

Feeling with others

To navigate in a social environment, learn from each others,
collaborate & avoid harming others
we need to understand the actions, sensation and emotions of others



Valeria Gazzola &
Christian Keysers

I declare that I have
no conflict of interest



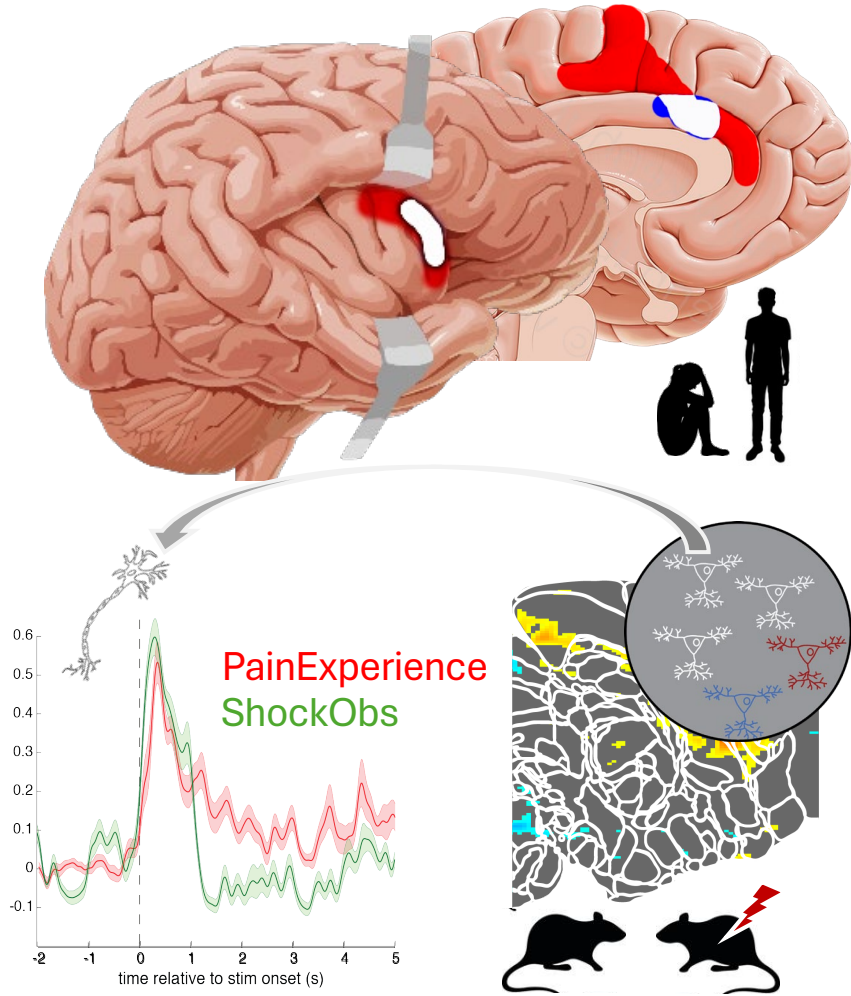
Social Brain Lab - Amsterdam

**Possibly more than just sharing
other's affects**



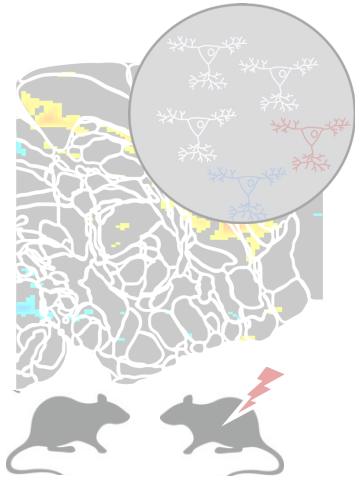
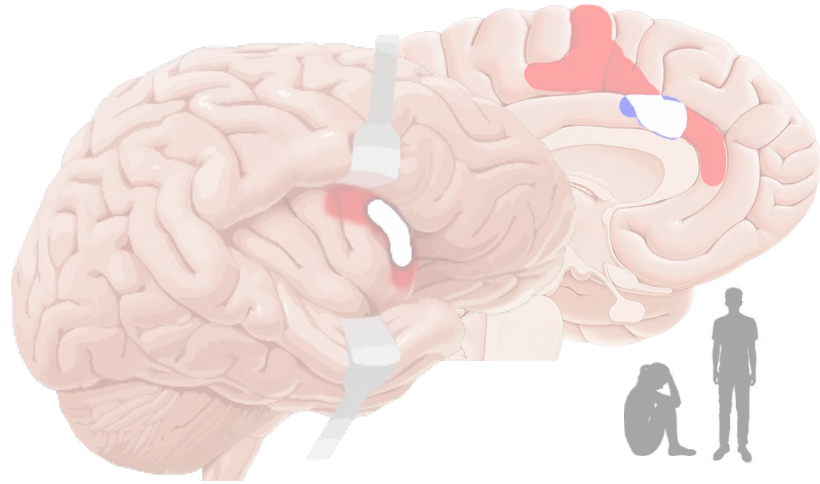
**We can also align with other's
actions & sensations**

Understanding other's
EMOTIONAL STATES
by recruiting emotion-related circuits
I use when I feel



