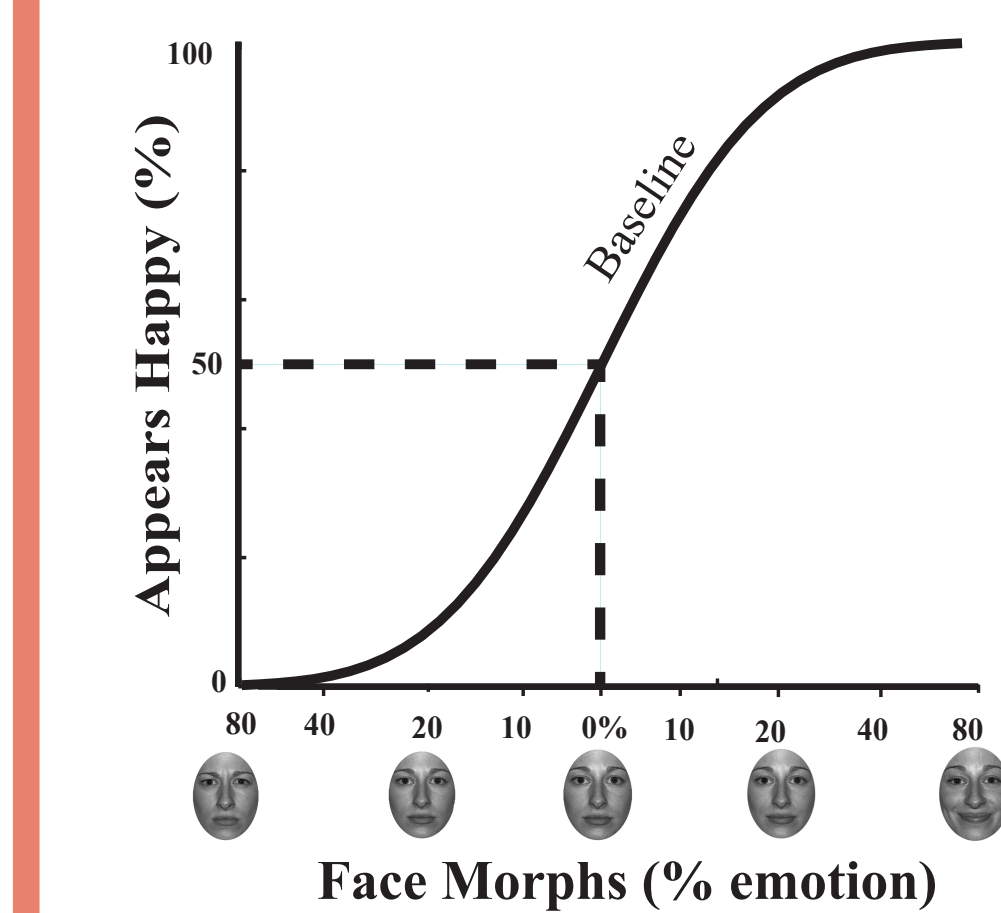
Determining Social Anxiety Status

We assessed social anxiety status using the Brief Fear of Negative Evaluation (BFNE) and a follow up phone interview screening. Scores ≥ 25 were categorized high in social anxiety (HSA); scores ≤ 12 were categorized as low in social anxiety (LSA).

	LSA	HSA
# Participants	36	40
Age	26.22 (+/-9.78)	24.58 (+/-8.33)
Gender (% Female)	55.6%	75%
BFNE	10.19 (+/-1.53)	31.98 (+/-4.24)
DASS	5.56 (+/-4.62)	8.65 (+/-5.13)
Negative Affect	11.72 (+/-2.02)	13.83 (+/-3.10)

