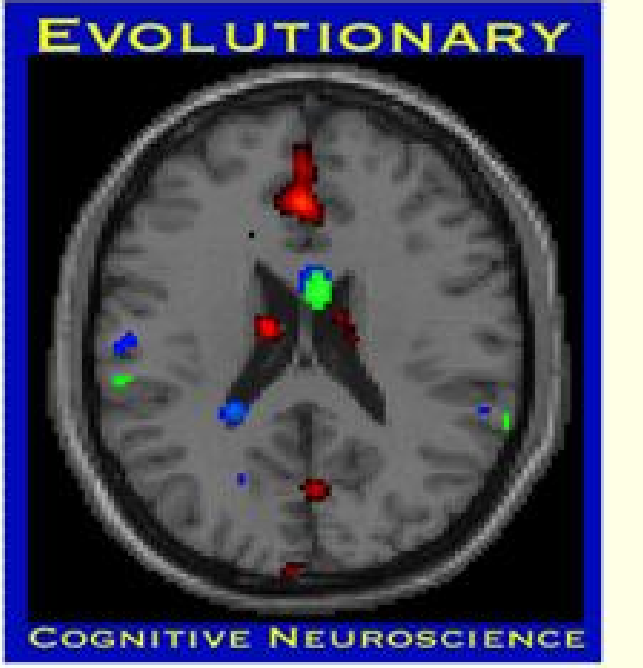


Impact of autistic spectrum pathology on self-face recognition: A pilot study of children with Asperger's Syndrome



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Abstract:

Objective : The autism spectrum disorders are characterized by deficits in social behavior that have been hypothesized as being related to deficits in self-processing. A growing number of studies have linked the right hemisphere to self-processing. We therefore hypothesized that children with Asperger's syndrome would perform worse at self-face recognition, and show specific impairments with their left hand, which may be a marker for right hand processing.

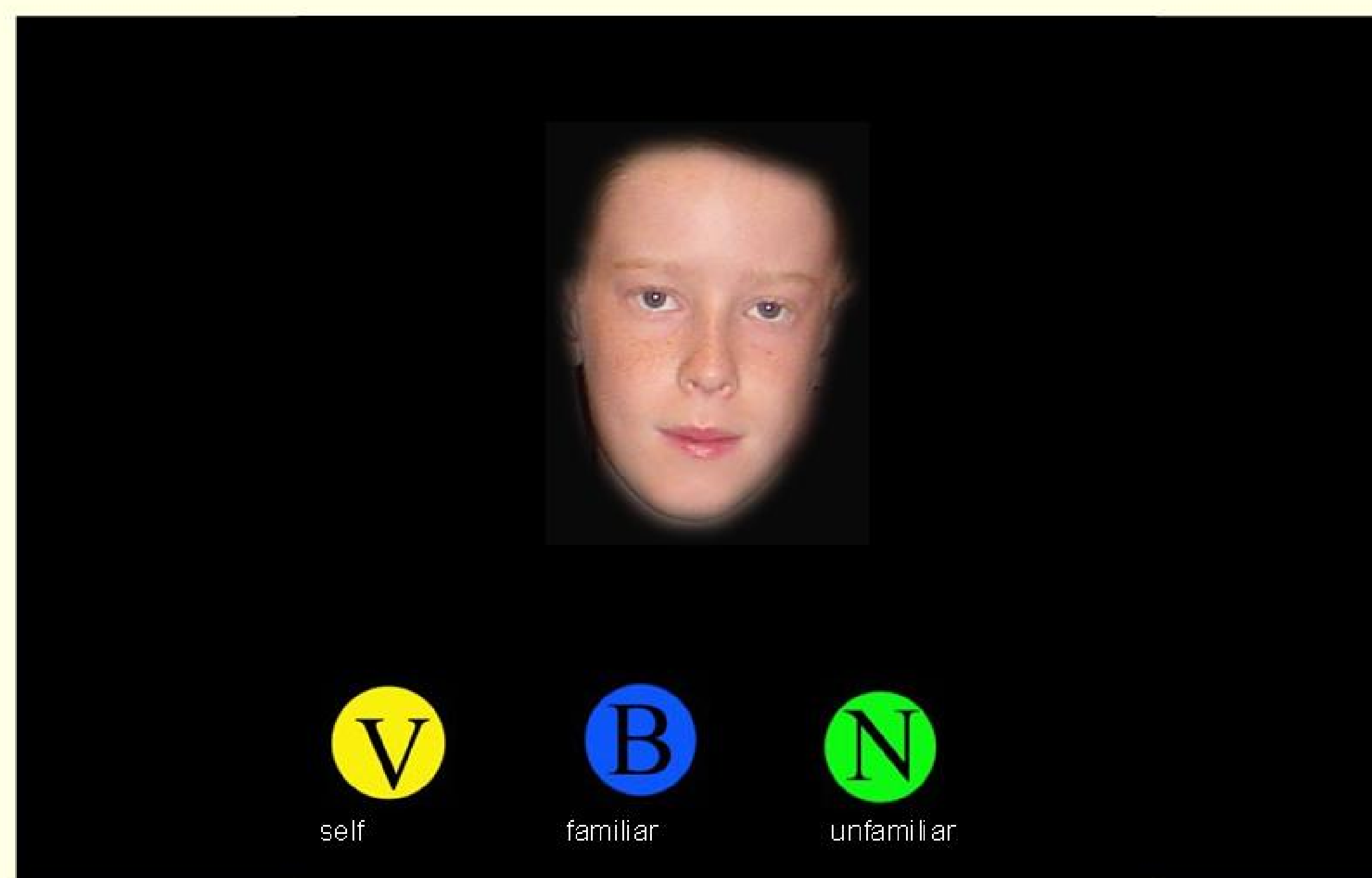
Participants and Methods : In a pilot study, eight Asperger's diagnosed children (aged 8 to 11 yrs) took a computerized face recognition test. They responded using both hands to self-, familiar (first degree relative), and unknown faces when presented on the computer.