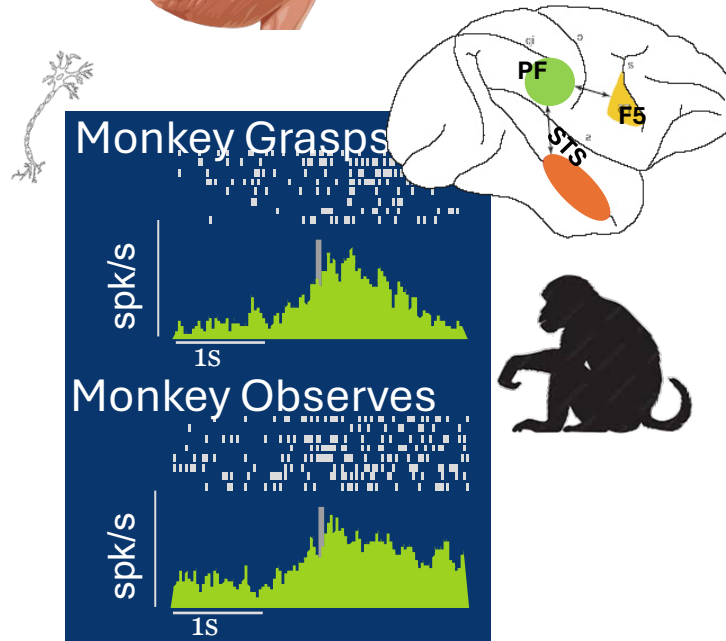
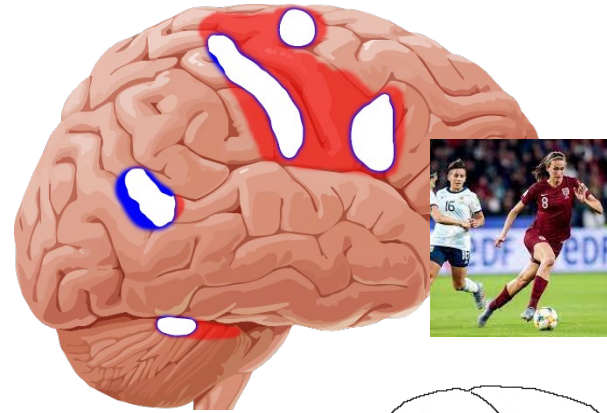
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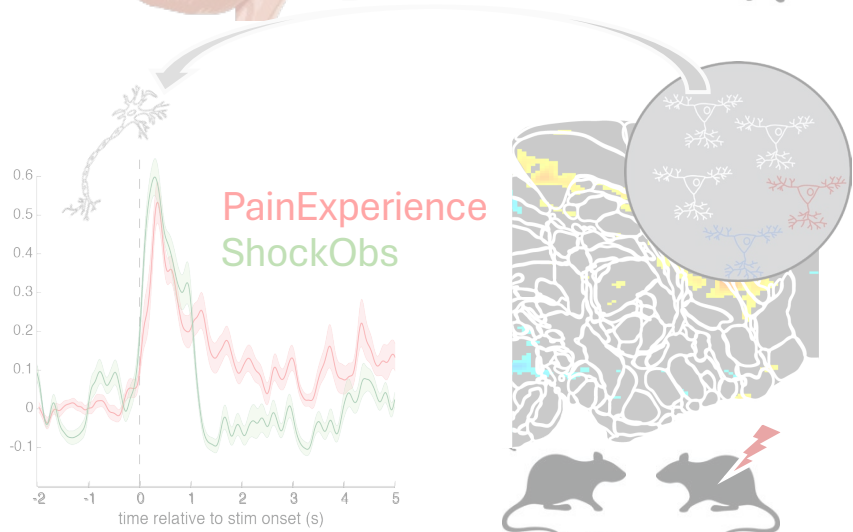
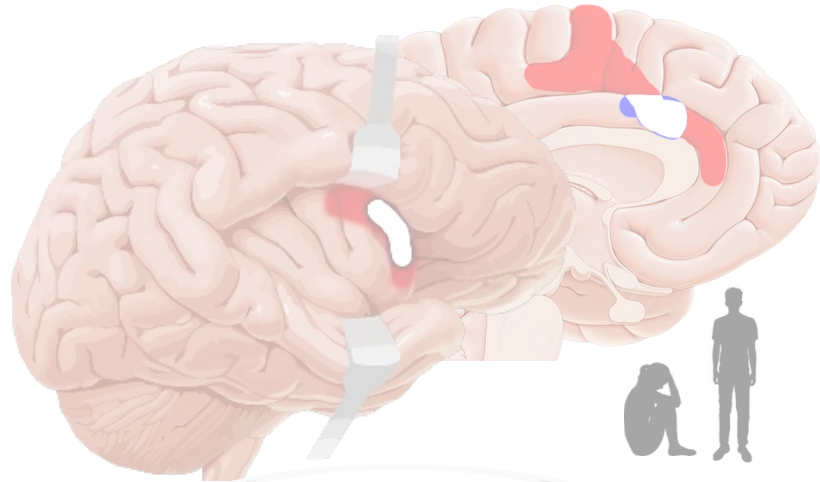
Understanding other's **ACTIONS**

by recruiting motor programs
I use when I act



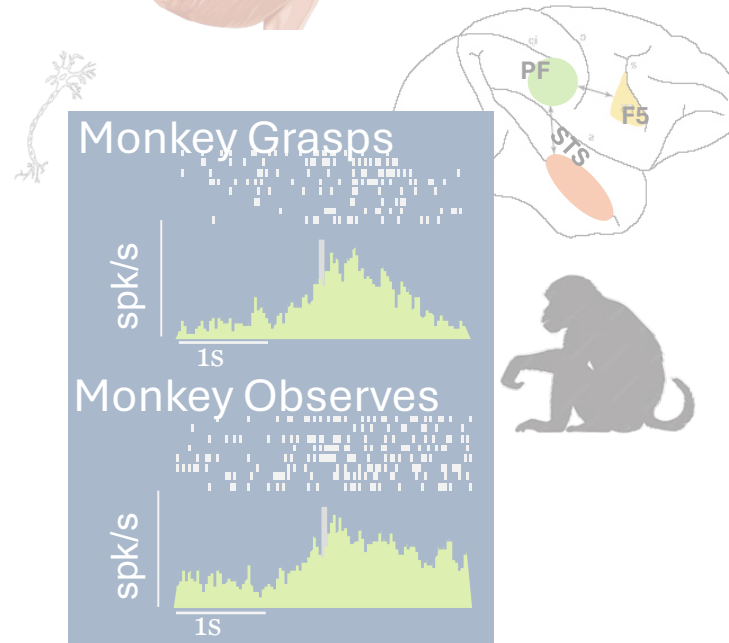
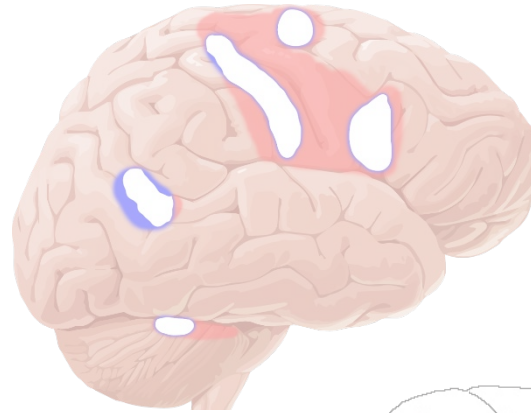
Understanding other's **EMOTIONAL STATES**

