

## Research Update

From the Cerebra Centre for Neurodevelopmental Disorders, University of Birmingham

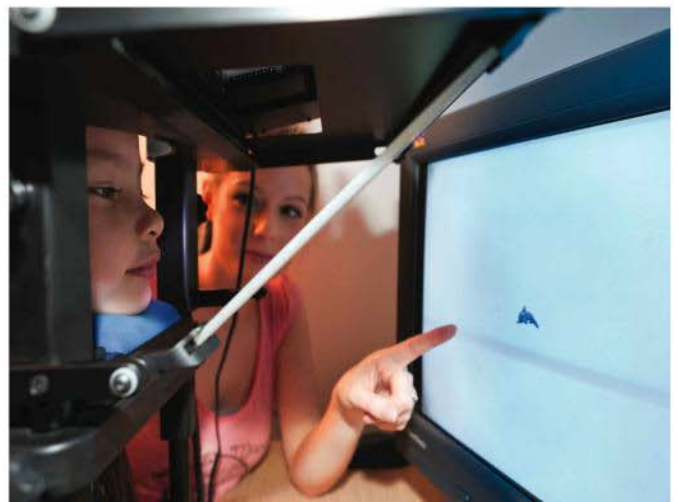
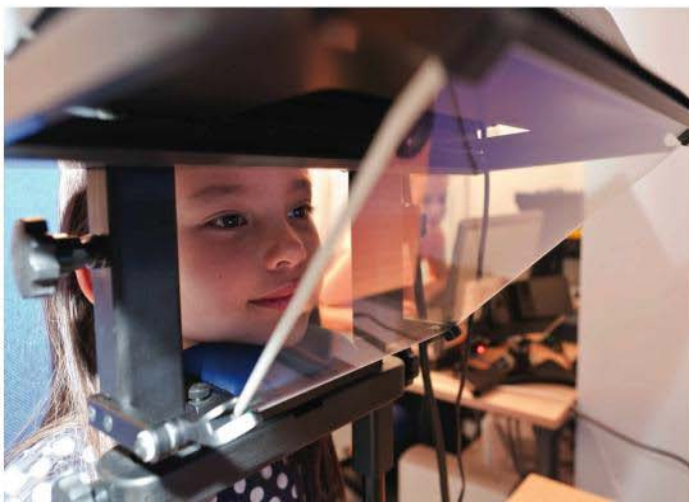
Hayley Mace, a PhD student funded by the Economic and Social Research Council, conducted an eye-tracking study supervised by Dr. Joe McCleery, Dr. Jo Moss and Professor Chris Oliver. The aim of this study was to increase our understanding of social skills in individuals with fragile X. On behalf of everyone at the Cerebra Centre, thank you to those families who took part in this study.

### What is eye tracking and why use this in Fragile X research?

Eye tracking studies use special equipment which can tell us where someone is looking when viewing different pictures on a computer screen. This research can tell us how individuals with fragile X process different information. For example, we can see what grabs people's attention by seeing what they look at first. We can also see what information people are processing because the longer you look at something, the more you process it.

Eye tracking can also tell us about automatic processes. For example, previous studies have shown that individuals with autism spectrum disorders can pass certain tasks but eye-tracking shows that these responses don't come automatically as they do not look at the information needed to pass the task. This means they use different processes than typically developing individuals to pass the tasks.

Hayley investigated how individuals with fragile X process social cues when viewing faces. This research can indicate how individuals with fragile X might process information during social interactions which may have an impact on their social interaction skills.



*Hayley Mace conducting her eye-tracking research*

## Background to the study

Previous literature has suggested that individuals with fragile X can recognise different emotional expressions. These studies have often used tasks which require an explicit response such as a verbal answer or pointing to a picture. Our aim was to investigate more 'automatic' processes using eye-tracking equipment.

Previous literature has also suggested that individuals with fragile X do not look at the eyes of faces as much as those without fragile X. A lot of emotion is expressed through the eyes and it is unclear whether individuals with fragile X could automatically discriminate between emotions if they are not looking at the eyes as much.

## What did this study involve?

Individuals who had agreed to be contacted by the Cerebra Centre were contacted directly about the possibility of taking part in this study. The Fragile X Society contacted some local people, and included information in their newsletters so people could contact Hayley directly if they wanted to discuss taking part.

During this study, two faces were presented simultaneously on a computer screen. Most of the time, these faces displayed a neutral facial expression. In some cases, one of the faces displayed a happy or disgusted expression whilst the other face displayed a neutral expression. For this study we collected data from 14 typically developing girls and boys under 10 years, 12 typically developed females aged between 18 and 25; and 13 children and adults with fragile X syndrome (12 males and 1 female) aged between 6 and 34 years.

## Results

The preliminary results of this study showed that typically developed adults looked at both the happy and disgusted faces longer than the neutral faces. This suggests that they are spontaneously discriminating between these emotions.

The results also showed that typically developing children looked longer at the disgusted face than the neutral face. They also looked at the happy face the same amount as the neutral face. This suggests that they were not spontaneously discriminating between happy and neutral faces.

Individuals with fragile X showed the same looking patterns as typically developing children. They discriminated between disgust and neutral faces but not happy and neutral faces. This suggests that spontaneous discrimination of happy faces is a skill which develops with age and ability and is not a fragile X-specific impairment.

## Conclusions

Individuals with fragile X may not automatically discriminate between happy and neutral faces but other literature suggests that they can recognise happy expressions when they are asked to point to them. This suggests that people with fragile X use different mechanisms to typically developing individuals to recognize happy expressions and it might just take a little longer for them to do this.

It is a common finding for individuals with fragile X not to look at the top half of a face as much as typically developing children. Our future research will aim to look at this, and social behaviour, in natural settings.

## Key points

- This study investigated spontaneous face and emotion processing in individuals with fragile X.
- Individuals with fragile X automatically discriminated between disgusted and neutral faces but not happy and neutral faces.
- Typically developing children showed the same results, suggesting that automatically discriminating happy faces from neutral faces is a skill that develops with age and ability.
- Individuals with fragile X appear to look more at the mouth and nose than the eyes. Typically developed adults seem to look more at the upper half of the face than they do at the mouth.