**BACKGROUND**
Individuals with autism spectrum disorders (ASD) exhibit difficulty interpreting facial cues in order to understand the thoughts, mood states, beliefs and intentions of others. This problem has been linked to diminished eye gaze and the subsequent reduction in activation of the "social brain" circuitry which is used to process affect (e.g. amygdala) and face information (e.g. fusiform gyrus), and is involved in theory of mind skills (prefrontal cortex and superior temporal sulcus). We used eye tracking and functional magnetic resonance imaging (fMRI) to compare responses to social cues (eye gaze) and nonsocial cues (arrows) by individuals with ASD and neurotypical controls (NT).

**METHODS**
**Participants:** 8 HFA and Asperger’s D/O and 11 neurotypical controls ranging in age between 18 and 35 years participated.

**Stimuli & Procedure:** Participants were scanned in a 3T magnet and their eye movements were recorded as they performed a simple two-alternative forced-choice task. They were shown a series of pictures and for each one they were asked to make a judgement about the direction of an arrow (arrow-object condition) or that of a person’s gaze (person-object condition).

**RESULTS**
**Behavioral Data:** ASD subjects did not differ significantly from NT controls when making arrow-object judgements (see below).

![Performance on Arrow Object Task](image)

However, ASD subjects performed significantly worse than NT controls on the person-object task (see below).

![Eye Tracking Data: ASD subjects tended to produce a less focused pattern of fixations and shorter dwell times than did NT controls. Shown below are the eye scan patterns that are representative of the same, recorded during the arrow object condition](image)

**DISCUSSION**
Taken together, these results suggest that individuals with ASD do not process visual cues in the same way that neurotypical individuals do. This difference is particularly marked for visual cues that involve faces. The interpretation of facial cues elicits poorer performance, less focused visual attention, and less brain activation in individuals with ASD than in neurotypical controls. Future work is underway to determine how the integration of brain areas underlies these processing differences.

**ACKNOWLEDGMENTS**
The authors would like to thank the NJ Governor’s Council on Autism and the McDonnell Foundation for their support.