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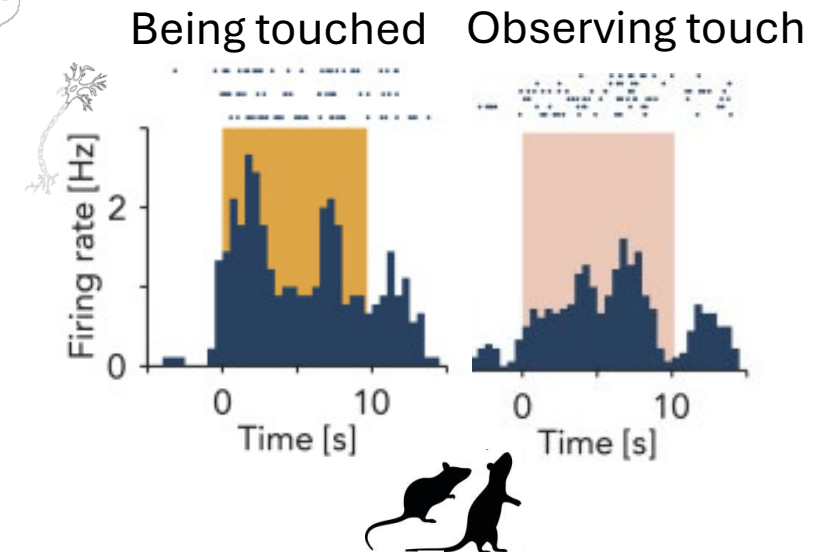
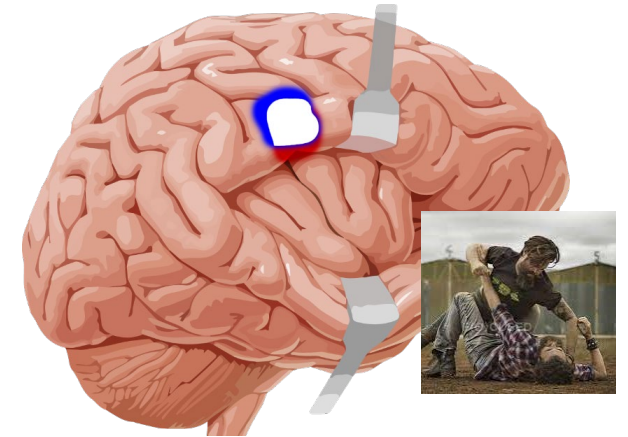
Understanding other's **ACTIONS**

