

## Introduction

- Recent developments suggest that alexithymia, and not autism, is responsible for the emotion recognition difficulties often documented in the autistic population.<sup>1,2</sup>
- Whilst research has not yet elucidated the mechanisms behind its involvement, there are speculations that being high in alexithymic traits results in more variable representations of emotion, thus leading to poorer emotion recognition accuracy.

## Aims

- To determine whether autistic and/or alexithymic traits contribute to more variable (or less precise) emotion representations and reduced emotion recognition accuracy respectively.

## Participants

- 25 autistic and 25 non-autistic adults matched on age, gender, non-verbal reasoning ability and alexithymia.

## Methodology

- Participants completed two tasks which employed dynamic point light displays of angry, happy and sad facial expressions (PLFs; see Figure 1).



Figure 1. An example of a static PLF

### Task 1: PLF task<sup>3</sup>

- On each trial, participants viewed a PLF and rated the extent to which the expression looked angry, happy and sad.
- Emotion recognition accuracy was calculated as the correct emotion rating minus the mean of the two incorrect emotion ratings.

### Task 2: Emotion representation task

- On each trial, participants viewed a PLF and were required to manipulate its speed (by moving a slider) until the PLF moved at the speed of a typical angry, happy or sad expression.
- Variability was calculated as the standard deviation of the speeds attributed to angry, happy and sad PLFs respectively.

### Questionnaires:

- Autism Quotient (AQ)
- Toronto Alexithymia Scale (TAS)

## Results

### Linear Mixed Effects Models

Accuracy ~ Variability + (1 | Subject) + (1 | Age) + (1 | Gender) + (1 | NVR)

- Accuracy predicted by variability [t(72.54) = -3.42, p < .01]

Two linear mixed effects models with accuracy and variability as outcome variables and total AQ and TAS score as predictors

- Accuracy predicted by total AQ score [t(95.13) = -2.56, p < .05] and not total TAS score. [p > .05]
- Variability not predicted by total AQ or total TAS score [both p > .05]

Two linear mixed effects models with accuracy and variability as outcome variables and the AQ and TAS subscales as predictors

- Accuracy not predicted by any subscales [p > .05]
- Variability predicted by TAS EOT score [t(51.04) = 3.148, p < .01] and AQ Imagination [t(48.48) = 2.07, p < .05]

### Mediation analyses

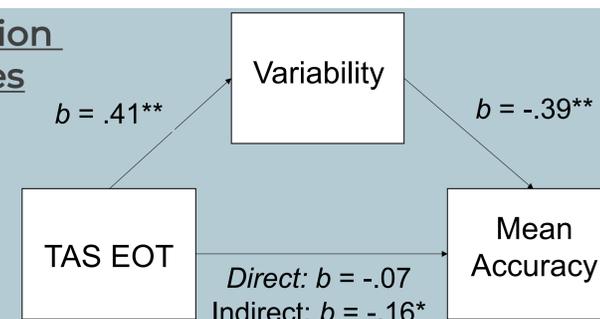


Figure 2. Mediation analysis predicting Mean Accuracy with TAS EOT and Variability. \*p < .05, \*\*p < .01

- TAS EOT, but not AQ Imagination score exerted an indirect effect on accuracy via variability

## Discussion

- Our results illuminate the presence of two 'pathways' to emotion recognition difficulties (see Figure 3).

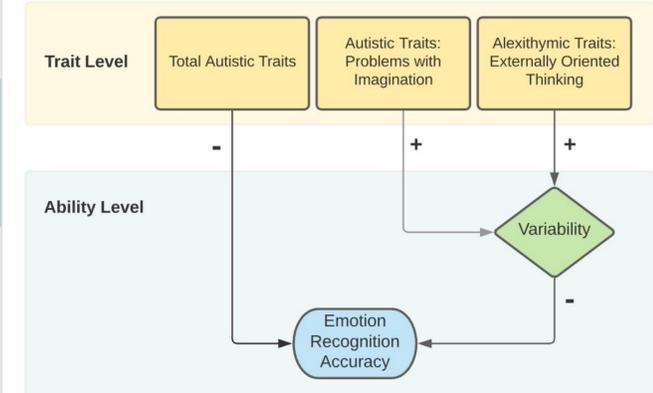


Figure 3. A diagram to show two potential 'pathways' to emotion recognition difficulties.

- On one hand, being high in autistic traits directly contributes to lower emotion recognition accuracy.
- On the other hand, being high in certain alexithymic traits (externally oriented thinking) contributes to greater variability, which in turn results in lower accuracy.
- Those with poorer imagination (high AQ Imagination scores) also showed higher variability.

### References

- <sup>1</sup>Bird, G., & Cook, R. (2013). Mixed emotions: the contribution of alexithymia to the emotional symptoms of autism. *Translational psychiatry*, 3(7), e285-e285.
- <sup>2</sup>Cook, R., Brewer, R., Shah, P., & Bird, G. (2013). Alexithymia, not autism, predicts poor recognition of emotional facial expressions. *Psychological science*, 24(5), 723-732.
- <sup>3</sup>Sowden, S., Schuster, B. A., Keating, C. T., Fraser, D. S., & Cook, J. L. (2021). The role of movement kinematics in facial emotion expression production and recognition. *Emotion*.