Visual Cognition in Autism: Autistic adults are better at "spotting the difference"

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Background

- Autism spectrum conditions (ASC) are associated with superior attention to detail [1], heightened drive to "systemize" (i.e, to identify if-and-then rules in a system) [2], and enhanced perceptual function [3].
- Visual processing, in particular, serves as a useful tool to investigate the characteristic sensory and cognitive profile of ASC [4].

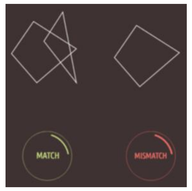
Aims

To examine visual cognition in autistic (ASC) vs typical control (CTR) adults by means of web-based cognitive tasks.

Methods

- 140 ASC (82 females) & 147 CTR (118 females).
- Aged 18-60 years, no significant group differences in age; ASC (m: 35.1, sd: 9.85) & CTR (m: 35.8, sd: 9.85).

- Recruited via the *Cambridge Autism Research Database*
- Behavioural tasks probing working memory and visual perception completed online via *Cambridge Brain Sciences*



Polygons: A pair of overlapping polygons on one side of the screen; indicate whether a polygon on the other side of the screen is identical ("match") or not identical ("mismatch") to one of the interlocking polygons.

Feature Match: Two grids on the screen, each containing an array of abstract shapes; indicate whether or not the grid's contents are identical ("match") or not identical ("mismatch").

- Working memory performance cut-offs computed for each group at 2 SD's below each group mean
- 2x2 Factorial ANOVA on accuracy rates with group (ASC vs CTR) and task condition ("match" vs "mismatch") as factors

Results

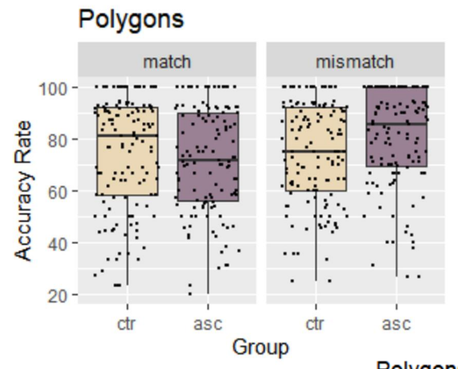
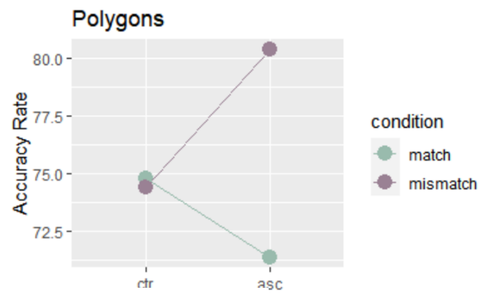


FIG.1: Polygons mean accuracy rates across task conditions

FIG. 2: Polygons 2x2 ANOVA: significant group-by-task condition interaction (F(1)=7.08, p= 0.008*)



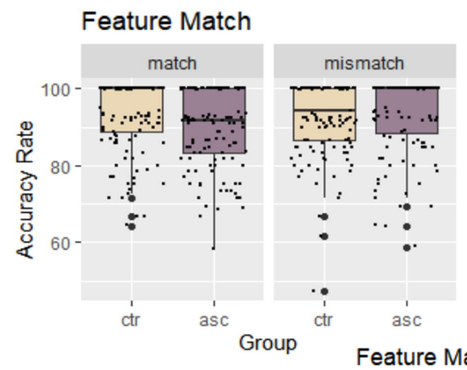
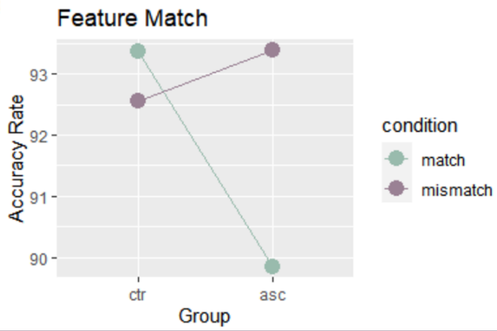


FIG. 3: Feature Match mean accuracy rates across task conditions

FIG. 4: Feature Match 2x2 ANOVA: significant group-by-task condition interaction (F(1)=6.63, p= 0.010*)



Results

- **Polygons:** ASC showed higher mean accuracy rates in the "mismatch" condition of the Polygons task (FIG1). The 2x2 ANOVA on Polygons accuracy rates showed a significant group-by-task condition interaction (F(1)=7.08, p= 0.008*) (FIG 2).
- **Feature Match:** Accuracy rates were high across both groups, with ASC showing more ceiling effects on the "mismatch" condition (FIG 3). The 2x2 ANOVA on *Feature Match* accuracy rates revealed a significant group-by-task condition interaction (F(1)=6.63, p= 0.010*) (FIG 4).

Summary

- Autistic adults, when compared to typical controls, made significantly more correct responses in the "mismatch" conditions of web-based visual cognition tasks, i.e., autistic individuals were found to be better at identifying subtle differences between stimuli.
- These findings lend support to a large body of evidence of distinct autistic perception, notably in the visual domain [5].

References

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Participate in online research!

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