

Neural Mechanisms Underlying Empathy

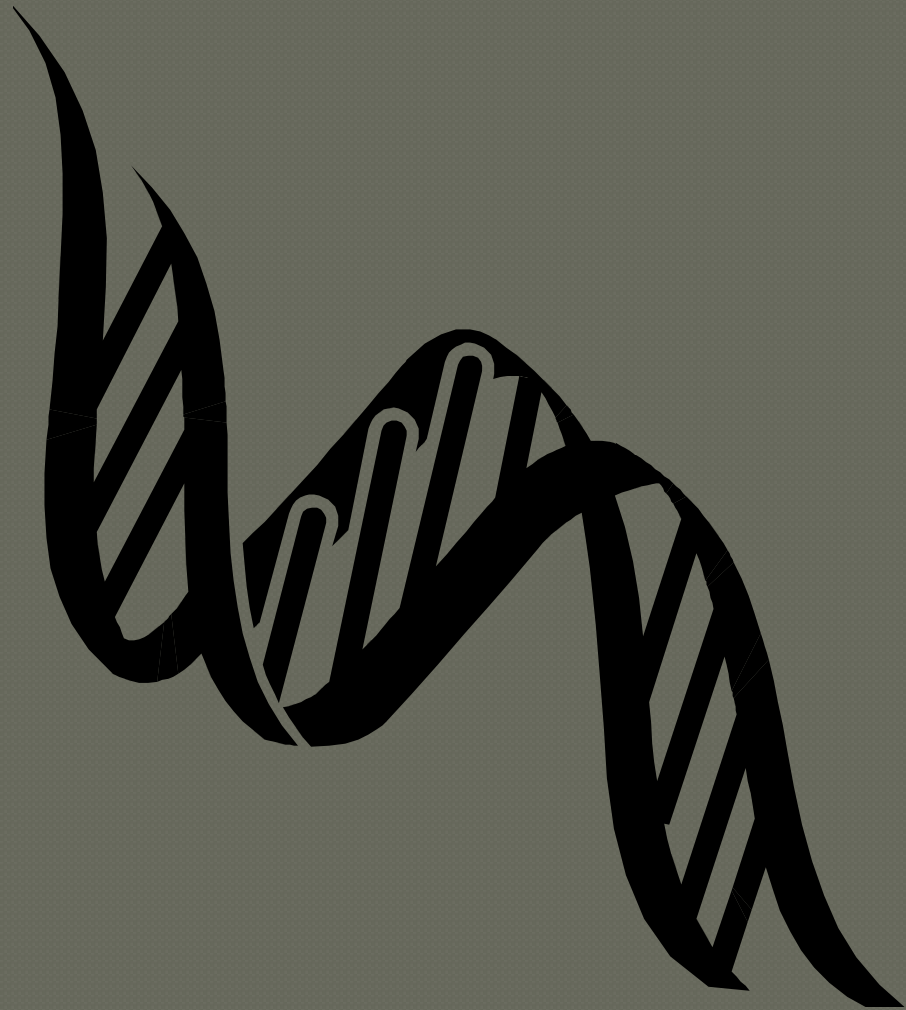
Study of Adolescents with ASD
and their Fathers

