The Adolescent Brain: Quantifying the relationship between social awareness and perception of upright and inverted faces

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Background

- Faces give us a framework to understand identity, age, and the emotional states of the people around us.[1]
- Social awareness is key to understanding and applying information given in social interactions.
- Differences in social awareness may influence neural biomarkers associated with face perception.

Objective

- The aim of this study was to investigate how individual differences in social awareness and response time may influence N170 amplitude under two different conditions:
  - Upright Faces and Inverted Faces
- We predicted that there would be a positive correlation between higher SRS-2 scores, indicative of more difficulties in social awareness, and larger peak amplitude in the N170 biomarker.
  - In addition, this effect would be emphasized in faces oriented upright opposed to inverted.

Method

	Mean (SD)	n (%)
Age	12.08 (1.27)	
SRS-2 Total Score	53.95 (9.54)	
SRS-2 Social Awareness Score	57.71 (11.34)	
Gender		
Female		25 (43%)
Male		32 (55%)
Other		1 (2%)
Ethnicity		
Hispanic/Latine		2 (3%)
Not Hispanic/Latine		56 (97%)
Race		
Asian		3 (5%)
Black/African American		11 (19%)
White		37 (64%)
More than one race		7 (12%)

- EEG task (Figure 1)
- The Social Responsiveness Scale (SRS-2) is a caregiver report designed to assess emotional dysregulation and social skills.

Figure 1. N170 event related potentials to upright and inverted faces.
Overall, upright faces exhibited larger N170 amplitudes, $F(1, 11494) = 81.9$, $p < .0001$, indicating a more negative response compared to inverted faces.

Elevated SRS-2 scores, reflecting greater challenges in social awareness, were associated with more negative N170 amplitudes to Upright faces. This effect was more pronounced in younger children.

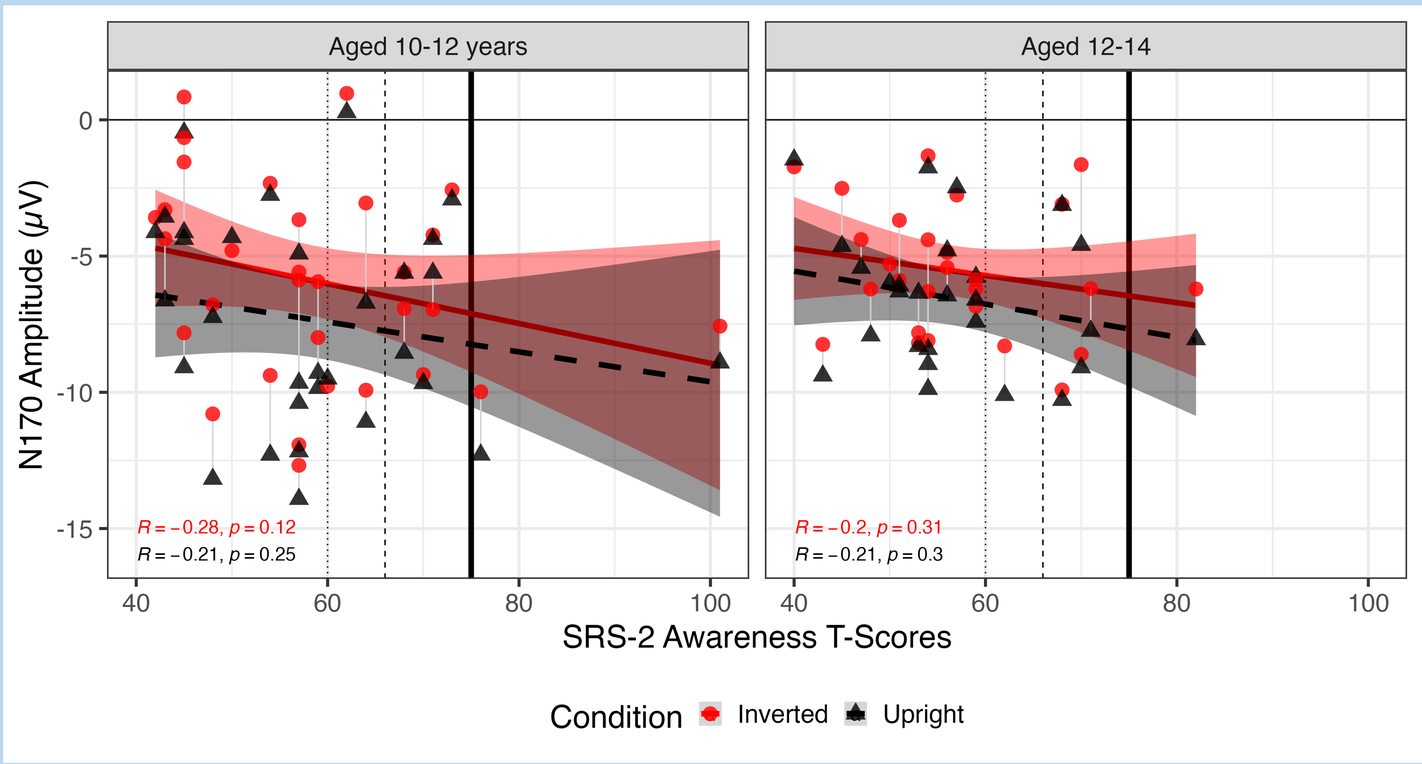

Figure 2. Association of SRS-2 awareness T-Scores with N170 Amplitude. There was a trend between condition, age, and social awareness skills, $F(1,11494)=3.51$, $p= .061$, such that younger children with elevated SRS-awareness scores (i.e., more challenges) had more negative N170 amplitudes to Upright faces, $p = .061$, but not Inverted faces, $p = .72$.

These findings may indicate that more challenges in social awareness, especially in younger children, lead to greater sensitivity to face perception. Future studies examining social awareness and neural biomarkers of face perception across development may help to better explain the relationships between these variables.

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References :
1.de Haan et al., (2002). *Journal of Cognitive Neuroscience,14(2),* 199-209.