

Weakened adaptation for negative compared to positive emotions in individuals high in social anxiety

QUESTION: Does social anxiety status bias the strength of adaptation to positive vs negative emotional faces?

Facial expressions represent a crucial source of information about others' emotions, feelings and intentions. Yet, correctly 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, especially those with an ambiguous nature (Heimberg, Brozovich, & Rapee, 2014).

In the current study we used adaptation to quantify how individuals high in social anxiety process emotional information in a face. We expected stronger adaptation to positive compared to negative emotions, and weaker adaptation to angry versus sad faces.

METHODS



emotional continuum (i.e., 80%, 40%, 20%, and 10% happy to neutral with complementary morphs in the sad/angry dimension). They judged each face as happy or angry (Exp. 1), or as happy or sad (Exp. 2). After adaptation to 100% happy, angry, or sad faces they judged the same face 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 (Exp. 1), and happy or sad (Exp. 2).

Determining Social Anxiety Status

We assessed social anxiety status using the Brief Fear of Negative Evaluation (BFNE) and a follow up phone interview screening. Subjects scoring > 25 were categorized as high in social anxiety.



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DATA ANALYSIS

Predictions

PSE at baseline is a 0% morph. After adaptation to happy faces the same morph is expected to appear angrier.



Sample Subjects Experiment 1

PSE at baseline is a 0% morph. After adaptation to angry faces the same morph is expected to appear happier.











Face stimuli were selected from NimStim (Tottenham et al., 2009). Adaptation consisted of 30 unique faces (15 female), 100% happy or angry in Experiment 1, and 100% happy or sad in Experiment 2. Probe images included a subset of the adaptation faces, 8 unique faces (4 female), morphed along an emotional continuum of angry to neutral to happy (80%, 40%, 20% 10% or 0% of a given emotion) or sad to neutral to happy.

RESULTS

PSE

Baseline Biases

Adapt Angry Adapt Happy Adapt Sad Adapt Happy Exp. 1 Exp. 2



At baseline, socially anxious individuals perceive faces more negatively. The face they judge neutral has more positive emotion, seen here as a positive PSE.

Post-Adapt Biases



Post-adapt, socially anxious individuals show stronger adaptation to positive than negative emotions. In Exp. 1, the PSE bias is weaker after adaptation to angry emotions compared to adaptation to happy emotions (p = 0.036). In Exp. 2, the PSE is weaker after adaptation to sad compared to happy (p = 0.00).

Perceptual Shift (Adaptation Effect)



When the change in PSE is normalized for each individual based on their unique PSE biases at baseline, there is a tendency for a weaker magnitude (independent of effect direction) of adapting to angry versus happy faces (Exp. 1; # p = .052), with no tendency for a weaker magnitude of adapting to sad versus happy faces. (Exp. 2; p = .93).



RESULTS



There is a significant difference in slope after adapting to sad versus happy faces (*p = .002), such that adapting to happy compared to sad faces results in a larger increase in slope after adaptation. Thus can be interpreted as a more categorical way of perceiving emotionally charged faces after adaptation.

CONCLUSION: Adaptation is weaker for negative vs positive emotions in socially anxious individuals

• As expected, socially anxious individuals demonstrate a weaker adaptation to negatively compared to positively charged emotional faces. When normalized by individual biases, the strength of adaptation tends to be larger for angry compared to angry emotional information.

 Socially anxious individuals might maintain their negative bias in interpreting social situations and judging emotional information due to a dysfunctional mechanism of adaptation: weakened adaptation to negative emotions or either strengthened adaptation to positive emotions. Future work would need to distinguish between these possibilities.

Sample References:

Heimberg, R. G., Brozovich, F. A., & Rapee, R. M.

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