

# Affective States but not Traits Influence Alternation Rates During Binocular Rivalry

## The Role of Affective States and Traits in Binocular Rivalry of Neutral Stimuli.

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### INTRO

- Alternation rates (AR) during binocular rivalry (BR) of neutral stimuli have been shown to be differentially altered in affective and anxiety disorders (attenuated AR in depression, bipolar disorder and OCD; elevated AR in generalized anxiety disorder (GAD))
- This study aims at disentangling the independent contributions of negative state and trait affective variables

### METHODS

- Participants (current n=21) with varying degrees of depressiveness and trait anxiety (measured via PHQ and STAI) reported their moment-to-moment percept in a BR task (24 trials á 90s)
- State affect was measured through PANAS and manipulated through harmonic music (positive), stressful music (negative) or no music (baseline) prior to the trials
- Stimuli were either gabor patches (control condition; tilted left- or rightwards) or faces (upright vs. inverted) to measure the strength of perceptual bias
- Dependent variables were alternation rates as well as the proportion of time during which participants reported to see the upright vs. the inverted face

### RESULTS

- ARs were significantly higher after participants listened to emotion inducing music ( $F(2,38)=21.28, p<.001$ ). Music valence (positive or negative) had no differential impact on AR
- Higher values in pre-task affective state also show a positive association with AR (positive  $r=.34, p=.13, t=1.57$ ; negative  $r=.44, p=.04, t=2.14$ )
- Neither trait anxiety nor depressiveness showed significant associations with AR during neutral baseline measurements
- Bias towards upright vs. inverted faces is potentially reduced in high negative trait affect (anxiety,  $r=-.29, p=.21, t=1.29$ ; depression,  $r=-.29, p=.21, t=1.30$ ) but more data is needed in order to validate this

### DISCUSSION

- These results cast doubt on previous findings which found AR to functionally differentiate between GAD and depression (Jia et al., 2020)
- They further highlight the importance of considering differences in arousal levels, state affect and psychomotor behavior between different patient populations, as these variables influences variance in BR alternation

