Investigating Face Perception and Face Memory in Autism
Katie Brown¹, Mirta Stantić¹, Caroline Catmur², Geoff Bird¹,²
¹ University of Oxford, ² Kings College London

**Importance & Questions**
- Facial recognition deficits have been proposed to underlie the social communication deficits in autism spectrum disorder (ASD), but research on whether facial recognition is impaired in ASD is extremely mixed.
- Here, we use a range of standard measures and a novel measure of face recognition to investigate:
  1. Whether face perception and face memory are impaired in ASD
  2. If face perception is impaired, why do people with ASD perform worse on these tasks?

**Method**
- 57 participants with ASD (25 female; age: 42.0±13.4) and 57 neurotypical matched controls (28 female; age: 41.8±9.3) completed:
  - The Oxford Face Matching Test (OFMT)
  - The Glasgow Face Matching Test (GFMT)
  - The Cambridge Face Memory Test (CFMT)
  - The 20-item Prosopagnosia Index

**OFMT:**
- Participants judge whether the face pair depicts the same person or two different people & rate the perceptual similarity of the two faces.

**CFMT:**
- Participants learn a face and later pick out the learned target identity among two distractors.

**GFMT:**
- Participants judge whether the face pair depicts the same person or two different people.

**Results**

**Group Differences**
- Performance of the ASD group was significantly lower than the neurotypical (NT) group on:
  - the OFMT, \( t(112) = -2.85, p = .005 \)
  - the GFMT, \( t(112) = -2.69, p = .008 \)
  - the CFMT, \( t(112) = -3.73, p < .001 \)

Group is not a significant predictor of face memory when controlling for face perception

**Deviation Scores (DS)**
- DS = abs(algorithm estimate - participant estimate)
- Similarity estimates from the ASD group deviate significantly more from algorithm-derived estimates than the NT group, \( t(112) = 2.74, p = .007 \)
- Regression predicting score from DS, group & the DS*group interaction.
- Identical patterns for OFMT, GFMT and CFMT scores:
  - DS is a significant predictor (\( \beta = -0.619, p < .001; \text{OFMT} \))
  - Neither group nor the deviation x group interaction is a significant predictor

**Conclusions**
- ASD group perform worse than NTs on tasks of both face perception and face memory, but some individuals perform just as good or better.
- Variance in performance on face memory is accounted for by face perception
- ASD group less able to objectively assess the similarity of two faces, and this ability is a stronger predictor of face matching than group.
- Results suggest that perceptual representation formation is impaired in ASD and this underlies poorer performance on face matching tasks.