

fMRI activation of the fusiform gyrus and amygdala to cartoon characters but not to faces in a boy with autism

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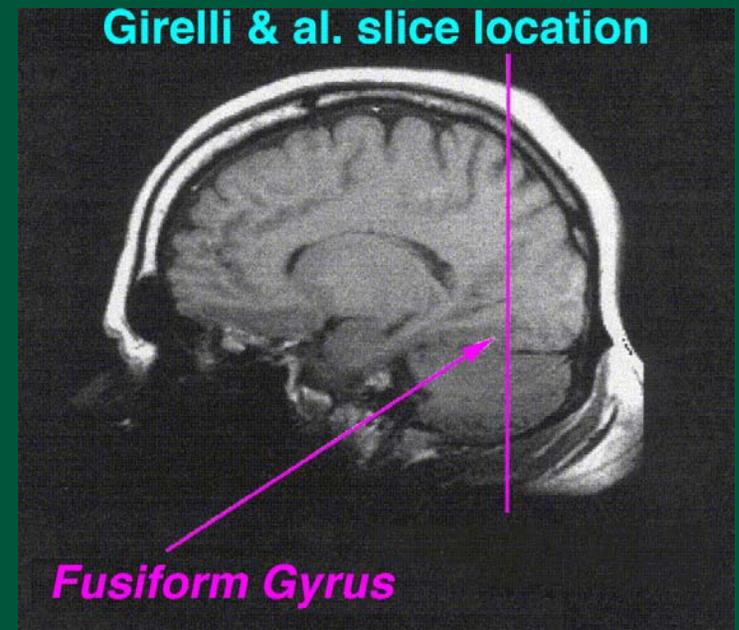
Introduction

- **Autism is a disorder characterized by difficulties in face perception, which is believed to be related to social impairment**
- **Hypoactivation of the fusiform gyrus (FG) and amygdala when presented with faces**



Introduction

- People with autism tend to develop strong and very specific interests
- When experts on objects or animals see their area of expertise it can also activate the FG



Will the FG and amygdala of a person with autism be significantly activated by their area of interest?

How much more so than faces or typical objects?

Subjects

- **“DD”, an 11 year old autistic boy with a very strong interest in “Digimon” cartoon characters**
- **“TDC”, a 10 year old typically developing boy with an interest in “Pokemon” (similar to Digimon) cartoon characters and mild interest in Digimon**
- **“CC”, a 17 year old autistic boy with no interest in Digimon**

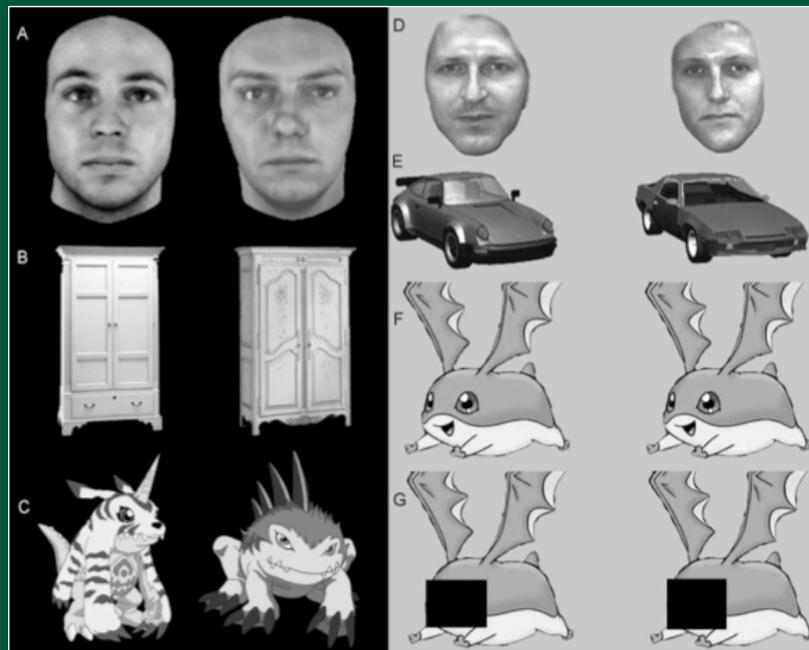
Methods

- **Forced choice verification task:**
- **DD and TDC were shown a picture of either a familiar face, familiar nonface object, Digimon, and for TDC only, Pokemon and given a label saying what the picture was while asked to determine if the label was true or false**
- **Reaction time was measured**



