

# Harnessing Affinities to Inform our Understanding of Autism

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Autism and Neurodevelopmental Disorders Institute*

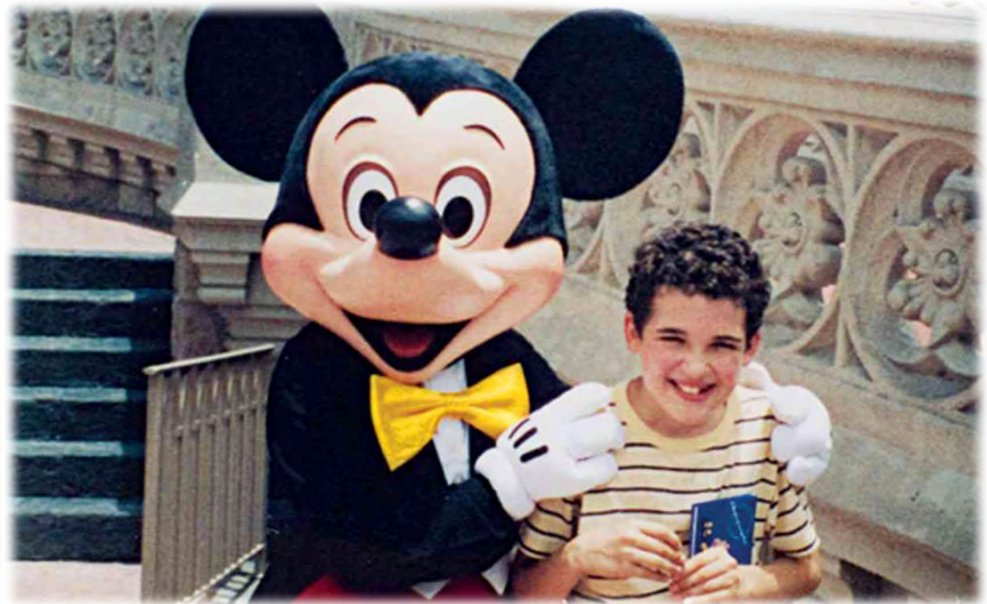
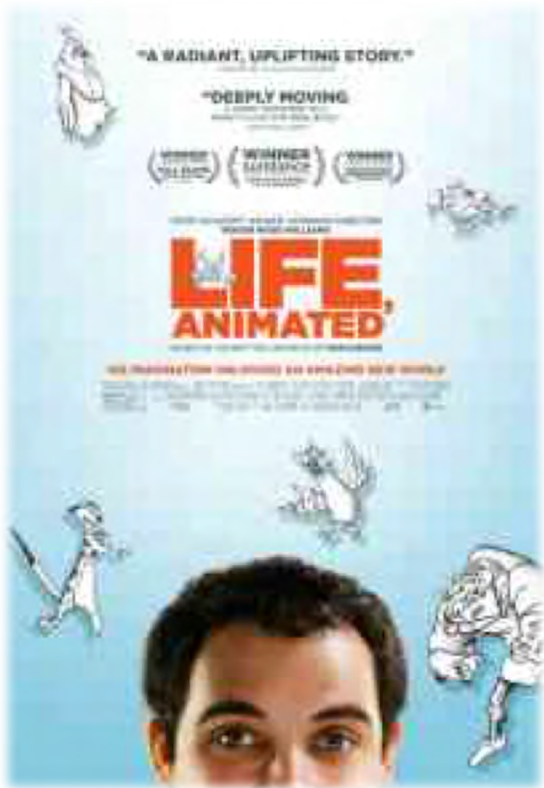
October 15, 2016



**AUTISM & NEURODEVELOPMENTAL  
DISORDERS INSTITUTE**



**Children's  
National™**





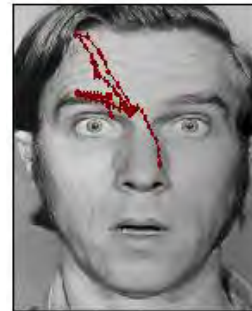
# Thoughts on Affinities

- There is not an “Affinity Therapy” *per se*.
- Shared interests are powerful social motivators
- Affinities *can be* more of a pathway than a prison
- Movies, Anime, Maps, Minecraft, Shining Time Station, Disney, Animation
- Positive context with another person – oxytocin
- Engagement in a child’s affinities can put a focus on ability
- By respecting someone’s affinity, you are respecting them. All have a right to respect, dignity and pursuit of happiness
- Harnesses role play and technology
- If valuable, what might be the mechanism?