Results : Subjects were quicker to recognize self-face with their right than left hand. Also subjects were less accurate at identifying a self-face in comparison to a familiar-face with their right hand, but no different when responding with their left hand.

Conclusions : These findings suggest that lateralization of self-processing may be impacted by autistic spectrum pathology since the right hemisphere is more accurate while the left hemisphere works quicker to recognize the self.

Introduction

- Asperger's Syndrome is characterized by social impairments and repetitive/restricted behaviors, however it is not associated with communication problems or cognitive impairments as is seen in Autism.
- Self-recognition including autobiographical memory and self-face identification is correlated to activity in the right frontal lobe (Keenan, 1999, 2000, 2001).
- Processing of faces is considered to occur in the right hemisphere (Ashwin, 2005).
- Subjects identified their own faces faster than other faces when responding with their left hand indicating self-recognition is processed in the right cortical hemisphere (Keenan, 1999 in Platek, 2002).
- Asperger's children tend to process faces using detail instead of holistically, how healthy individuals process (O'Connor, 2005).
- Similarities have been noted between the behavior of people with Asperger's Syndrome and people with right hemisphere damage (Ashwin, 2005).
- Increased speed of processing in self-face recognition tasks illustrates one's capacity for self-awareness (Keenan, 2001).
- Recognition of self as well as familiar and other faces is fundamental to basic social interaction (Gallup, 1982; Platek et al., 2004).