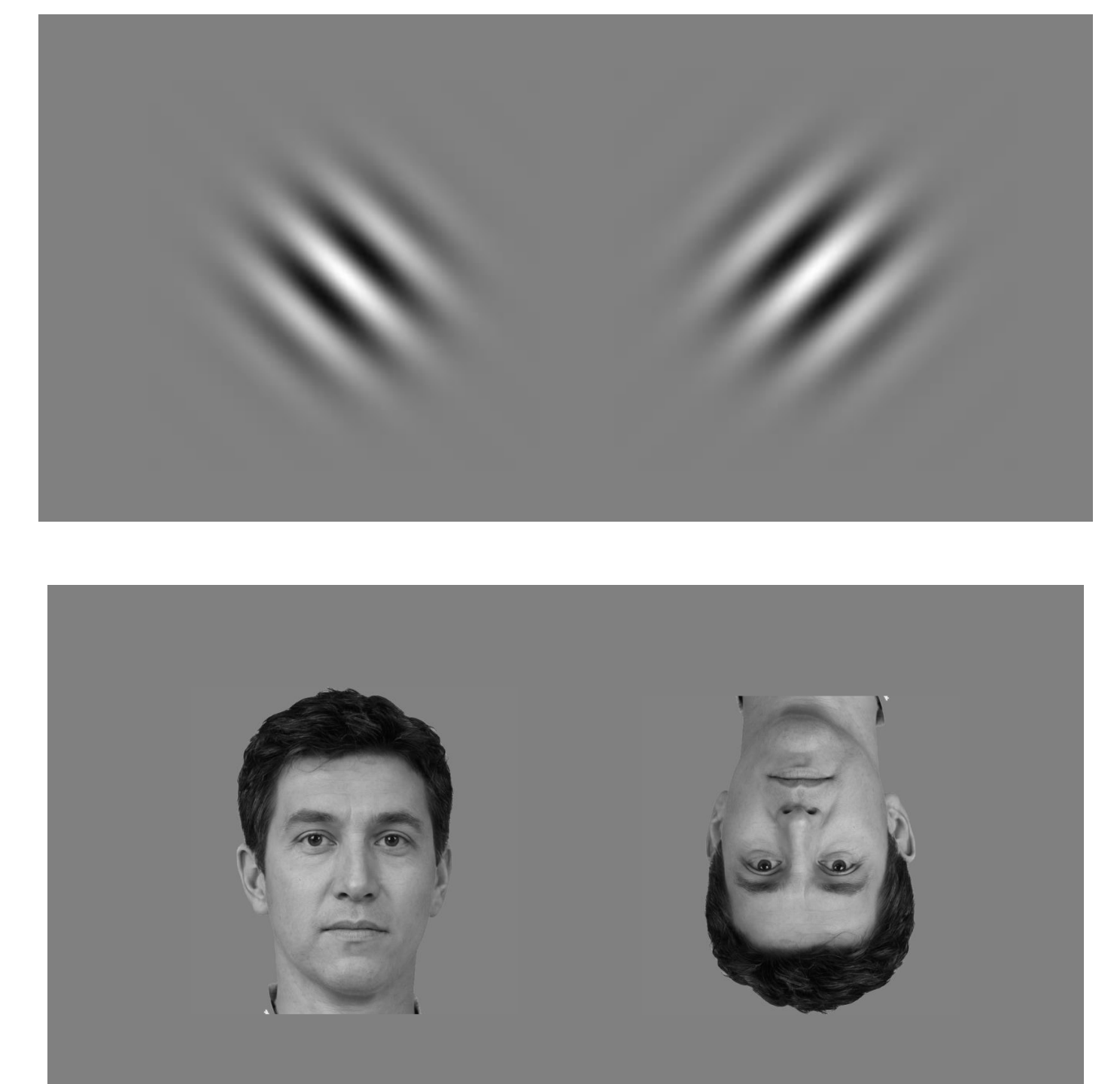


Figure 1: BR Stimuli

Participants see both stimuli through a stereoscope (i.e., left eye sees the left stimulus and vice versa) and are asked to report their conscious percept at any given moment through press of a button.

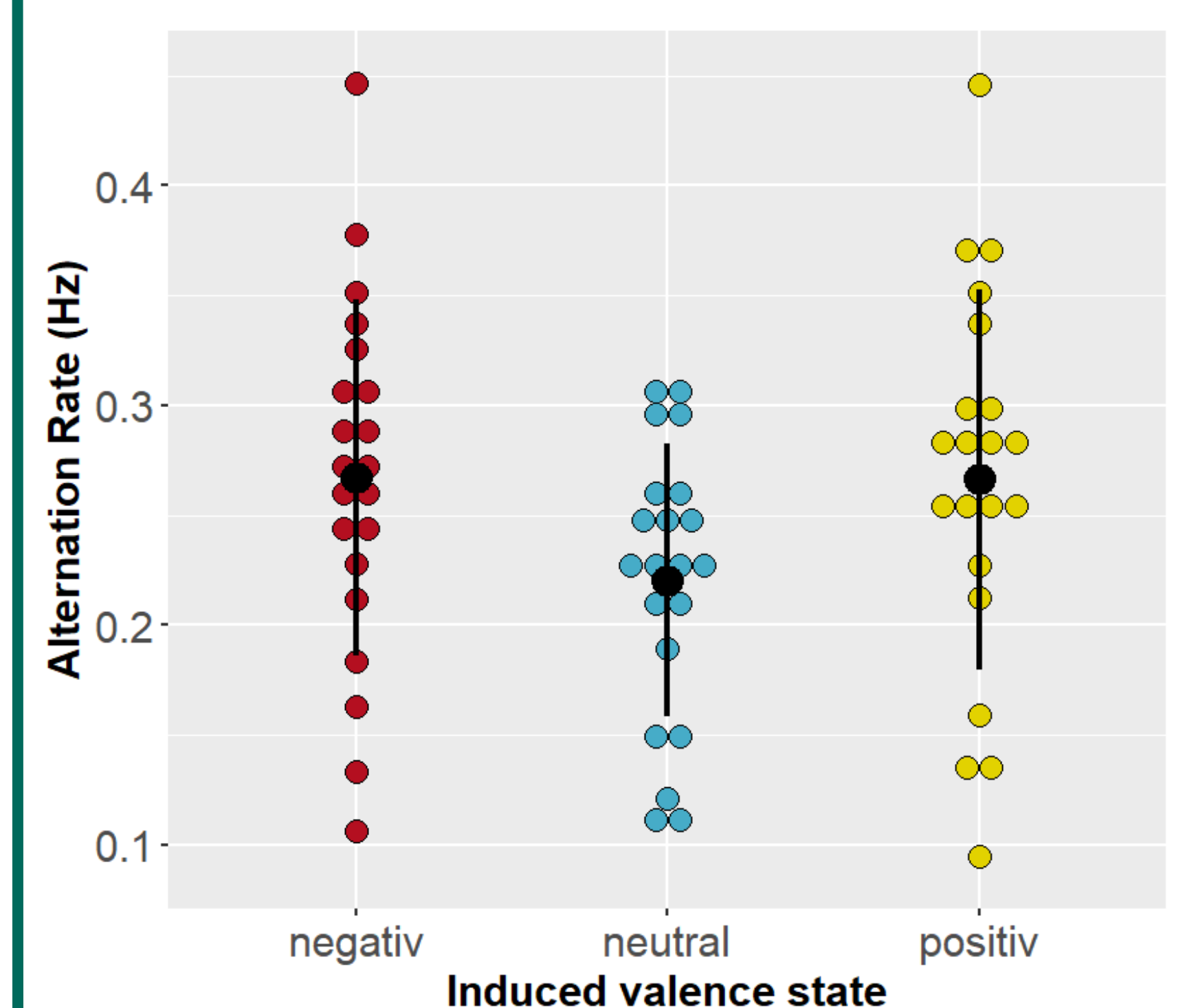


Figure 2: Alternation Rates by Affective Valence Mean alternation rate per participant over both stimuli in the three different valence conditions. Rates are significantly lower under neutral affect and heightened when affective valence is positive or negative.