# Attention to people



Autism



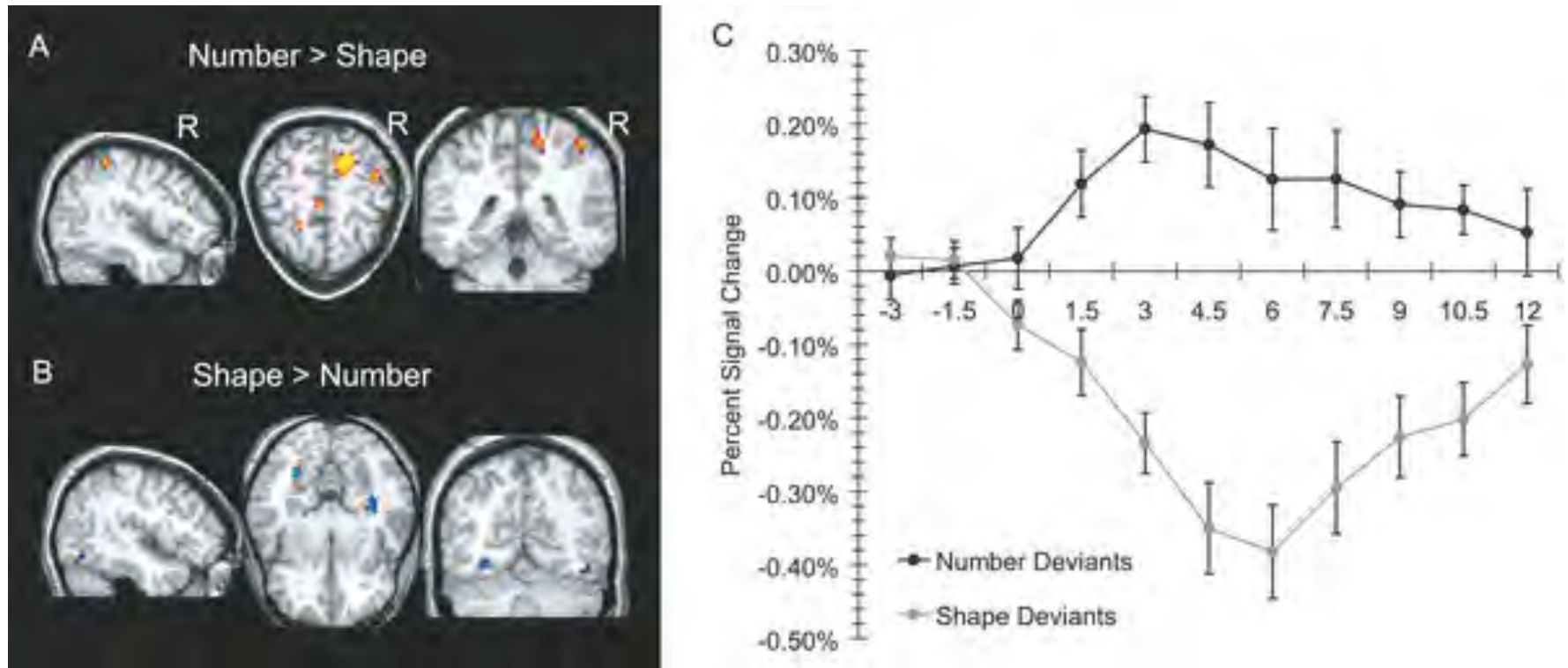
Typical



Pelphrey et al., 2002, *JADD*



Figure 3. Child Participant's fMRI Results



Cantlon JF, Brannon EM, Carter EJ, Pelphey KA (2006) Functional Imaging of Numerical Processing in Adults and 4-y-Old Children. PLoS Biol 4(5): e125. doi:10.1371/journal.pbio.0040125  
<http://journals.plos.org/plosbiology/article?id=info:doi/10.1371/journal.pbio.0040125>