DATA ANALYSIS

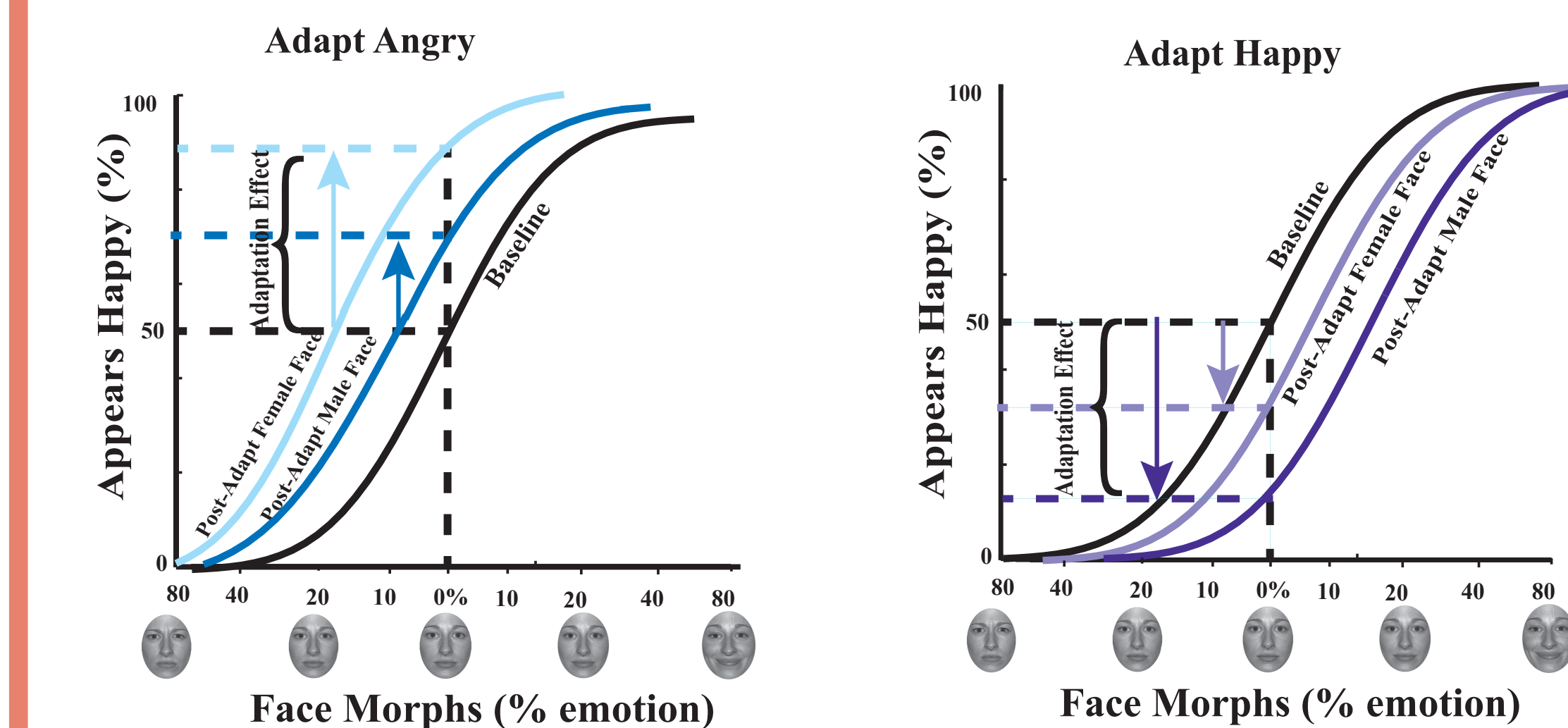
Predictions – Baseline



Before adaptation we measure baseline PSE, the Point of Subjective Equality, or the point at which the individual is equally likely to judge a face as either happy or angry, which is also the unique neutral for each participant

- We expect both groups, HSA and LSA, but especially HSA, to adapt less to angry relative to happy emotions.
- We expect that the larger the NA the stronger would be the negative perceptual bias, especially in HSA
- We expect less adaptation to angry male compared to angry female faces and more adaptation to happy female compared to happy male faces, especially in HSA individuals.