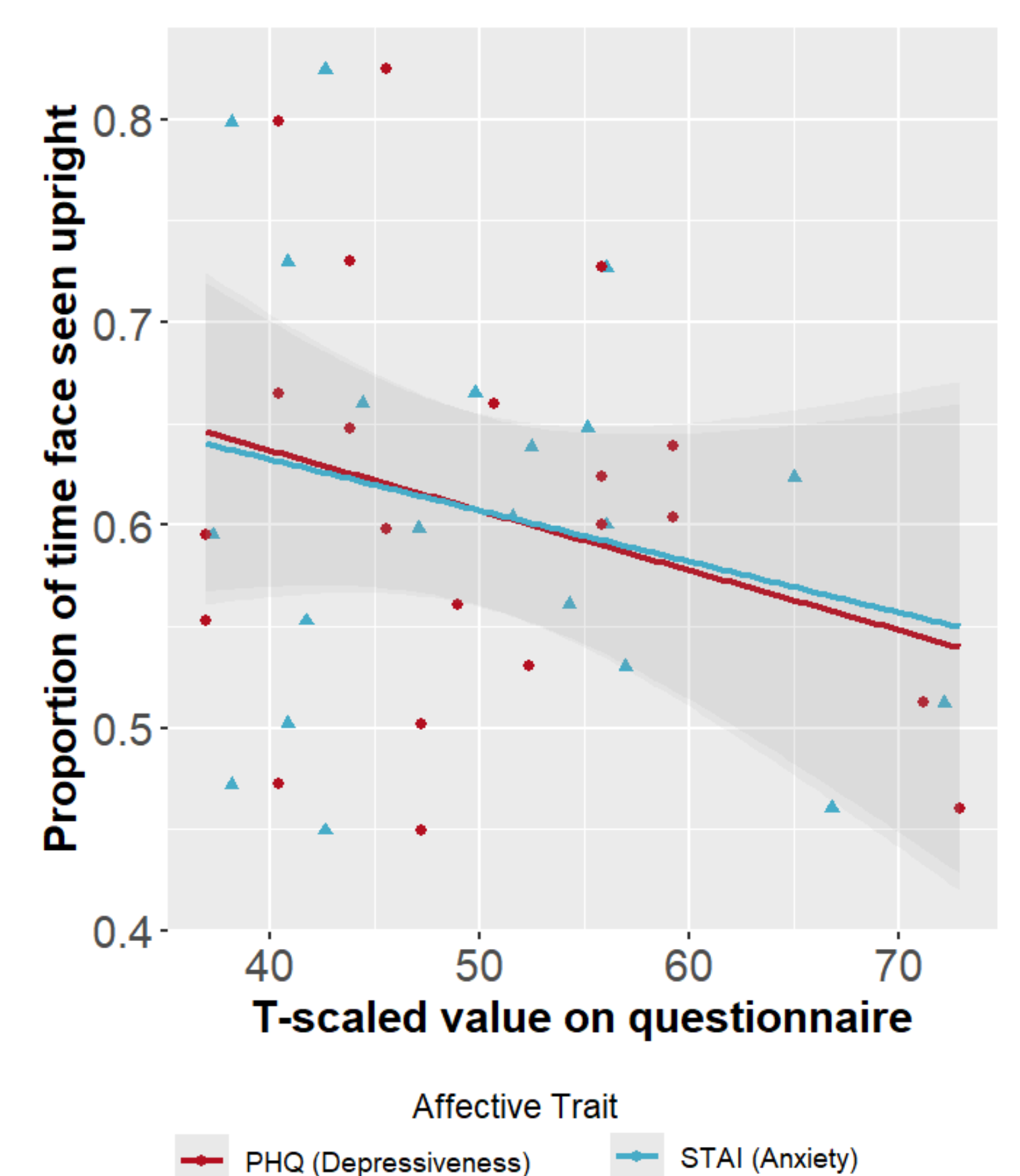


Figure 3: Degree of bias towards upright face

Proportion of time per participant in which upright instead of tilted face was reported. Bias appears to be weaker in more depressed and anxious people although this is not significant. No differential effect of depressiveness and anxiety can be observed

Jia, T., Cao, L., Ye, X., Wei, Q., Xie, W., Cai, C., ... & Wang, K. (2020). Difference in binocular rivalry rate between major depressive disorder and generalized anxiety disorder. *Behavioural Brain Research*, 391, 112704..