## Faces & Objects

## Letters & Numbers

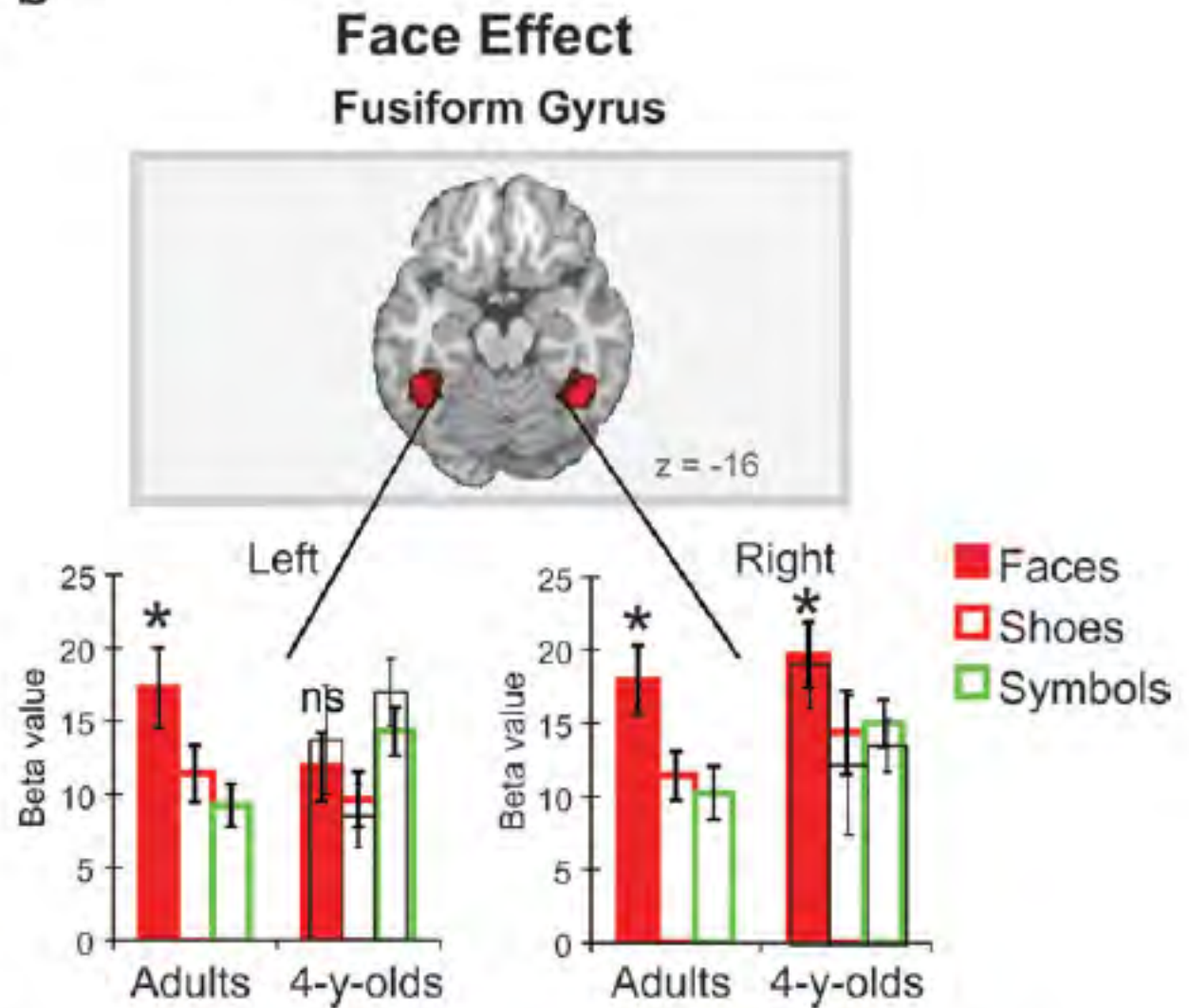




a



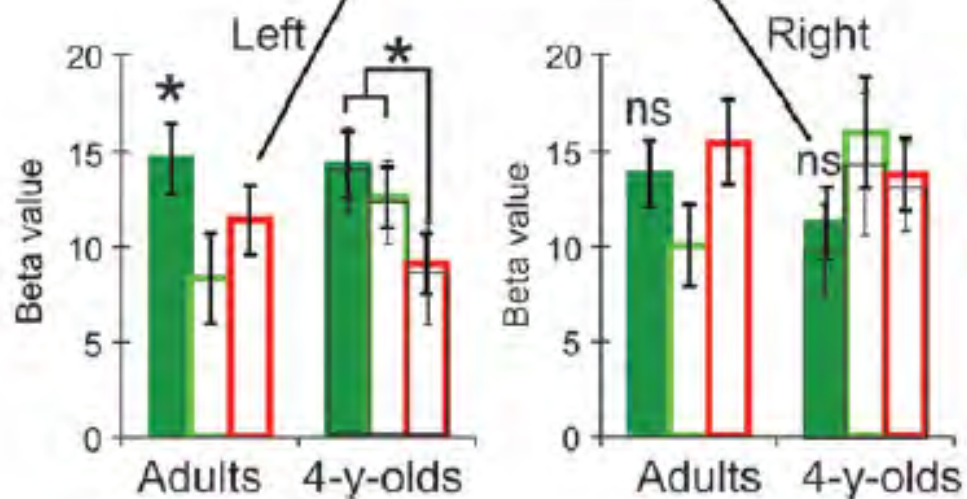
b



a

