Searching for quantitative biomarkers of ASD using computational approaches and rapid assessment fMRI

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quantifying social exchange with the 10-round ‘trust’ game...

$20 \rightarrow \text{“Investor”} \quad \text{pay (x3)} \quad \text{“Trustee”} \quad \text{repay}

Adapted from Tomlin, et al., *Science* 2006
Chiu, et al., *Neuron* 2008
diminished self-responses in ASD

Investor decision revealed

10s

Trustee sends decision

8s

“other”

“self”

age & IQ matched controls (n = 18)

ASD adolescents (n = 12)

ASD symptom severity (fraction of maximum)

max

min

Chiu, et al., Neuron 2008
behavior in the trust game…
inequity goes towards ASD trustee’s partner
objective:

develop rapid fMRI based assays for classifying ASD neural subtypes in children
Peak BOLD signal change in the MCC to a single presentation of a “self image”

- 35 adults
- 30 typically developing children
- 27 children diagnosed with ASD
Single-shot, vmPFC, “favorite face”
future directions…

• rapid assessment using images, (pictures, movies)
  – (passive visual responses)

• assessment using auditory stimuli
  – (passive auditory stimuli, i.e., classical music)

• social exchange game
  – increase sample size
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