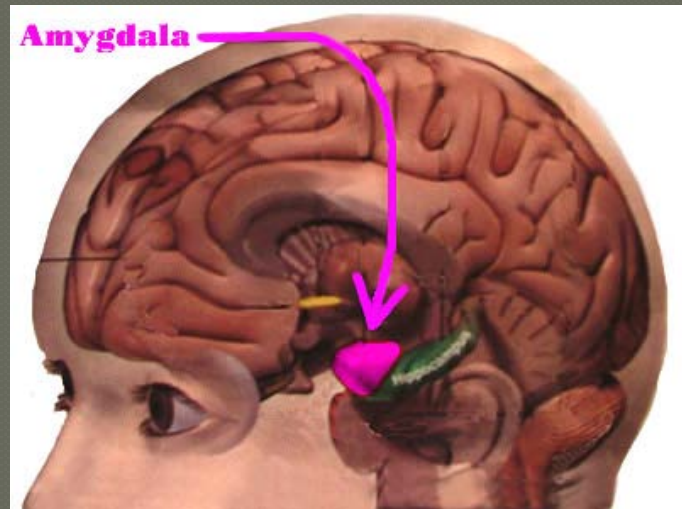
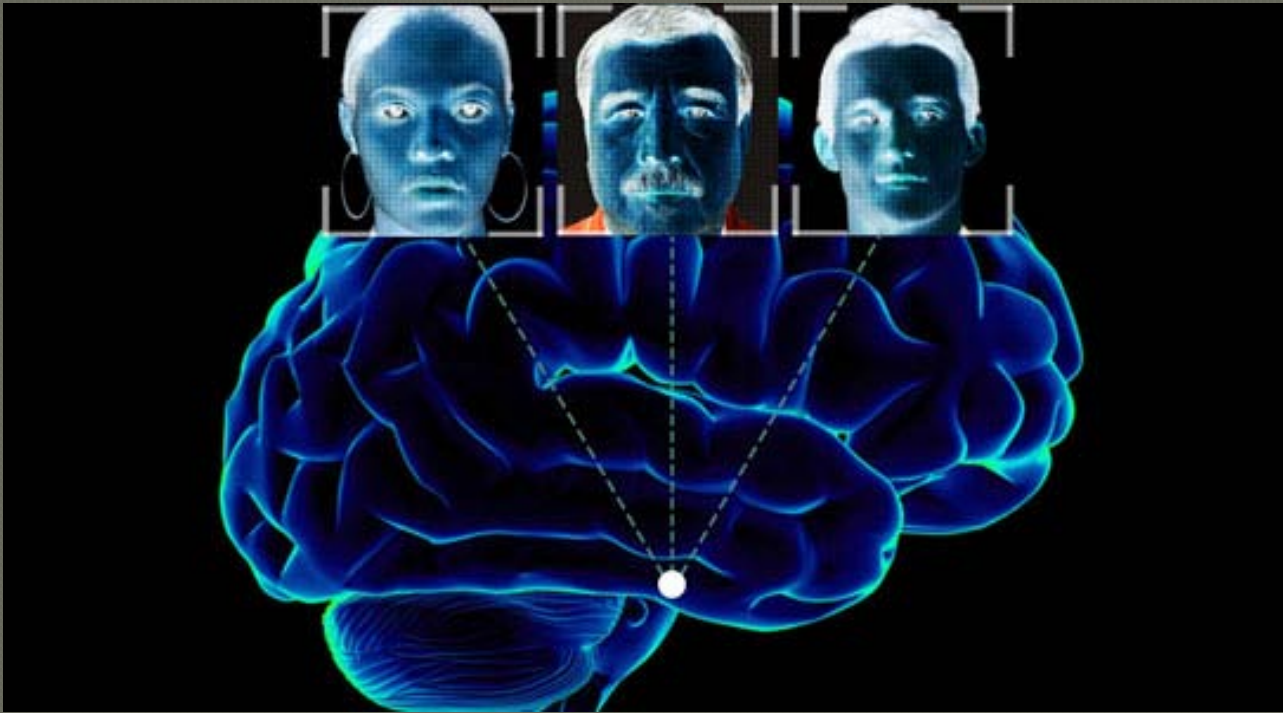
Amanda Seelman