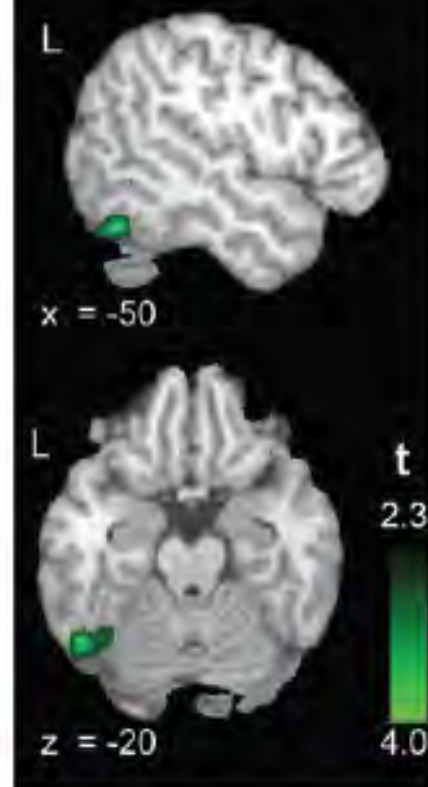
## Letter Effect

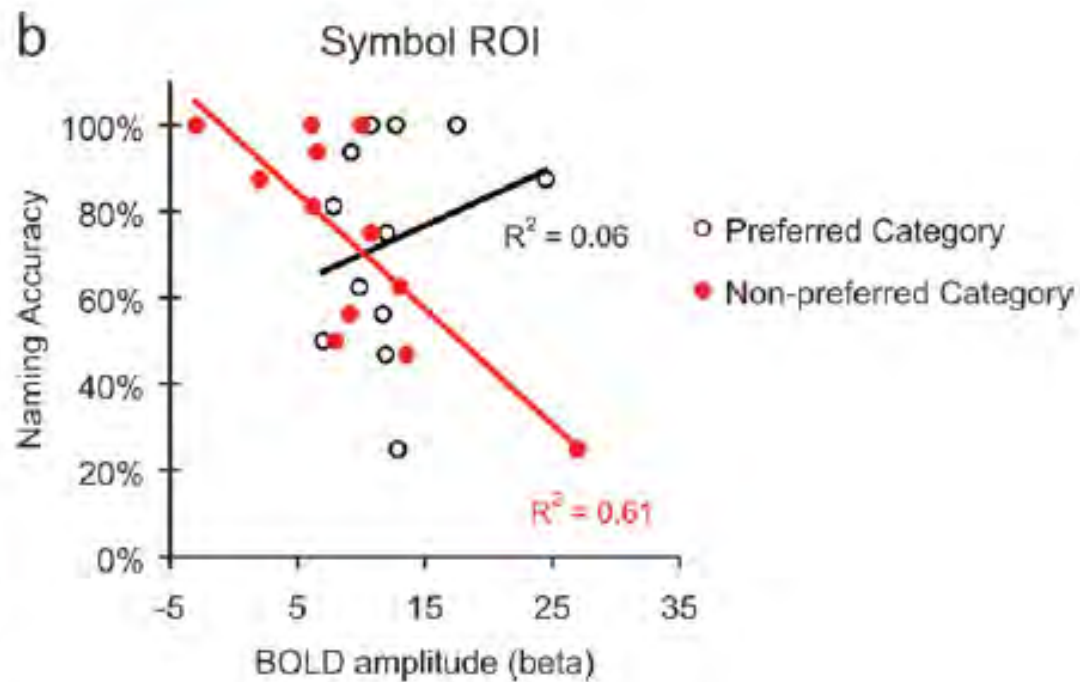
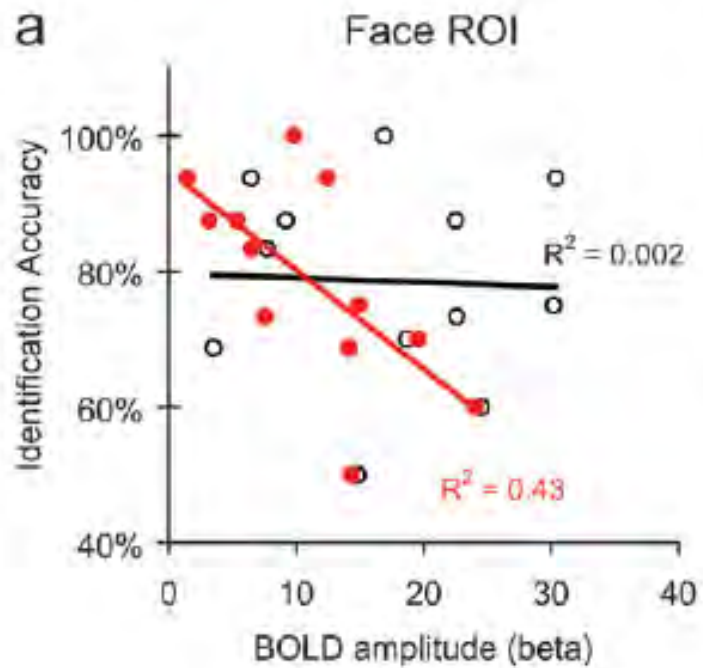
Inferior Temporal/Fusiform