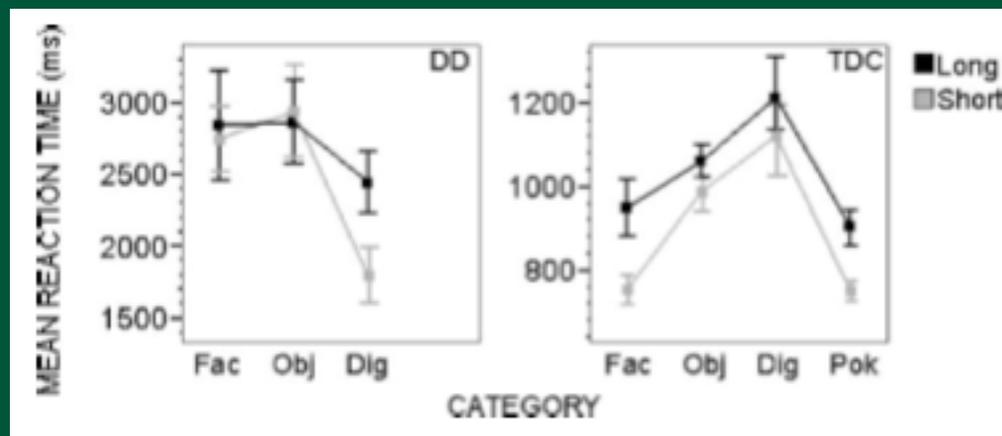
Methods

- **Neuroimaging task:**
- **Subjects were shown pairs of images of familiar and unfamiliar faces, objects, and masked and unmasked Digimon and asked to determine if they were the same or not while an fMRI was performed**