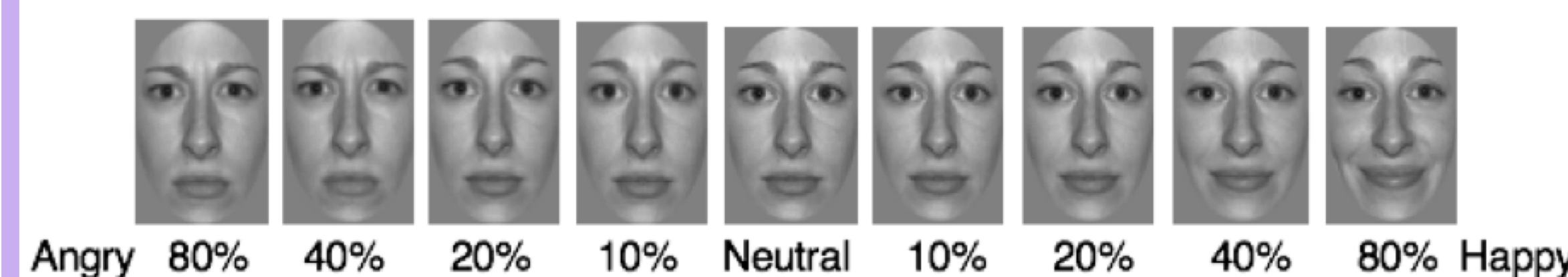
Predictions – Post-Adaptation



After adaptation to angry faces, the same female or male morph is expected to appear happier. We predicted weaker adaptation to male versus female angry faces.

After adaptation to happy faces, the same female or male morph is expected to appear angrier. We predicted weaker adaptation to male versus female angry faces.

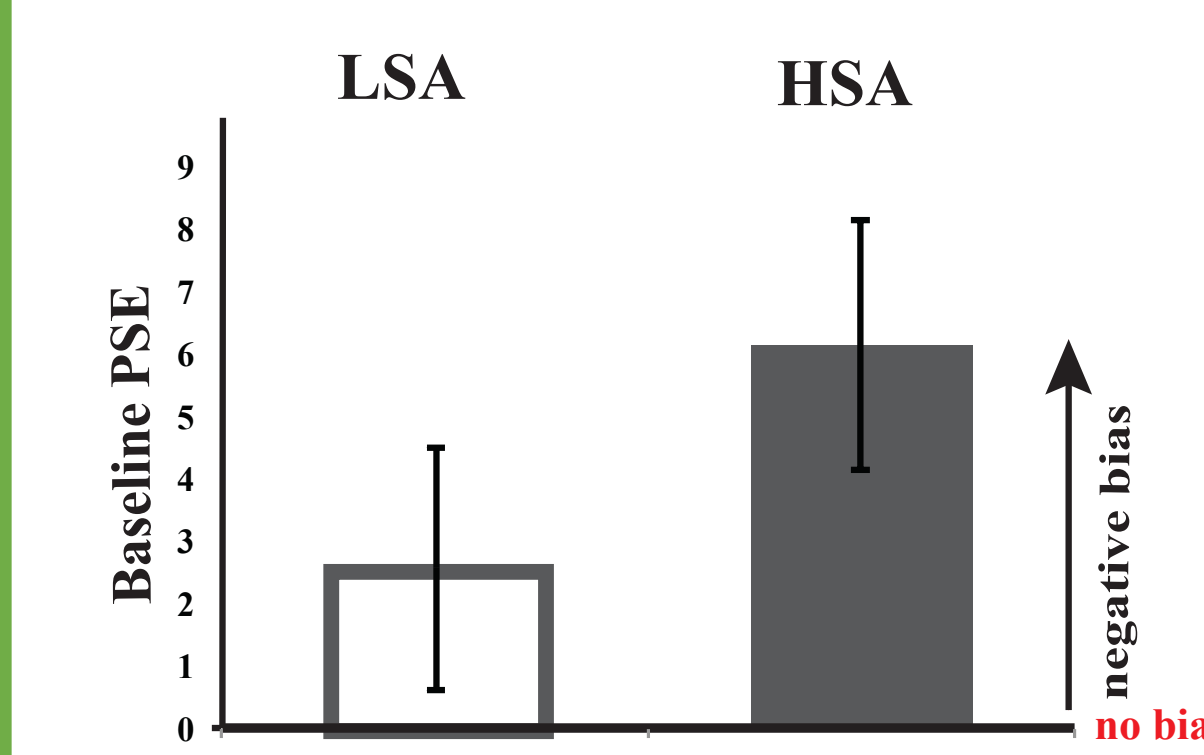
Stimuli



Face stimuli were selected from NimStim (Tottenham et al., 2009). Adaptation consisted of 30 unique faces (15 female and 15 male), in 100% happy or angry. Probe images faces presented as test stimuli consisted of four unique female faces and four unique male faces, each morphed along a continuum from fully affective (80%) angry face to the complementary neutral face for that same identity and from a fully affective happy face to the complementary neutral face.