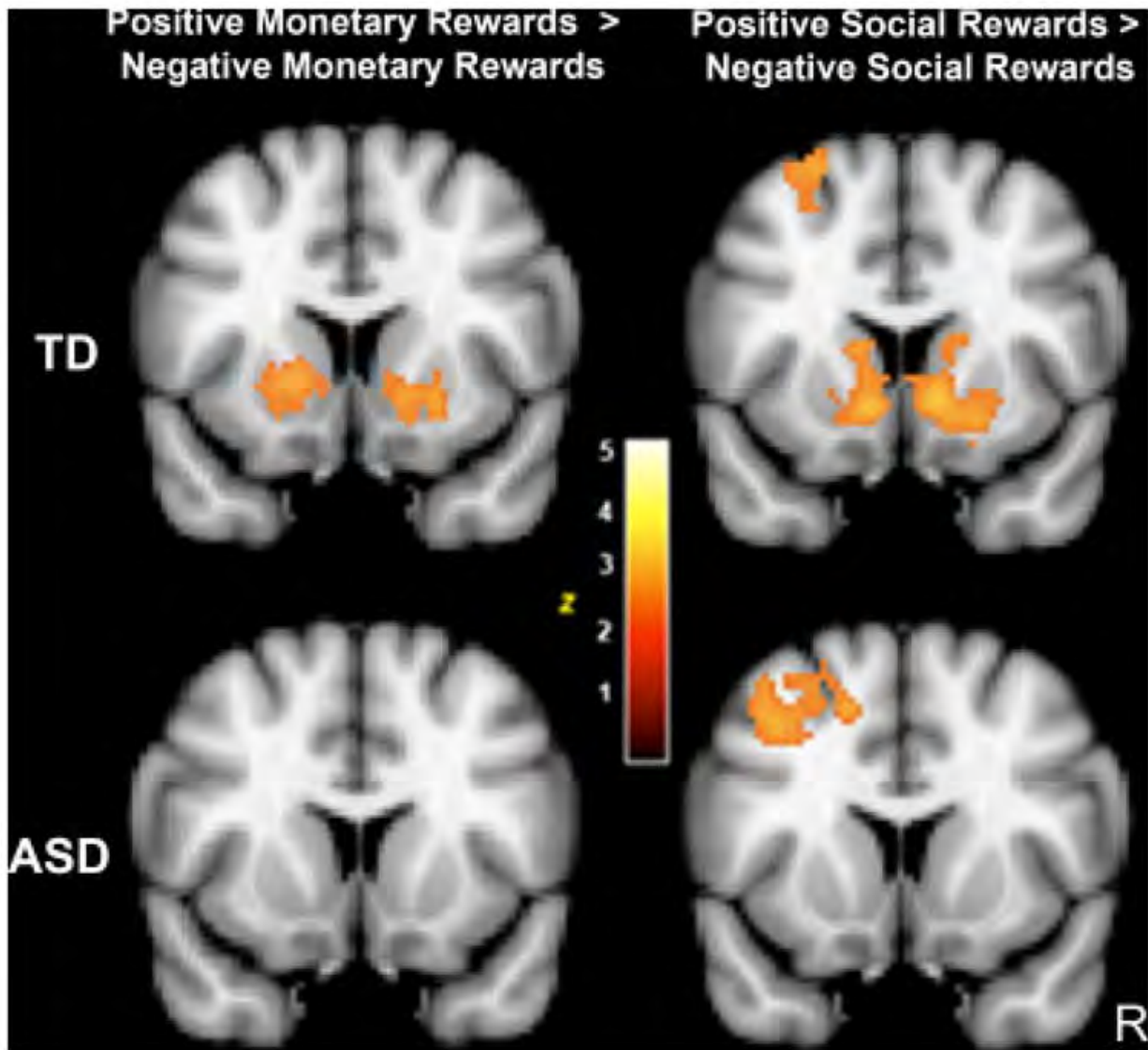


b

ANOVA  
Kids > Adults X  
Symbol > All