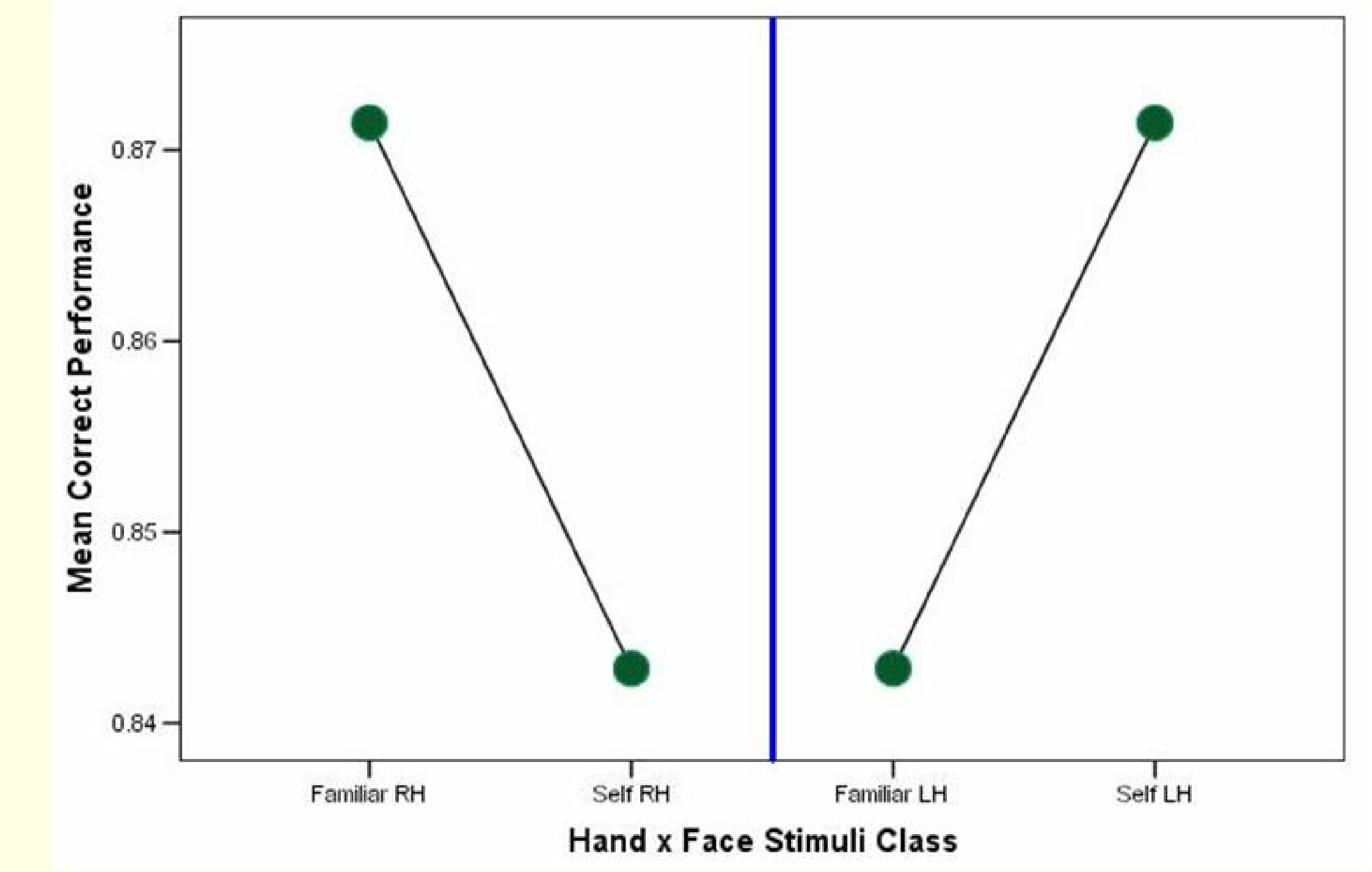
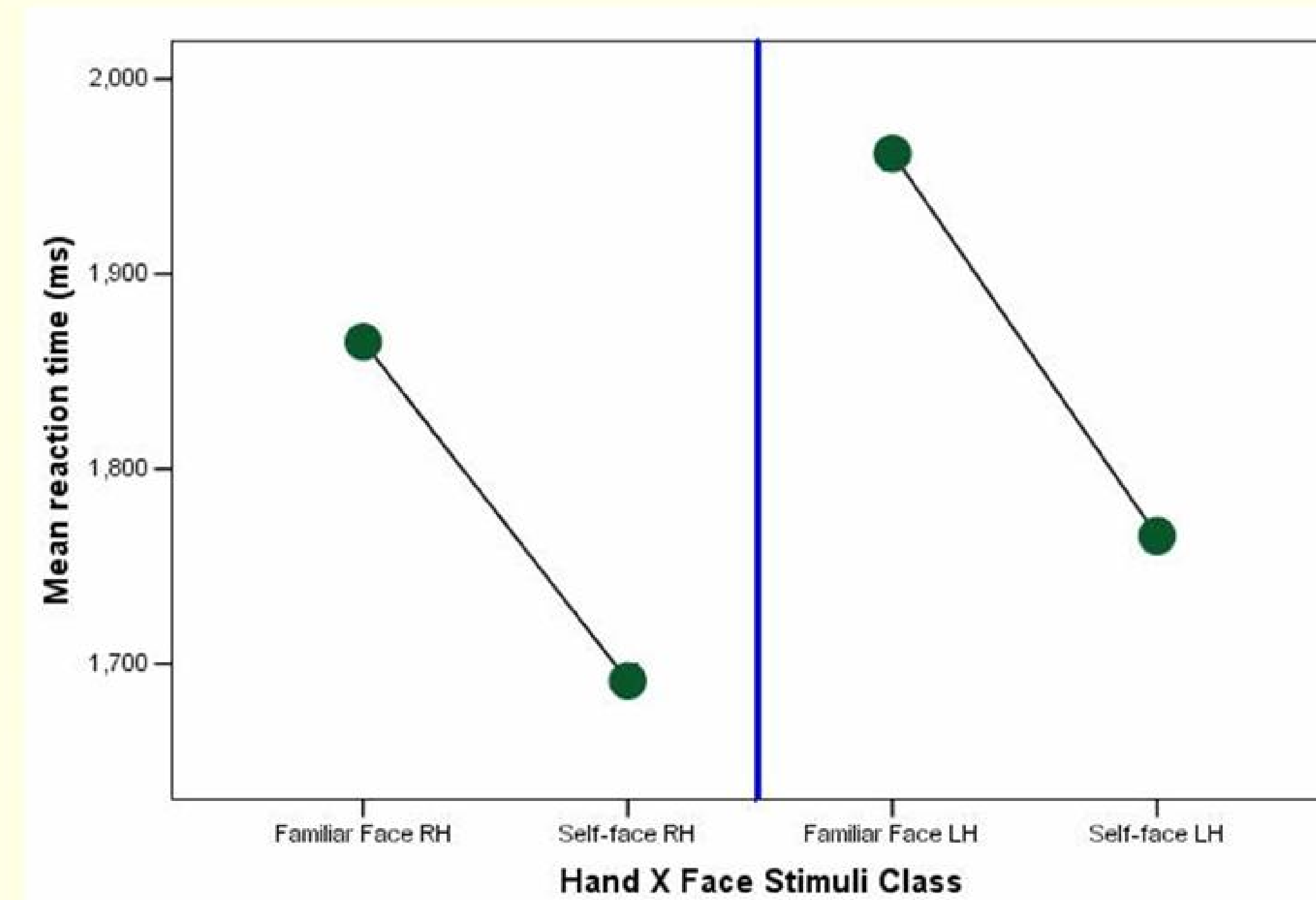
Methods