by recruiting motor programs
I use when I act



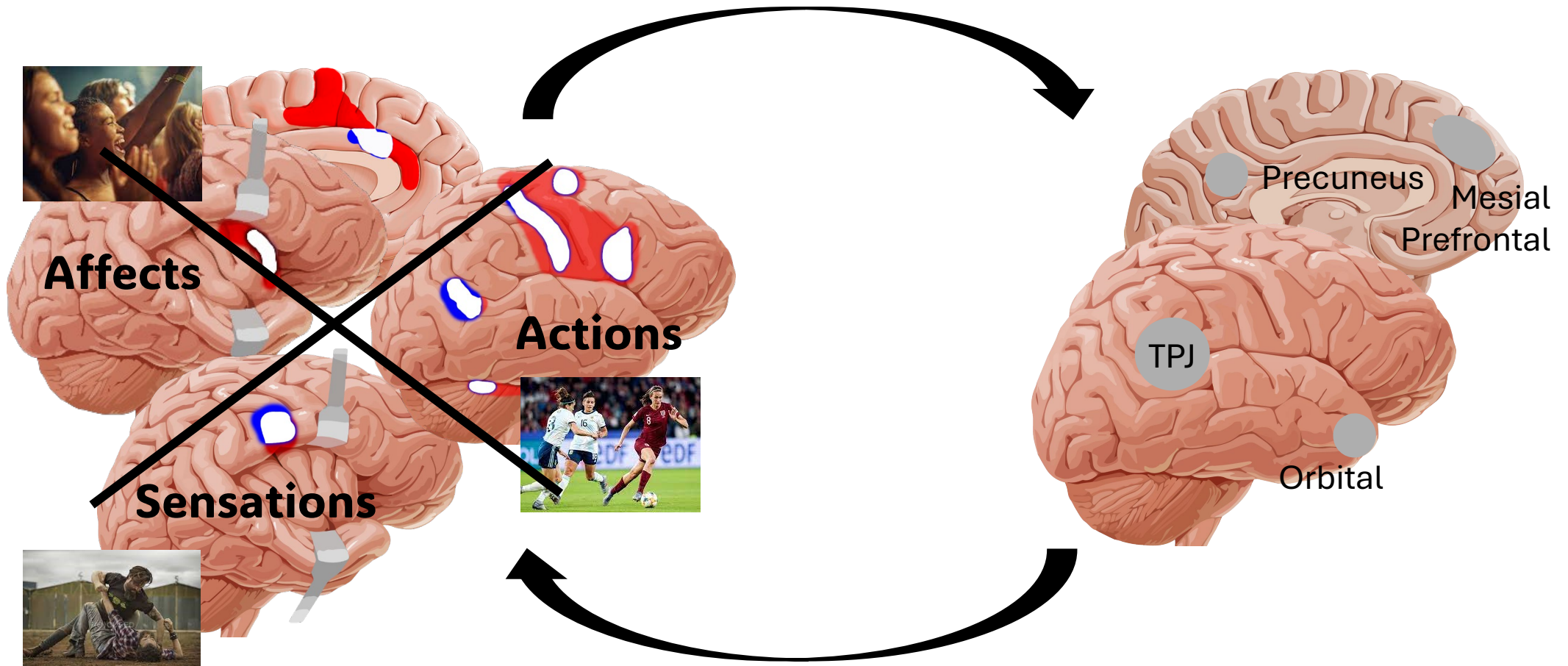
Understanding other's **SENSATIONS**

by recruiting sensory circuits
I use when I sense



Sharing

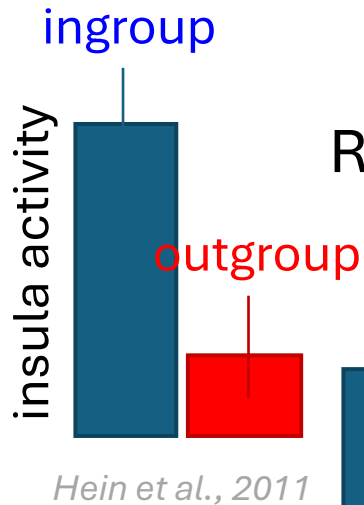
Thinking



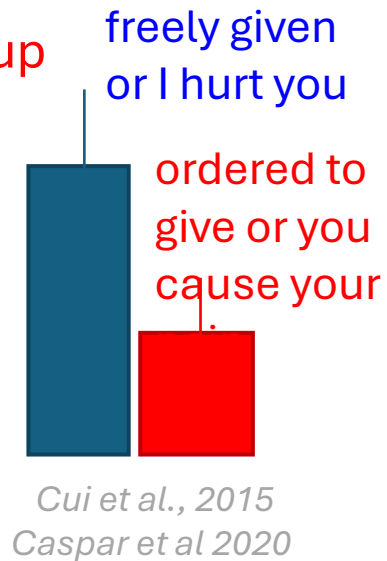
Spontaneous alignment with and perception of others

Modulating factors & Interindividual differences

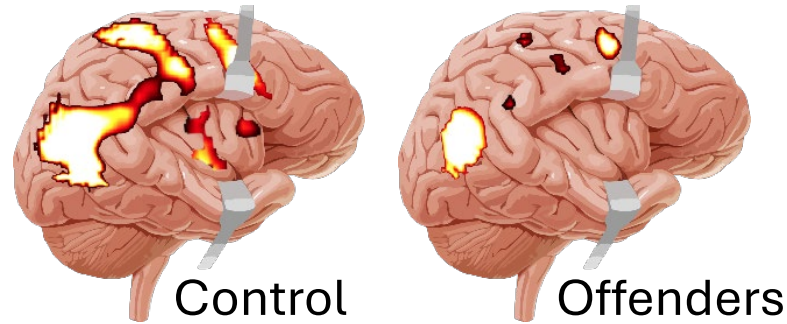
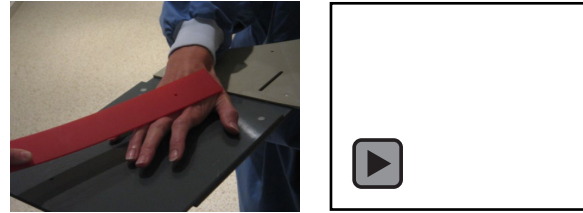
Familiarity



Responsibility



Individual with Psychopathy



Now empathize!



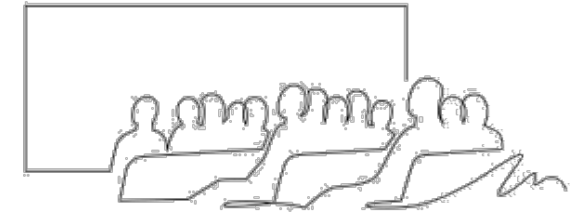
No differences between controls
and individual with psychopathy

Meffert et al., Brain, 2013

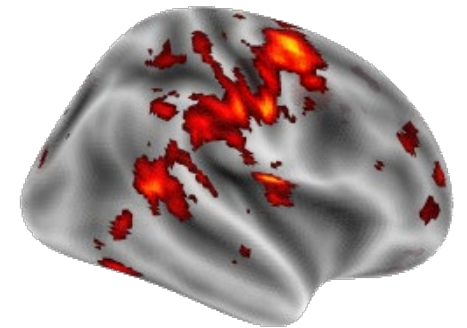
Keysers and Gazzola, TICS, 2014

Can we all **voluntarily**
regulate our responses?

YES



Watching movie while deciding to
empathize - deciding to detach
regulates brain responses and how
they synchronize across individuals



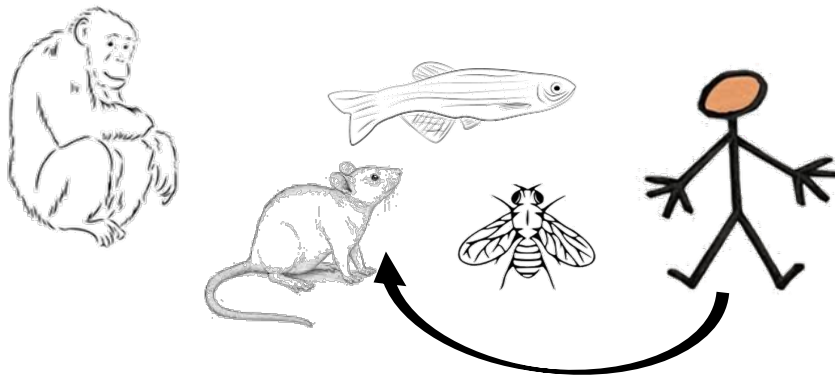
Borja Jimenez et al., Brain, 2013

What is the role of these overlaps?