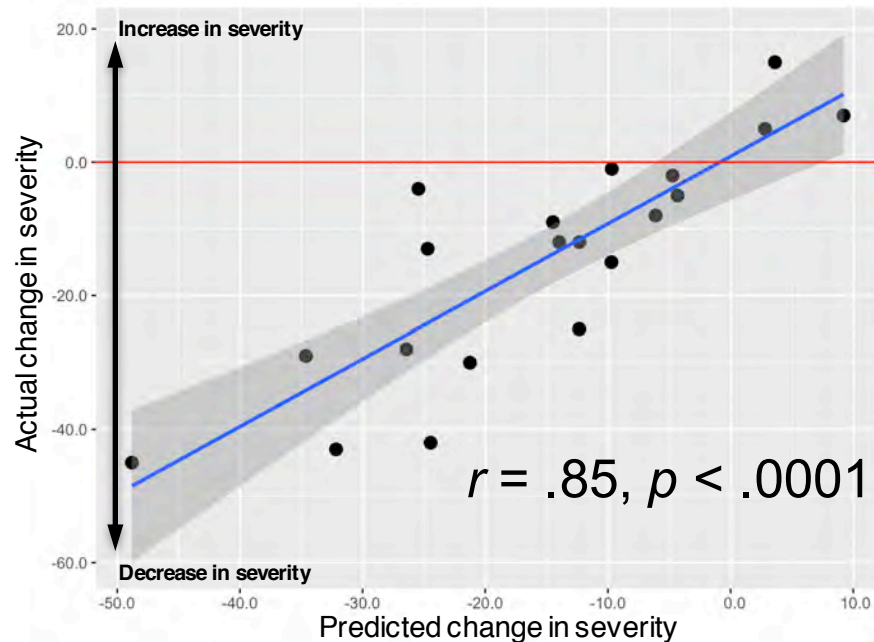
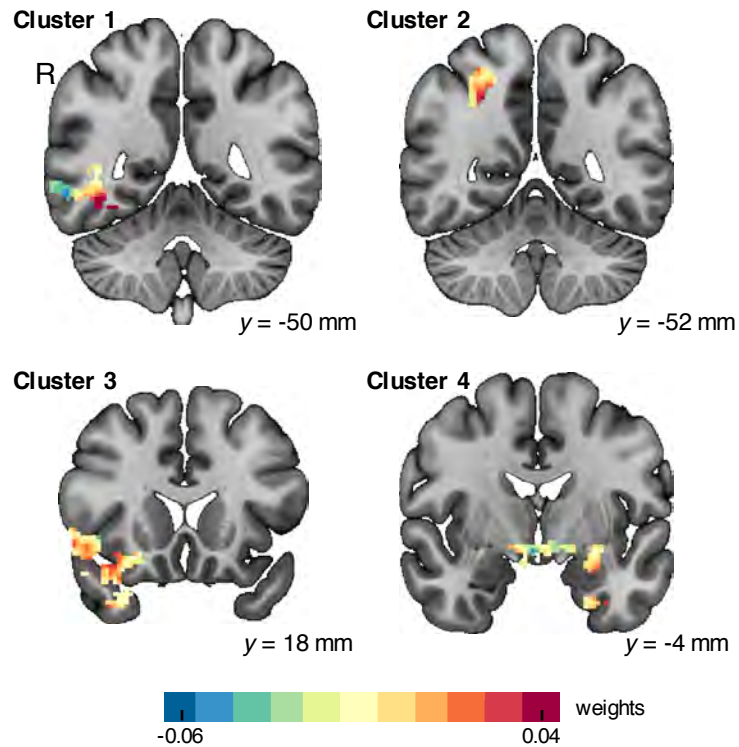