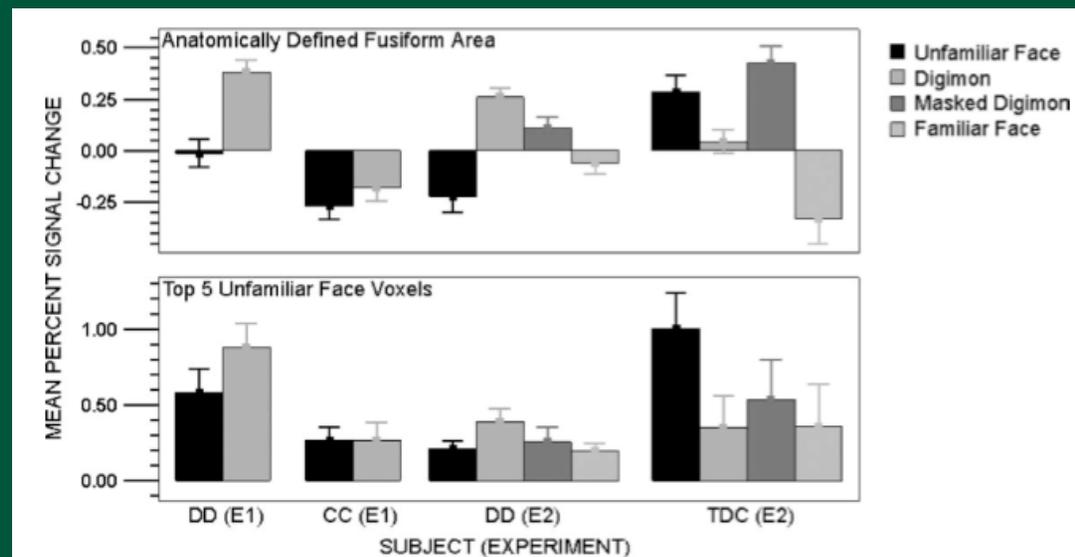
Results

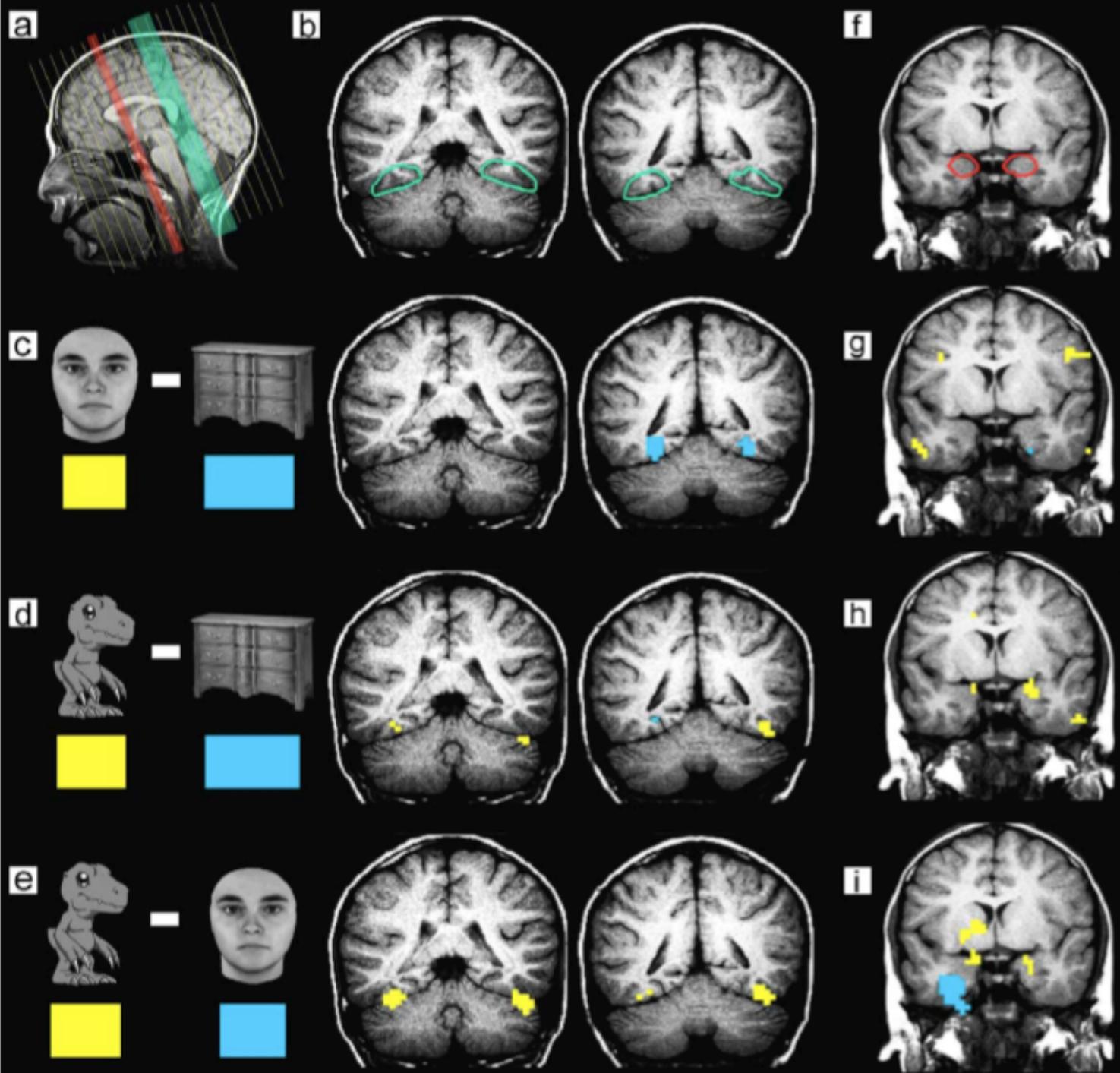
- Forced choice verification task:
- DD recognized Digimon faster than faces or objects, which he recognized at about the same speed
- TDC recognized faces and Pokemon the fastest, then objects, then Digimon
- TDC's reaction time to all stimuli was significantly faster than DD's



Results

- Neuroimaging task:
- DD's amygdala and lateral FG activated for discriminations involving masked and unmasked Digimon but not familiar and unfamiliar faces
- Both patients with autism showed a greater response to objects than unfamiliar faces





Discussion

- **DD could have a dysfunctional face module but otherwise normal FG**
- **Hypoactivation of the FG by faces could be due to lack of social motivation in people with autism**
- **Since same photos of familiar faces were used throughout the experiment the FG response was most likely weakened**

Opinion

- **The Digimon have faces – could possibly test a subject with an interest in objects without faces**
- **Briefly touches on whether hypoactivation of FG is from nature or nurture of the disorder but does not expand upon this**
- **Possible follow-up study if interest in Digimon fades**

Questions?