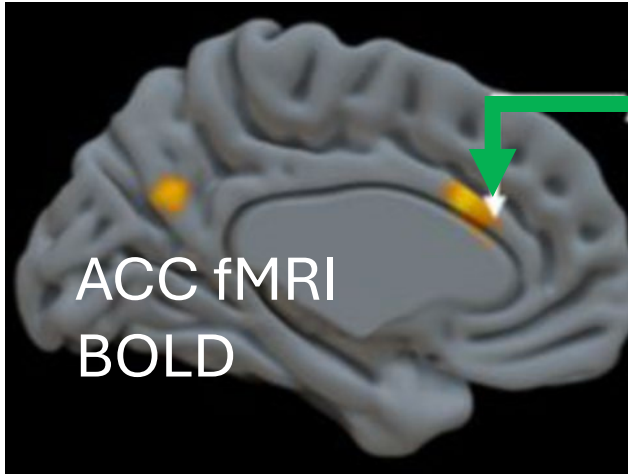
Avoid pain to others & help

OR/AND

Learning danger signals

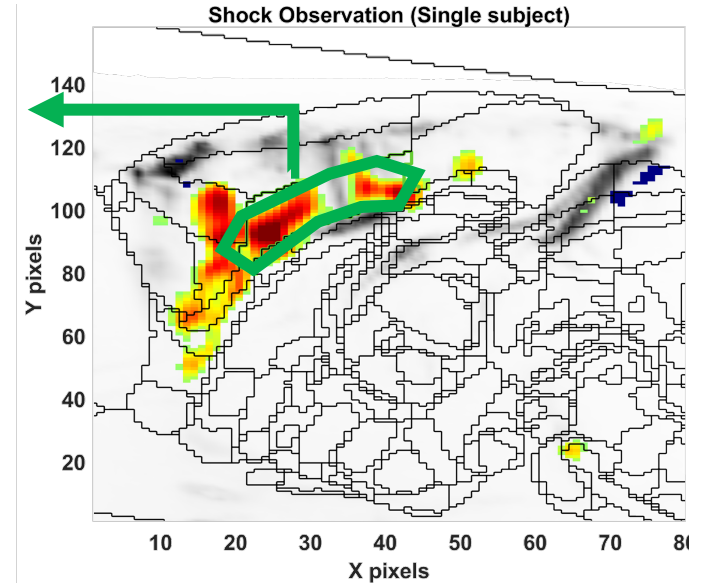


Motivation to help and avoid harm to others



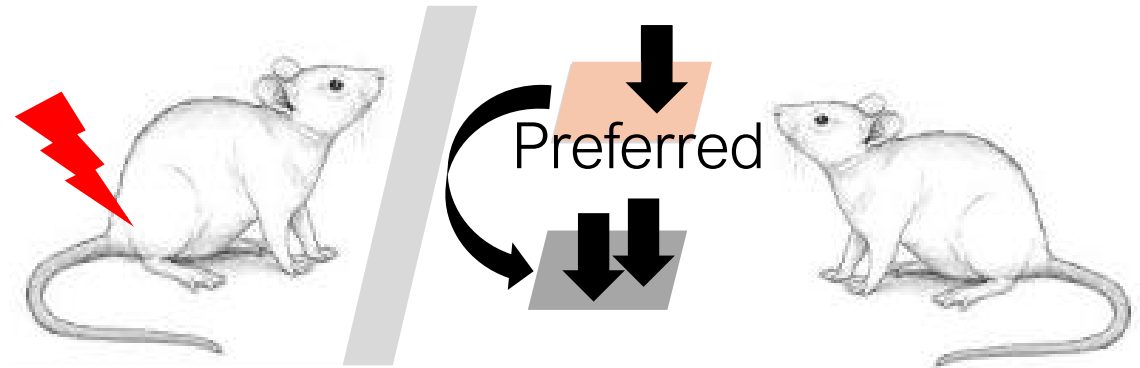
ACC correlates with how much money you donate to alleviate pain to the others

ACC necessary to prevent harm

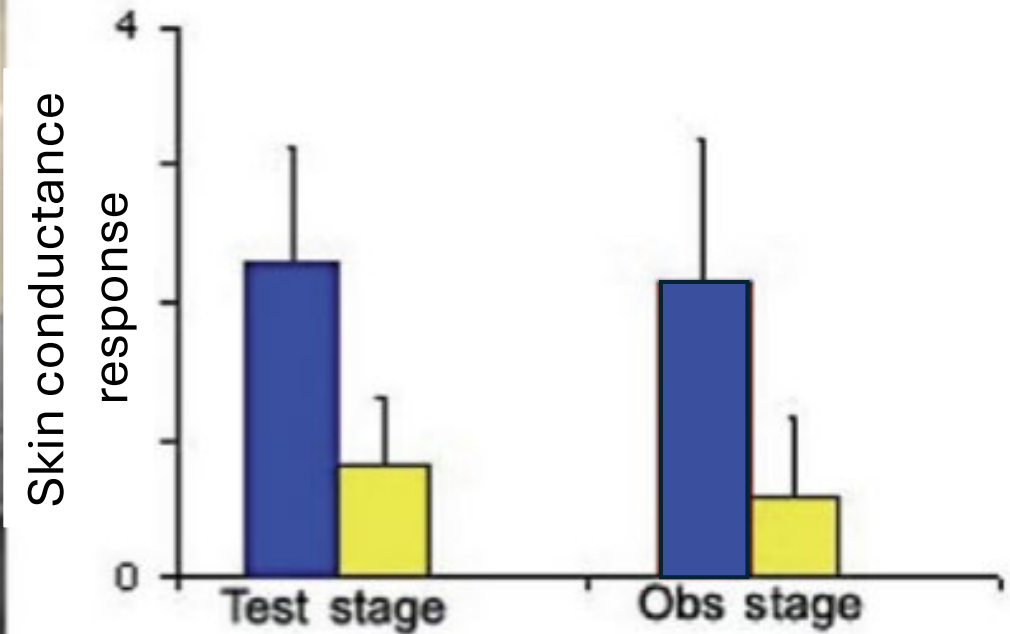
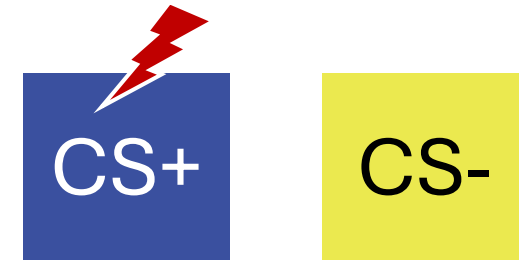


value updates

How much the pain you just caused alters the pain you'll predict the same action to cause in future

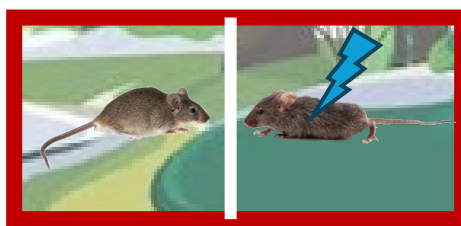
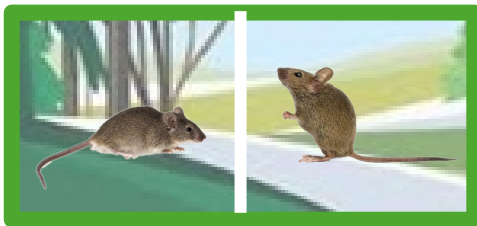