Subjects: Male children aged 8-11 previously diagnosed with Asperger Syndrome and were recruited from Dr. Daniel LeGoff's Neuropsychology practice at Bancroft Brain Injury Services for participation in this pilot study

Procedure:

- Participants had their picture taken, showing no facial expression with an HP 315 PhotoSmart digital camera.
- A photo of a first degree relative was also then taken (siblings were preferred relatives) to serve as the familiar face.
- Both photos were cropped so that only the face (no hair) was seen.
- The self photo and the familiar photo were combined into a data base of other photos (males age ranged 8-12).
- The faces were presented at random to the subjects on a computer screen, subjects then used color coded keys to select self, familiar, or other face.
- Subjects completed the task with each hand twice for a total of 120 face presentations per hand

Results



- Subjects were quicker to recognize their self-face than a familiar face and quicker in general when using their right hand vs. their left hand.
- Subjects were more accurate in identifying their self-face in comparison to a familiar face when using their right hand and more accurate in identifying a familiar face in comparison to a self-face when using their left hand.
- Note: Due to limited number of subjects and no control subjects, only trends were shown.

Conclusion

- While existing data on healthy controls process self-face using the right hemisphere, the subjects with Asperger's were more accurate with left hemispheric processing.
- While healthy individuals are faster processing self-face with their left hand, subjects in this study were faster when responding with their right hand.
- These points show that individuals with Asperger's Syndrome process faces differently than healthy controls indicating a possible altered lateralization in their brain development.
- With more participants and control data we expect the tendencies shown in the pilot data to achieve significance.
- Future directions in this research will investigate the consistency of the performance and reaction times on this task in relationship to brain imaging, specifically fNIR technology.