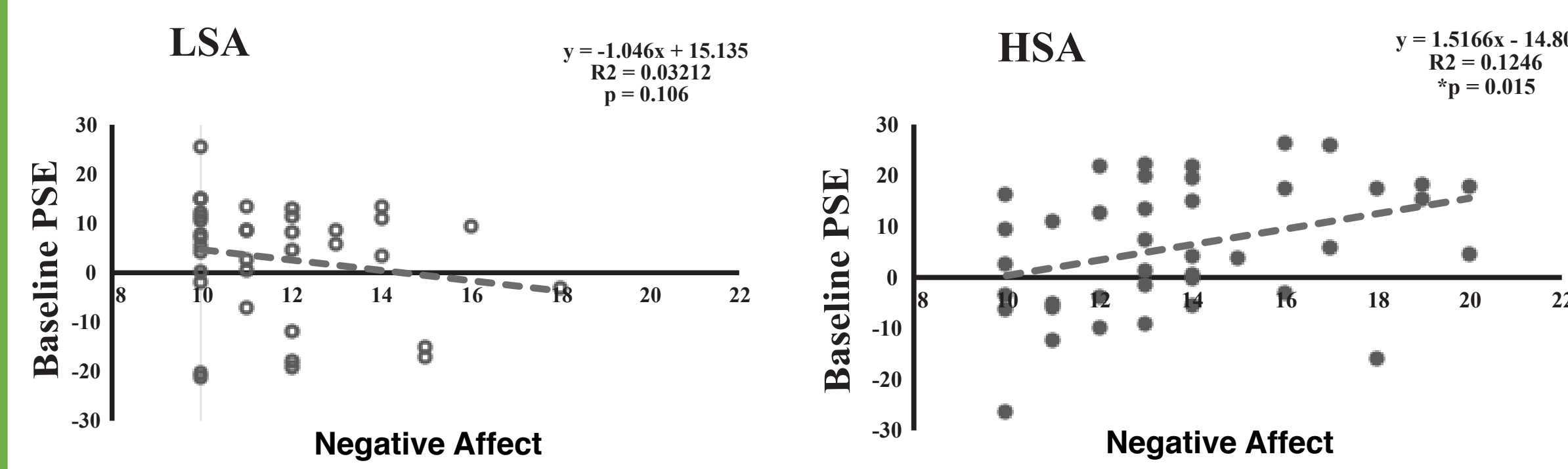
RESULTS

Baseline Biases



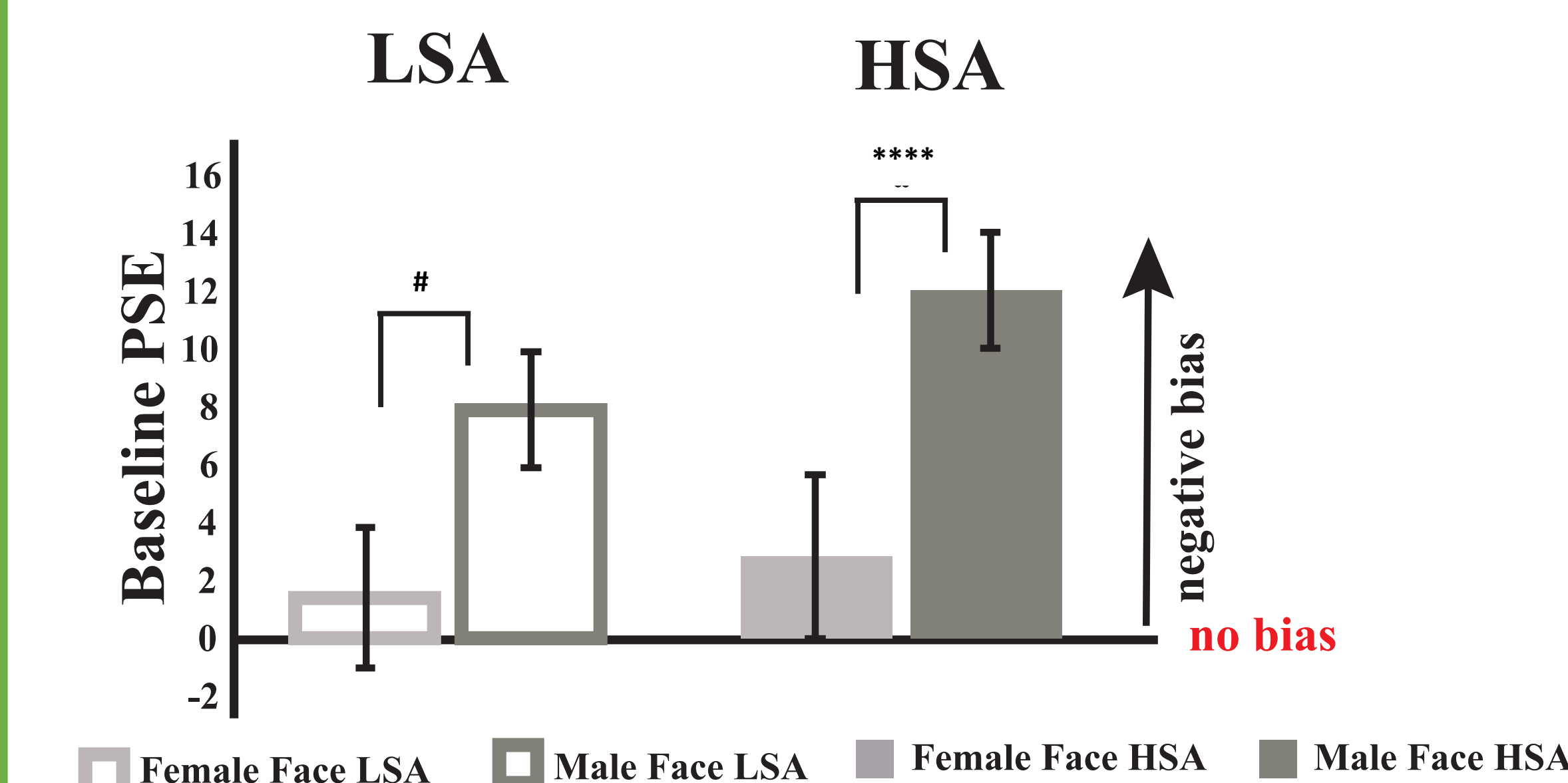
At baseline, High Socially Anxious (HSA) individuals tend to perceive faces more negatively compared to Low Socially Anxious (LSA) individuals. The face they judge neutral has more positive emotion, a negative bias.