Vicarious fear learning in humans

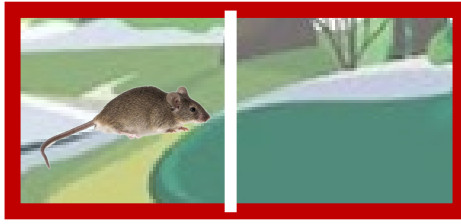


ACC, alns, amygdala, basal ganglia

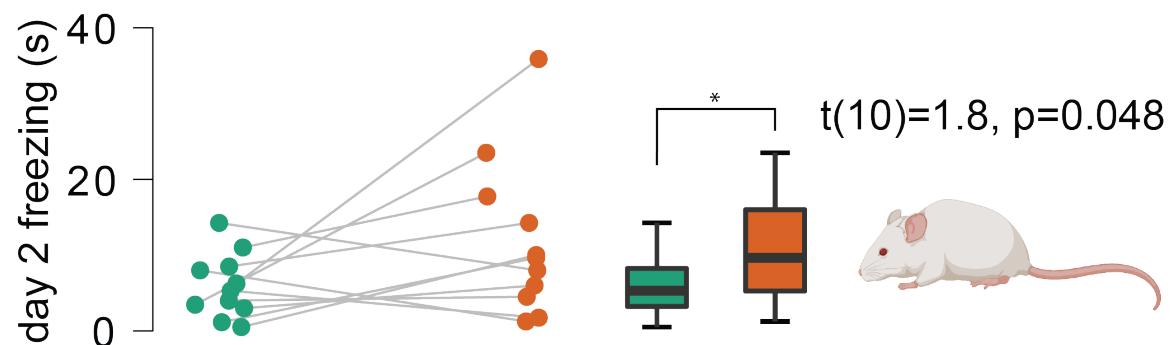
Day 1 learning



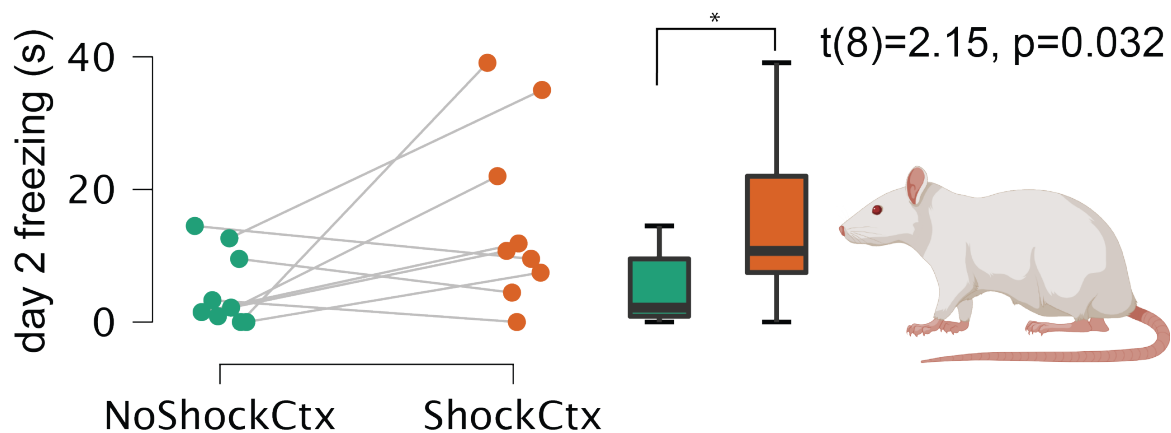
Day 2 test



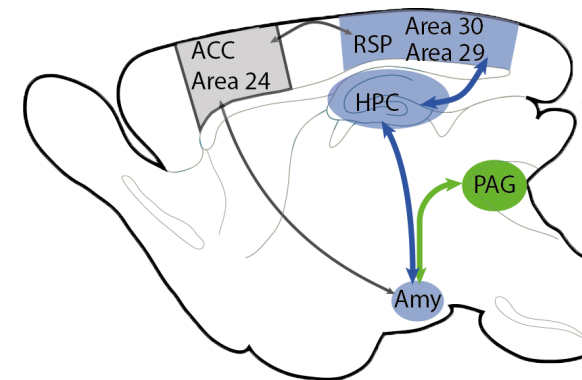
MICE



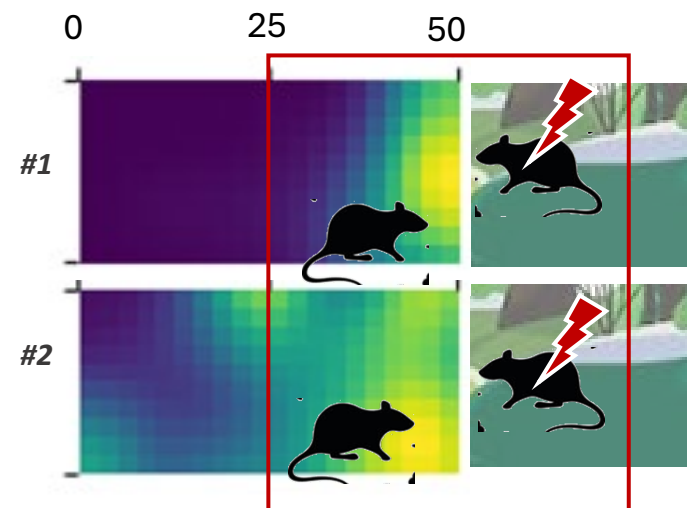
RATS



Vicarious fear learning



Place maps Pyramidal cells
– Shock Obs. Excited



**Shared representation can act both
As motivators
And
To learn from others**



Y.Onuki R.Paracampo L. De Angelis



N.Evans



