Levels of autistic and social anxiety symptoms do not predict atypical approach-avoidance behavior in response to emotional facial expressions in a typical population

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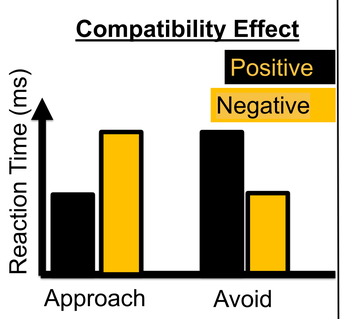
Background

- Effective response to positive and negative stimuli in the environment is crucial for survival and relevant for navigating the complex social world (approaching happy, avoiding angry)
- Compatibility effect: faster when approaching positive stimuli and avoiding negative stimuli than the reverse (Rougier et al., 2018)
- Psychopathologies involving social cognition (e.g., Autism Spectrum Disorders (ASD), Social Anxiety (SA)) often show difficulties in processing valence from social stimuli such as facial expressions (Harms et al., 2011)
- Unclear if individuals with ASD/SA groups show typical similar approach-avoidance behaviors to positive and negative facial expressions



Research Questions

How do levels of psychiatric (ASD, SA) symptoms in a typical population modulate approach-avoidance behavior to emotional facial expressions?

A. Can we replicate the compatibility effect with happy and angry emotional facial expressions in an online approach-avoidance task in the neurotypical population?
B. Is approach-avoidance behavior modulated by levels of autistic and social anxiety tendencies?
C. Do other exploratory measures of reaction time (bias score , D-score) correlate with socio-cognitive functioning?

Methods

Assessment of Social Cognition and Psychopathology Screening
Autistic Symptoms: Autism Quotient (AQ) (Baron-Cohen et al., 2001)
Anxiety: Liebowitz Social Anxiety Scale (LSAS) (Heimberg et al., 1999)

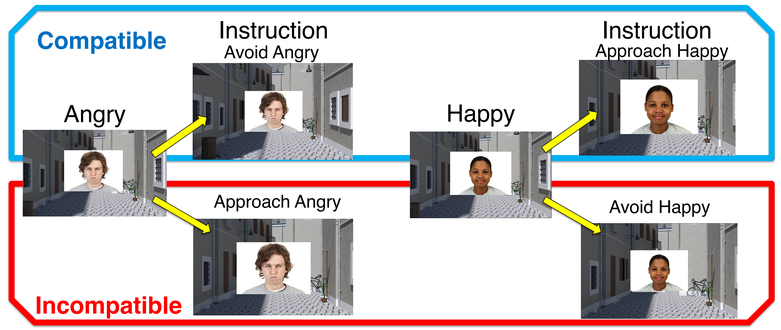
Online visual approach-avoidance by the self task (VAAST) Rougier et al., 2018)
- challenging to measure AA ecological valid in lab (joystick, manikin)
- by pressing key to move forward or backward, as instructed, visual feedback zooms in or out of a street environment

Online Study on Mechanical Turk Platform
Stimuli: emotional faces from the Chicago Face Database (Ma et al., 2015)

Approach-Avoidance Behavioral Measures in VAAST
We used reaction time (RT) scores to create:
compatibility effect (instruction [approach/avoid] x valence [happy/angry])

bias scores: faster to approach positive/avoid negative stimuli than approach negative/avoid positive. $Bias = mRT_{compatible} - mRT_{incompatible}$

D-scores (Greenwald et al., 2003, Fricke et al., 2023) $D\ Score = \frac{(mRTincompatible - mRTcompatible)}{SD}$

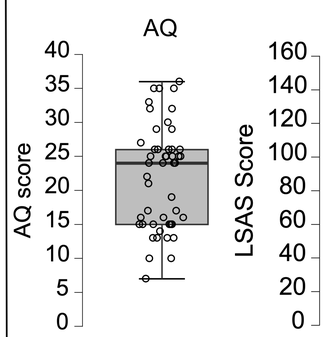


Task Design
16 training trials, 2 blocks (80 trials each), block order counterbalanced
Dependent variables: Reaction times (RT, milliseconds), accuracy (% correct)
Participants with <60% correct trials, RT < 0.45s or > 2.5s excluded