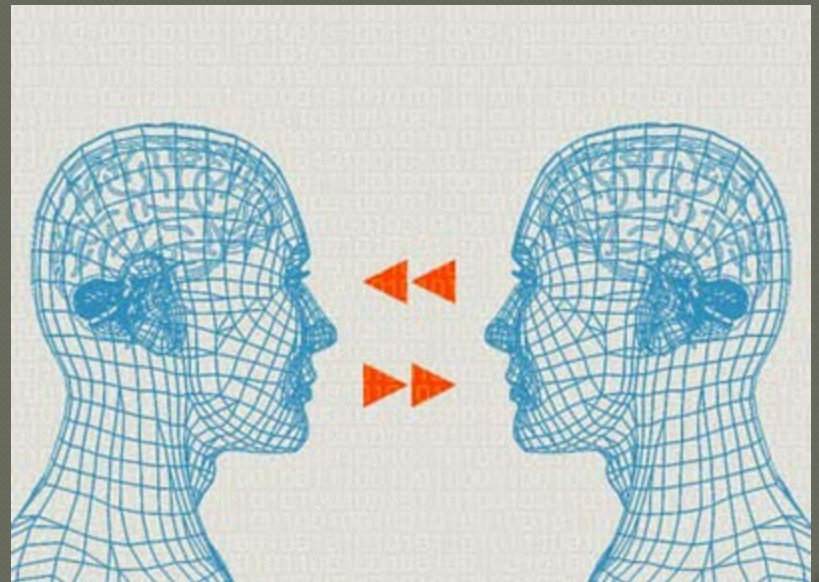
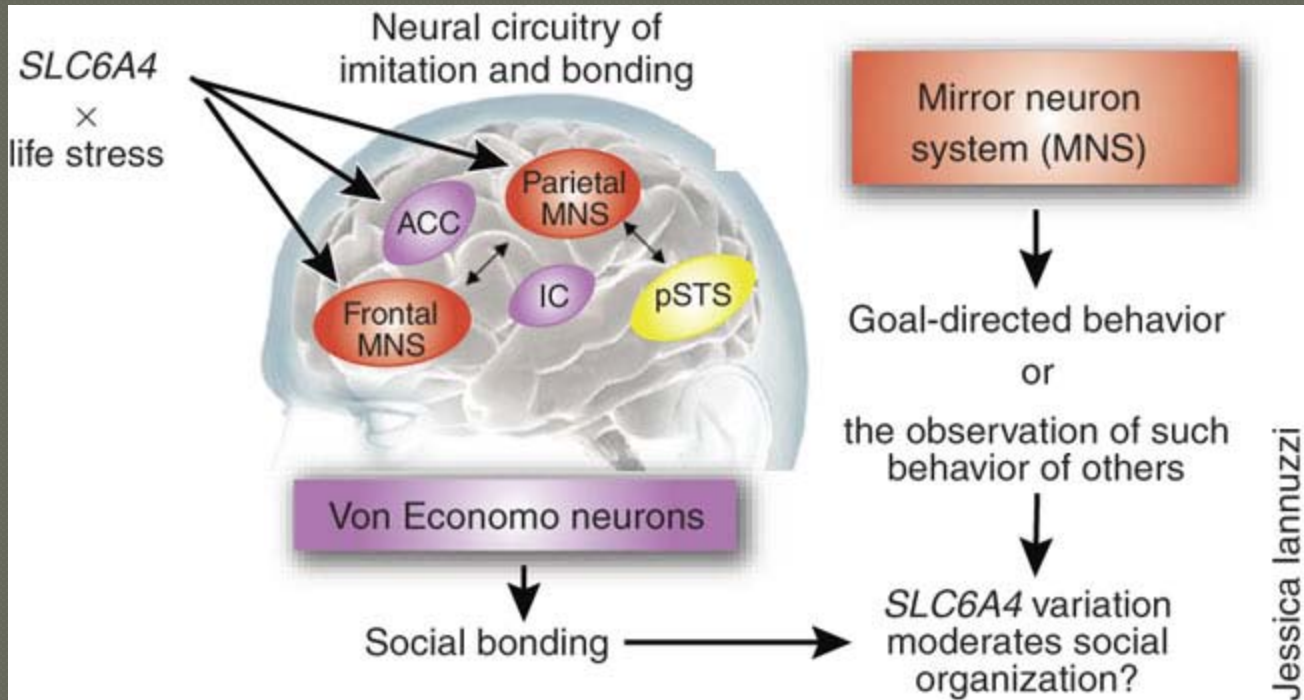
Background



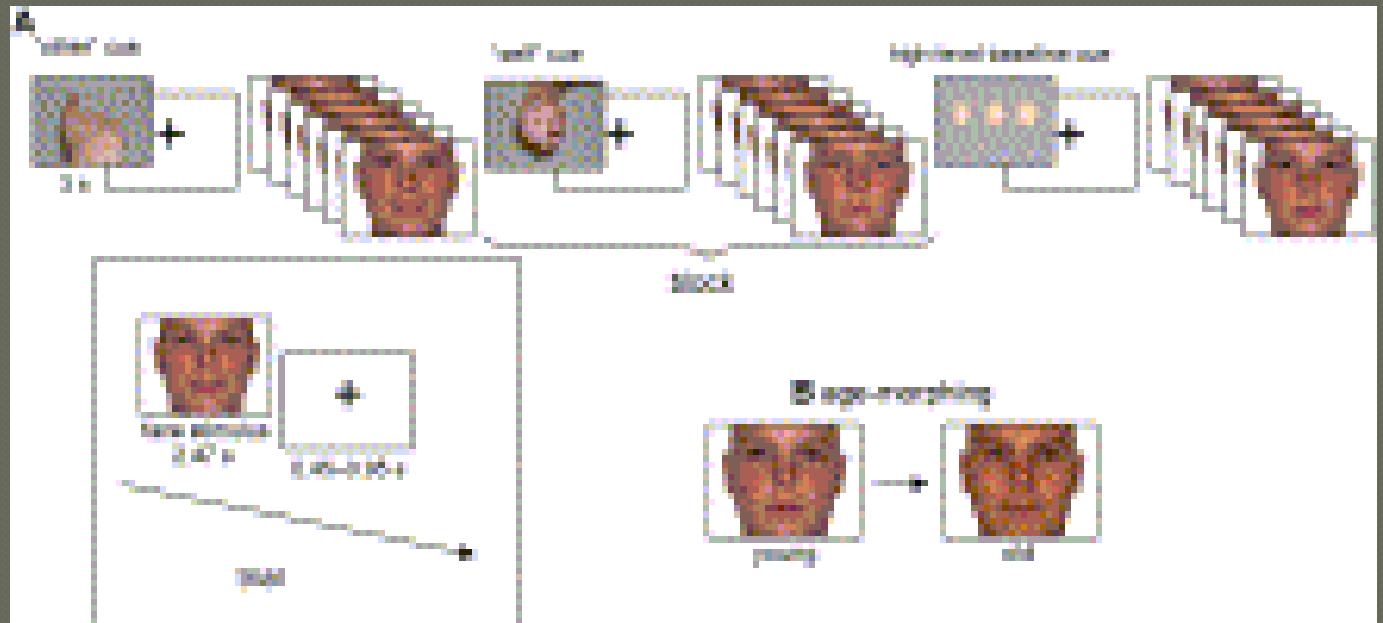
Autism Spectrum Disorder
is ~90% heritable.