M.Spezio



S.Speer



S.Gallo



A.Nostro



K.Ioumpa



L.Fornari



J. Campdepados



F. Michon



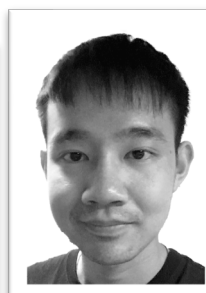
F. Nelissen



C. RojasCifuentes



P. Maldonado



C. Qin



D. Maresca



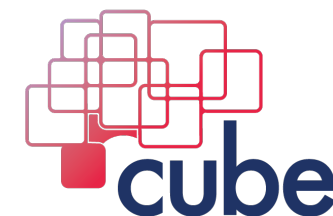
R. Waasdorp



B.Heiles



THANK YOU



R. Bruls



Y. Han



J. Hernandez



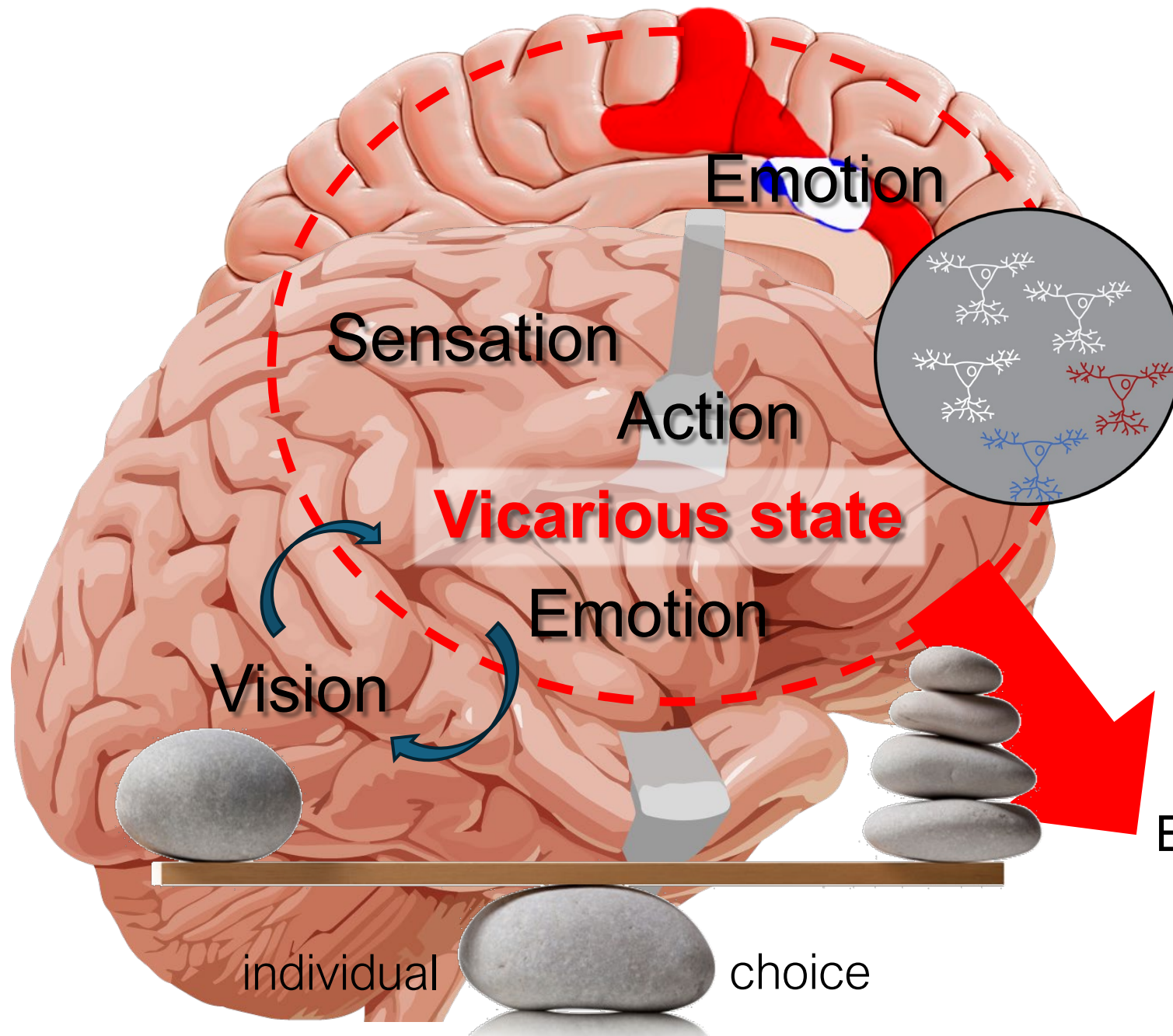
M. Carrillo



E. Soyman

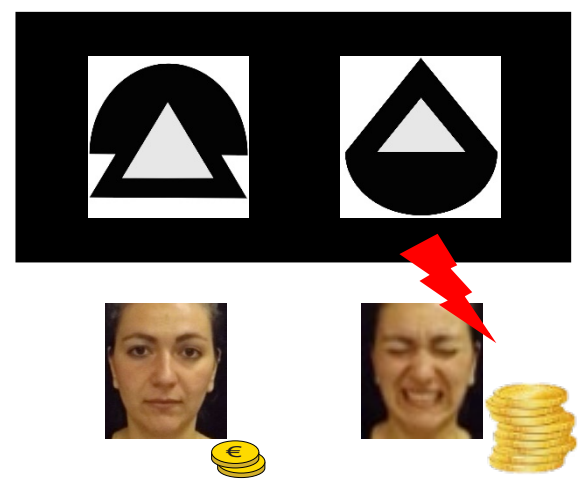


R. Rajendran

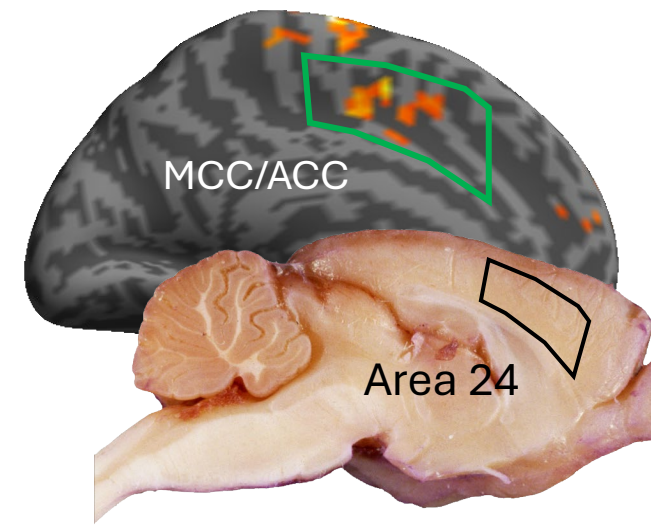
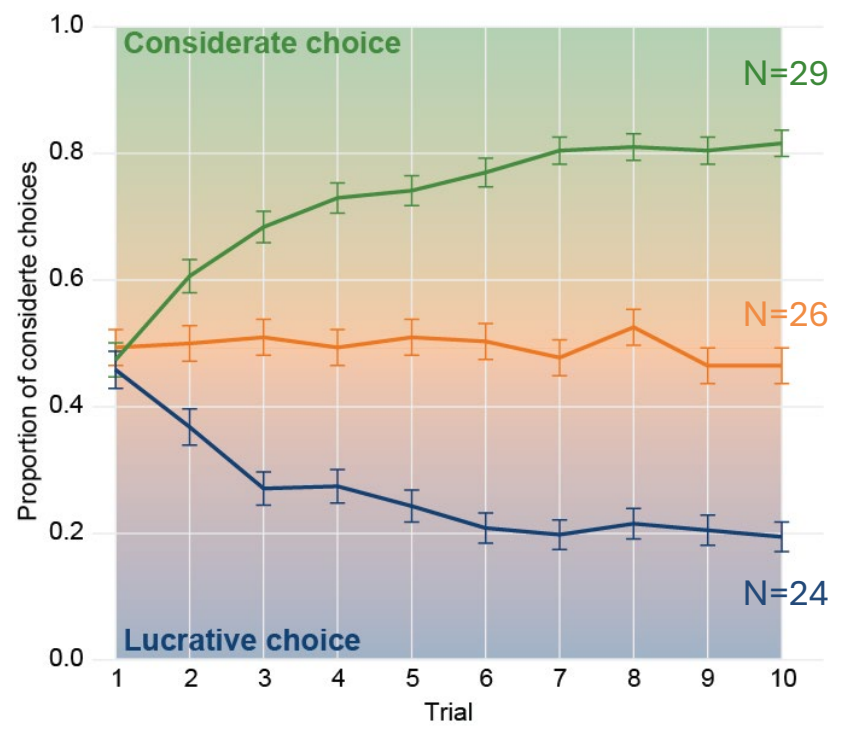