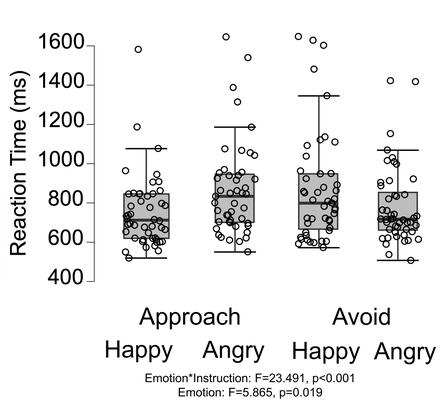
Results

Sample: Mturk, N = 48 (32 female), mean(SD) age: 36.4 (6.9) years

Psychopathology Screening

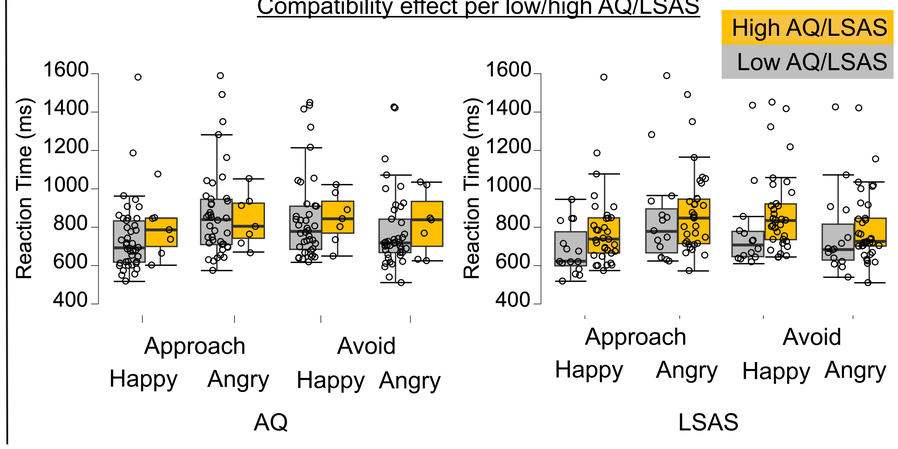


Compatibility effect

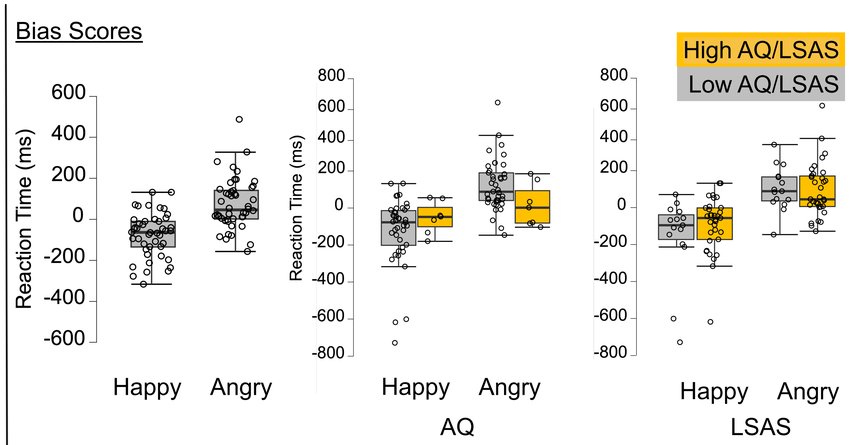


Emotion*Instruction: F=23.491, p<0.001
Emotion: F=5.865, p=0.019

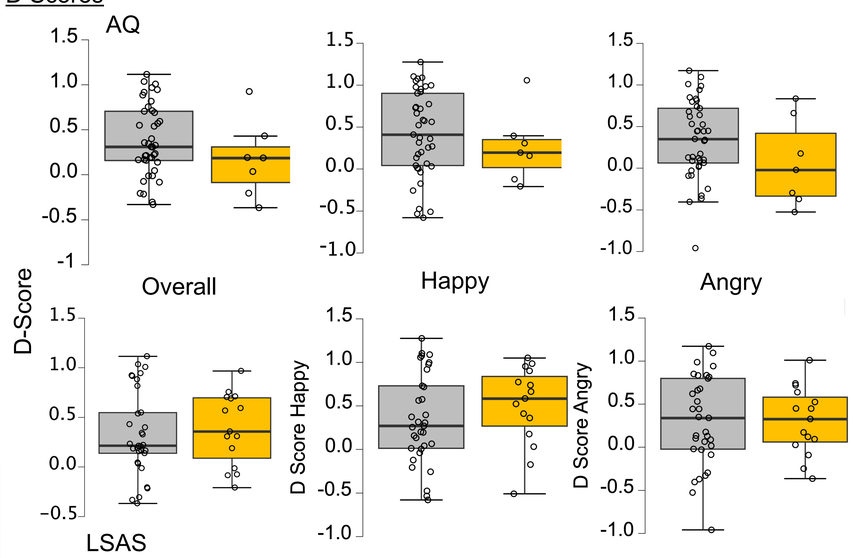
Compatibility effect per low/high AQ/LSAS



Bias Scores



D Scores



Discussion

(A) Online VAAST with emotional faces replicated compatibility effect.
(B) Participants with higher levels of autistic or social anxiety symptoms showed typical compatibility effects.
(C) For bias or d-scores: no statistically significant atypical approach-avoidance behavior for individuals with higher psychopathology levels.
Higher AQ scores seem to suggest lower compatibility effect, bias scores and d-scores. Sample with high AQ may be too small to detect statistically relevant effect.

Next steps
Increase sample size and preregister analyses.
Use more ecologically valid stimuli including
Include diagnostic autistic and social anxiety samples.

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