Negative Affect Influences Baseline Bias



The stronger negative affect, the stronger negative perceptual biases, but only in HSA individuals.

Gender Influences Baseline Biases



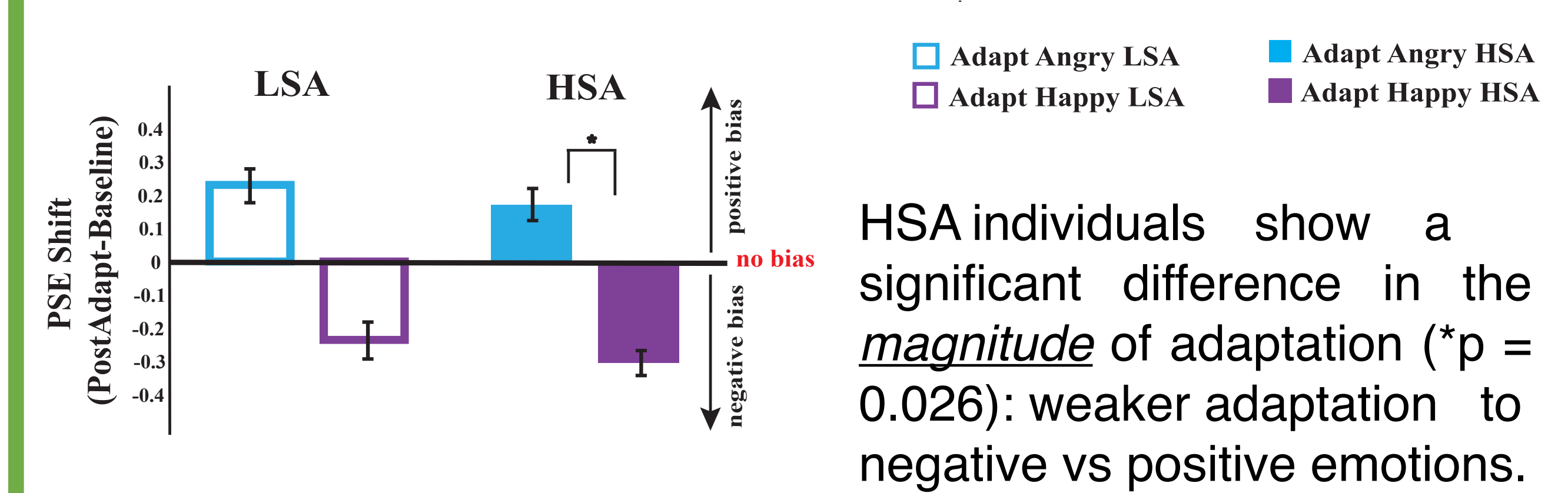
At baseline, male faces are perceived more negatively than female faces, in both HSA ($p = .0005$) and LSA ($p = .001$) individuals.