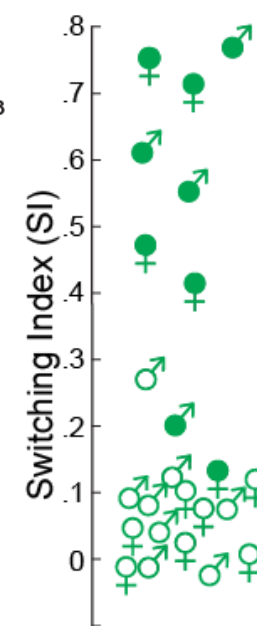
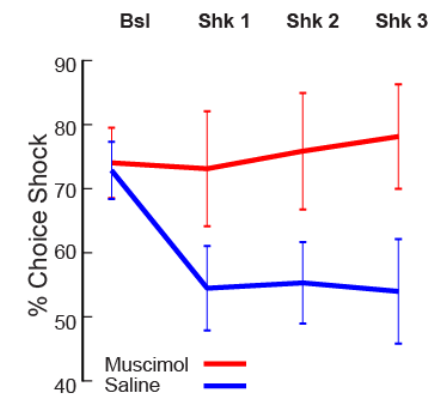
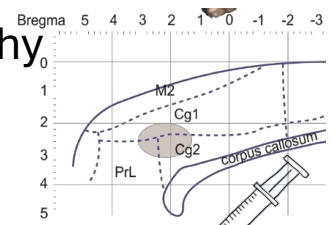
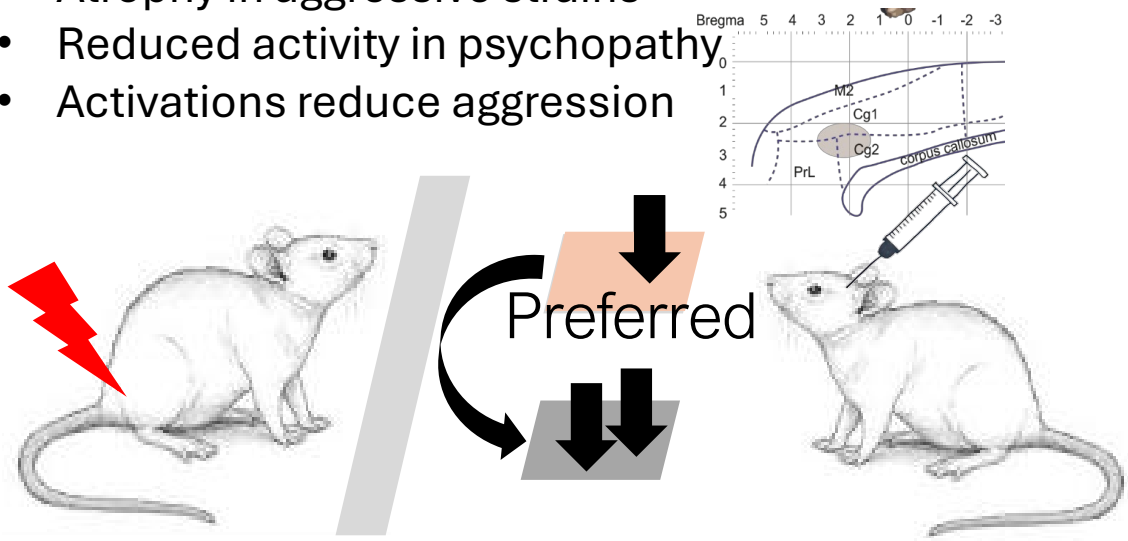


Emotional Contagion
Harm avoidance
Social Learning

Is sharing the emotions of others influencing our decisions and behaviors?



- Atrophy in aggressive strains
- Reduced activity in psychopathy
- Activations reduce aggression



value updates

How much the pain you just caused alters the pain you'll predict the same action to cause in future