Scott-Van Zeeland, Dapretto, Ghahremani,  
Poldrack, & Bookheimer, 2010, *Autism Research*

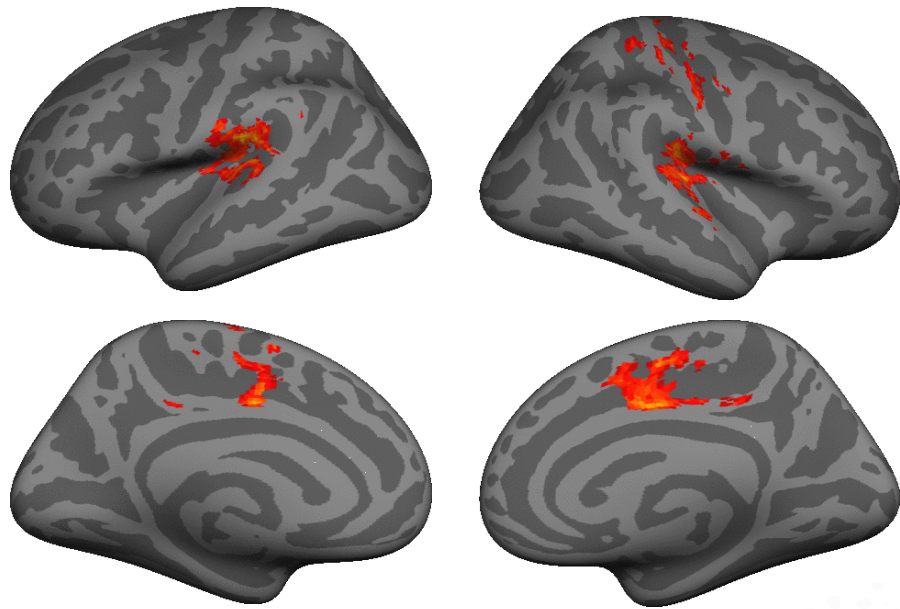
# Pivotal Response Training (PRT)



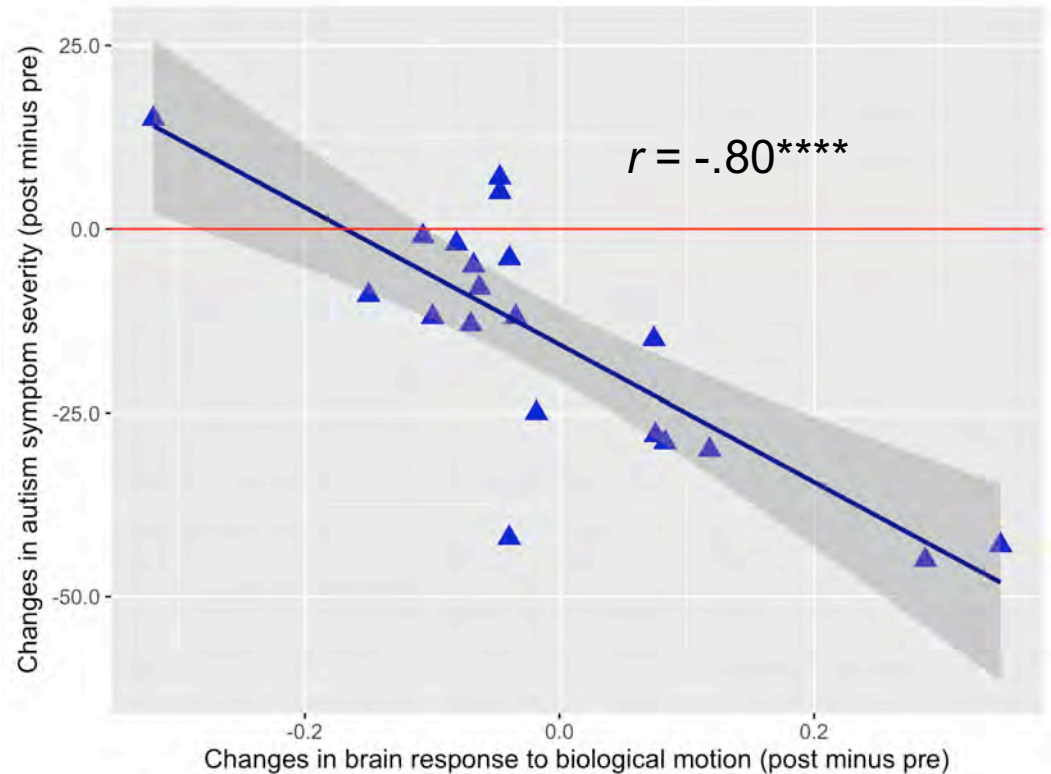
# Neuro-prediction of treatment response