CONCLUSIONS:

- Negative Affect and face gender may account for differences in baseline bias with social anxiety.
- Adaptation is weaker for negative vs positive emotions in socially anxious individuals, and weaker for angry male faces vs angry female faces.

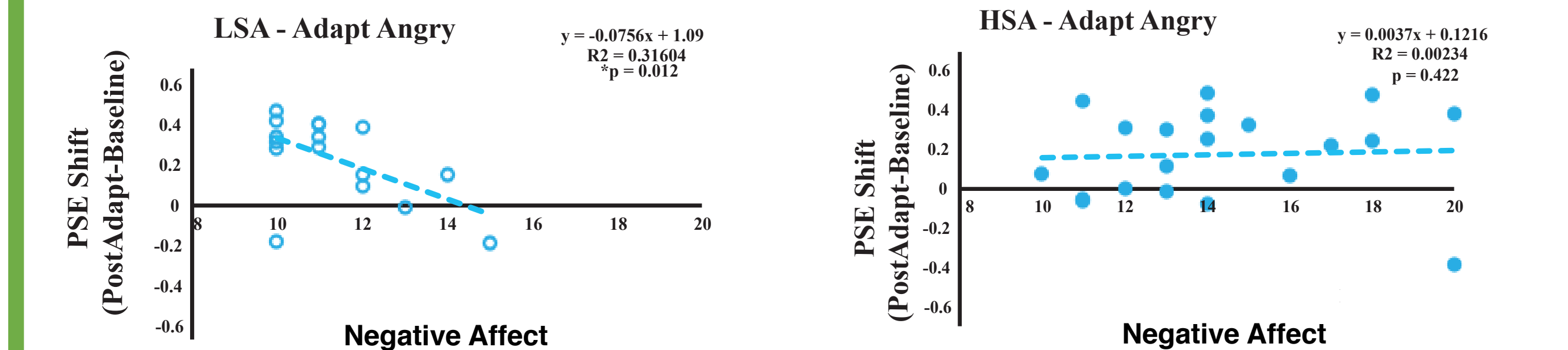
RESULTS

Post-Adaptation Perceptual Shifts

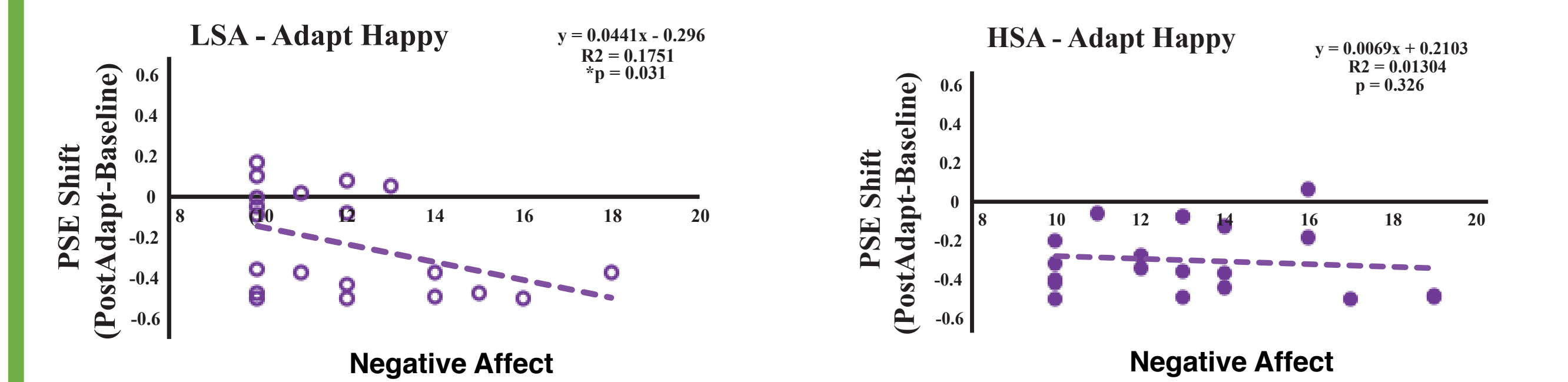


HSA individuals show a significant difference in the *magnitude* of adaptation ($*p = 0.026$): weaker adaptation to negative vs positive emotions.

Negative Affect Influences Adaptation

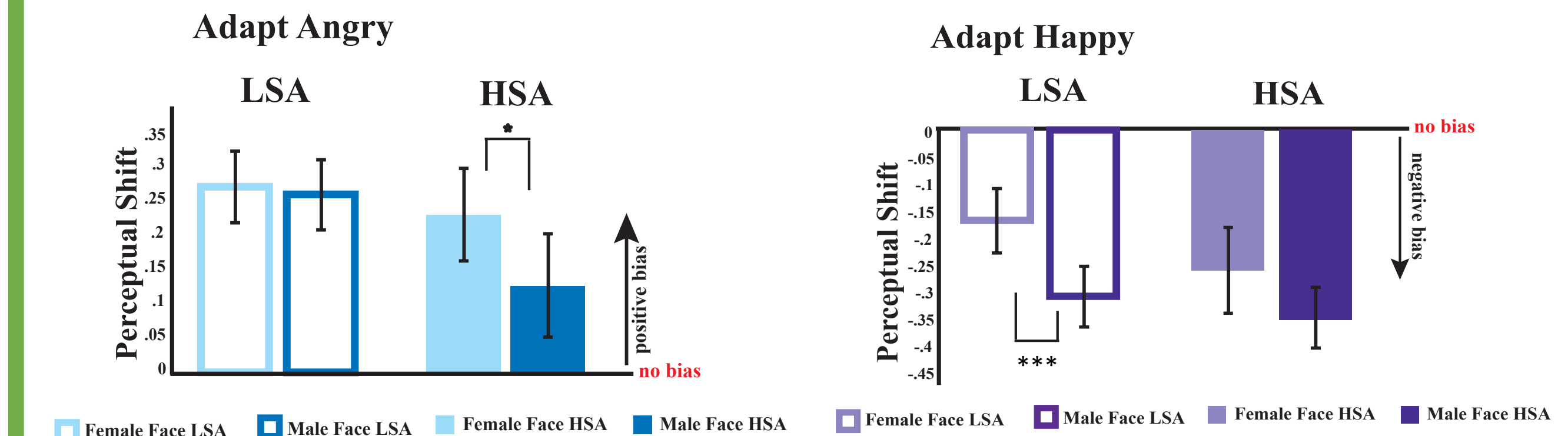


The stronger negative affect, the weaker positive perceptual biases after adapting angry, but only in LSA individuals.



The stronger negative affect the stronger negative perceptual biases after adapting happy, but only in LSA individuals.

Gender Influences Adaptation



Only HSA individuals show weaker adaptation to angry male vs angry female faces ($*p = 0.03$).

Only LSA individuals show stronger adaptation to happy male vs happy female faces ($*p = 0.003$).

Sample References:

Heimberg, R. G., Brozovich, F. A., & Rapee, R. M. (2014). A cognitive-behavioral model of social anxiety disorder. In S. G. Hofmann, & P. M. DiBartolo (Eds.), Social anxiety: Clinical, developmental, and social perspectives (pp. 705–728) (3rd ed.). Waltham, MA: Academic Press.
Yoon, K. L., & Zinbarg, R. E. (2007). Threat is in the eye of the beholder: Social anxiety and the interpretation of ambiguous facial expressions. *Behaviour Research and Therapy*, 45(4), 839–847.

This work was supported by a UMB Dean's Research Fund to vmc.