GEM = Griffith Empathy Measure
BEES = Balanced Emotional Empathy Scale



Results

Other Task: ASD adolescents \ll Controls for *weak* stimuli

Self Task: ASD adolescents $<$ Controls for *weak* stimuli

Both groups of fathers showed no differences in correct/congruent responses for either task.

Notably: Fathers of ASD adolescents exhibited faster reaction time during presentation of strong stimuli in the self task.

fMRI Results

-Stronger activation in Fusiform Gyrus for controls compared to ASD adolescents and their fathers.

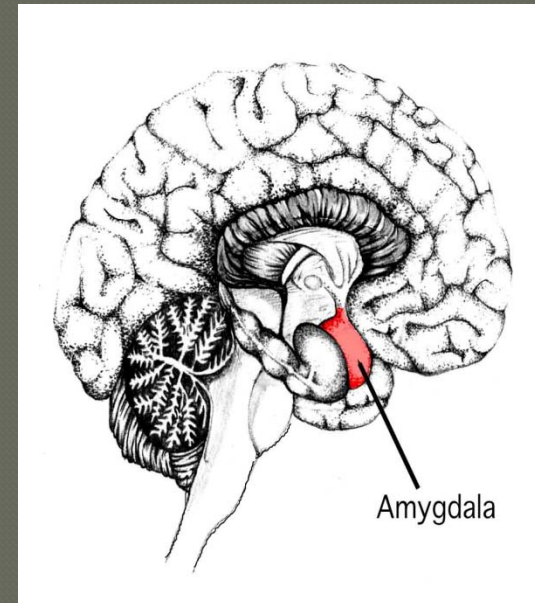
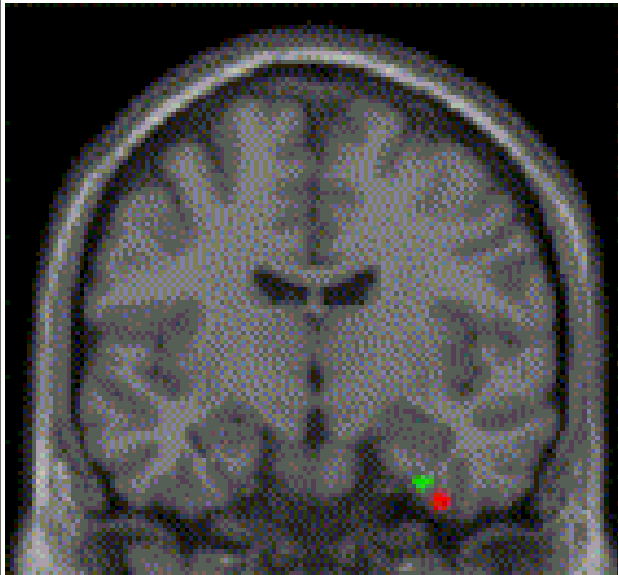
ASD fathers showed decreased amygdala volume compared to controls.

-In healthy adolescents, there was a positive association between GEM scores and insula activity.

other vs. high-level baseline

control group > ASD group;

control fathers > fathers of ASD subjects



Inferences

Strong genetic component

Fathers showed reduced FG activation in other task

Empathy abilities correlate with FG activation

Amygdala plays a role, but is age-dependent

Strategies must be present to compensate for FG and amygdala dysfunction

The hMNS and insula also play a major role in empathy

Initial deficits in face perception may actually lead to cascading social problems and dysfunctions of related brain areas.