Yang et al. (in press)  
*Nature: Translational Psychiatry*



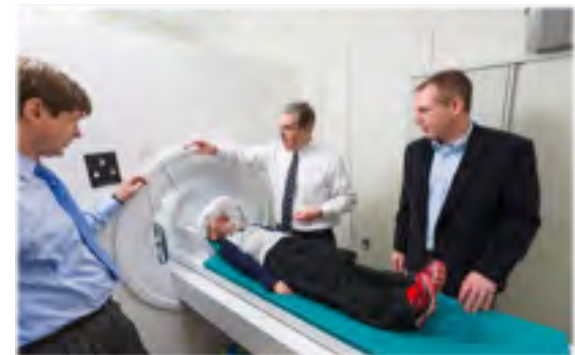
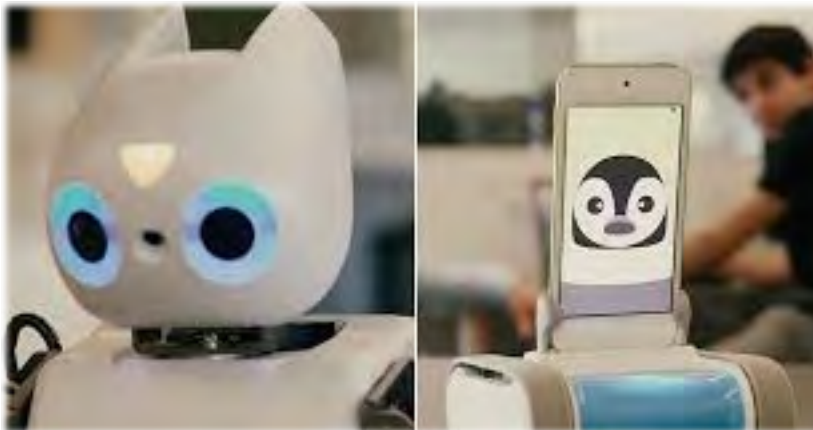
Change in brain,  
driving change in  
behavior



Yang et al. (in press)  
*Nature: Translational Psychiatry*

# Using Robots to Prime Neuropredictive Brain Circuits in Children

<https://cmssite9.gwu.edu>





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# The Exceptional Minds Program



# Stem 3 Academy – The Help Program

**STEM<sup>3</sup> GRADES K-12  
ACADEMY**

a school of  
The Help  
Group

## ROLLING ADMISSIONS

For bright, curious, technology-driven  
students grades K-12 who have social  
and/or learning differences



[www.STEM3Academy.org](http://www.STEM3Academy.org)

- Half of autistic adults have average or above-average intellectual ability, yet their unemployment rate is extraordinarily high—up to 80%
- Most efforts focus on treating relative weaknesses in people with autism.
- > 60% of cognitively able individuals with autism have relative cognitive strengths including being detail oriented and having excellent mnemonic skill.
- Corporations are beginning efforts to engage such individuals in their workforce.
  - Microsoft
  - SAP
  - Freddie Mac
- Cybersecurity and Autism (video)
  - <https://www.youtube.com/watch?v=oJhzM4ttW-E&feature=youtu.be>

# Acknowledgments

The Carbonell Family

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NICHD

NINDS

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Autism Speaks

Hilibrand Foundation

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