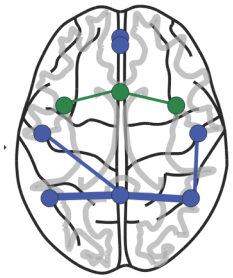
BRAINS AND SOCIAL NETWORKS:

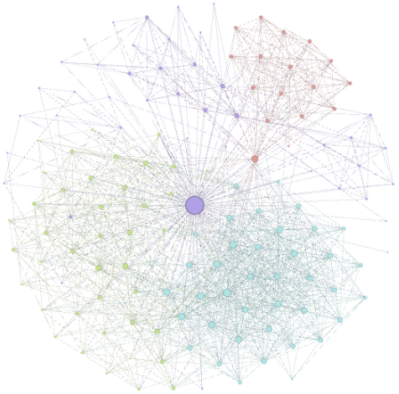
FUNDAMENTAL DIMENSIONS OF HUMAN EXPERIENCE

Emily Falk, Ph.D.

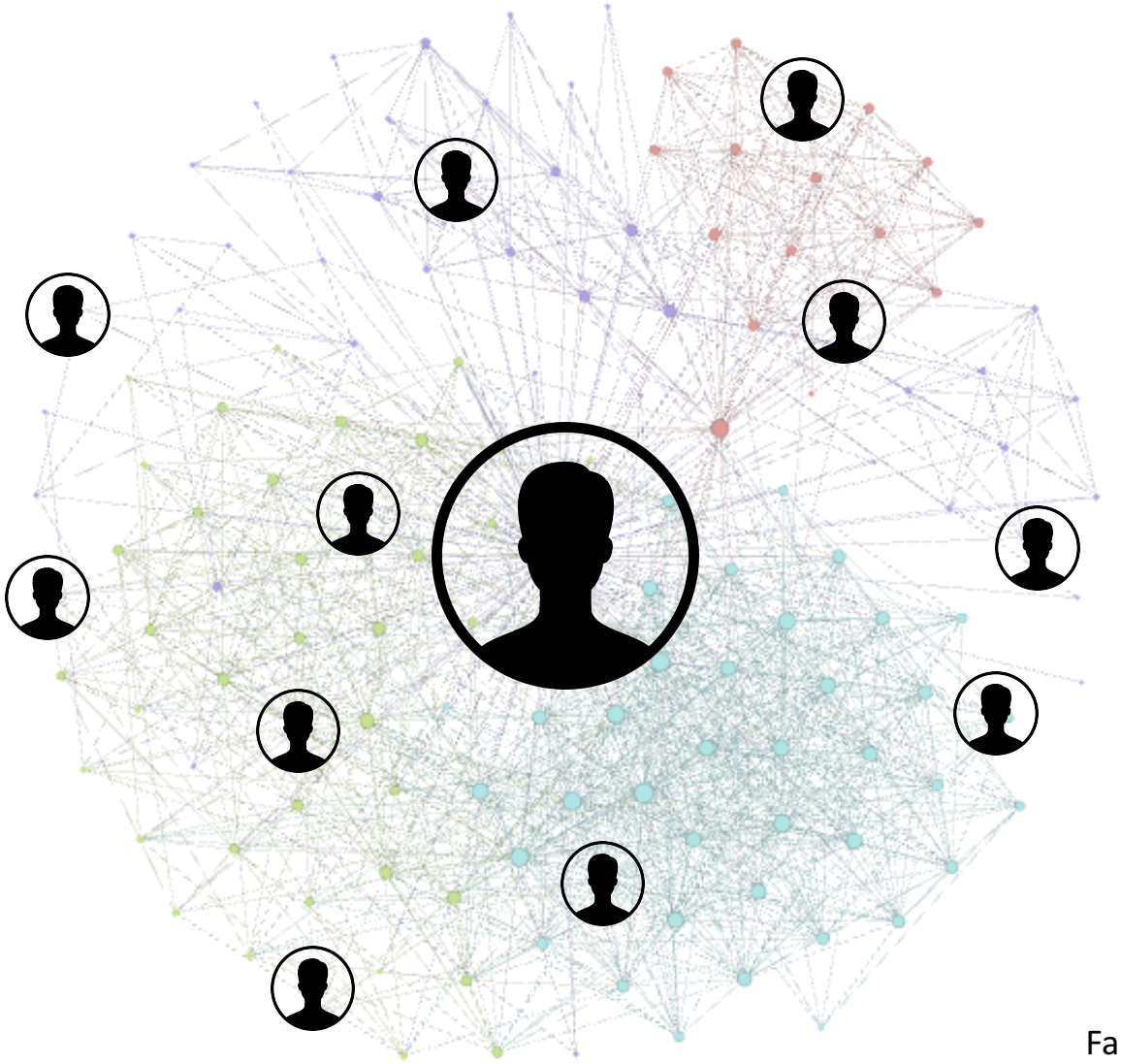


Decadal Survey:

Leveraging advances in social network thinking



HOW DO IDEAS AND BEHAVIORS SPREAD?



Falk & Bassett, 2017, TiCS
Falk & Scholz, in press, Annual Review of Psychology

What makes a brain receptive to change?

Self-reports
(e.g., attitudes, intentions)

Follow-up

Behavior during baseline

Health messages

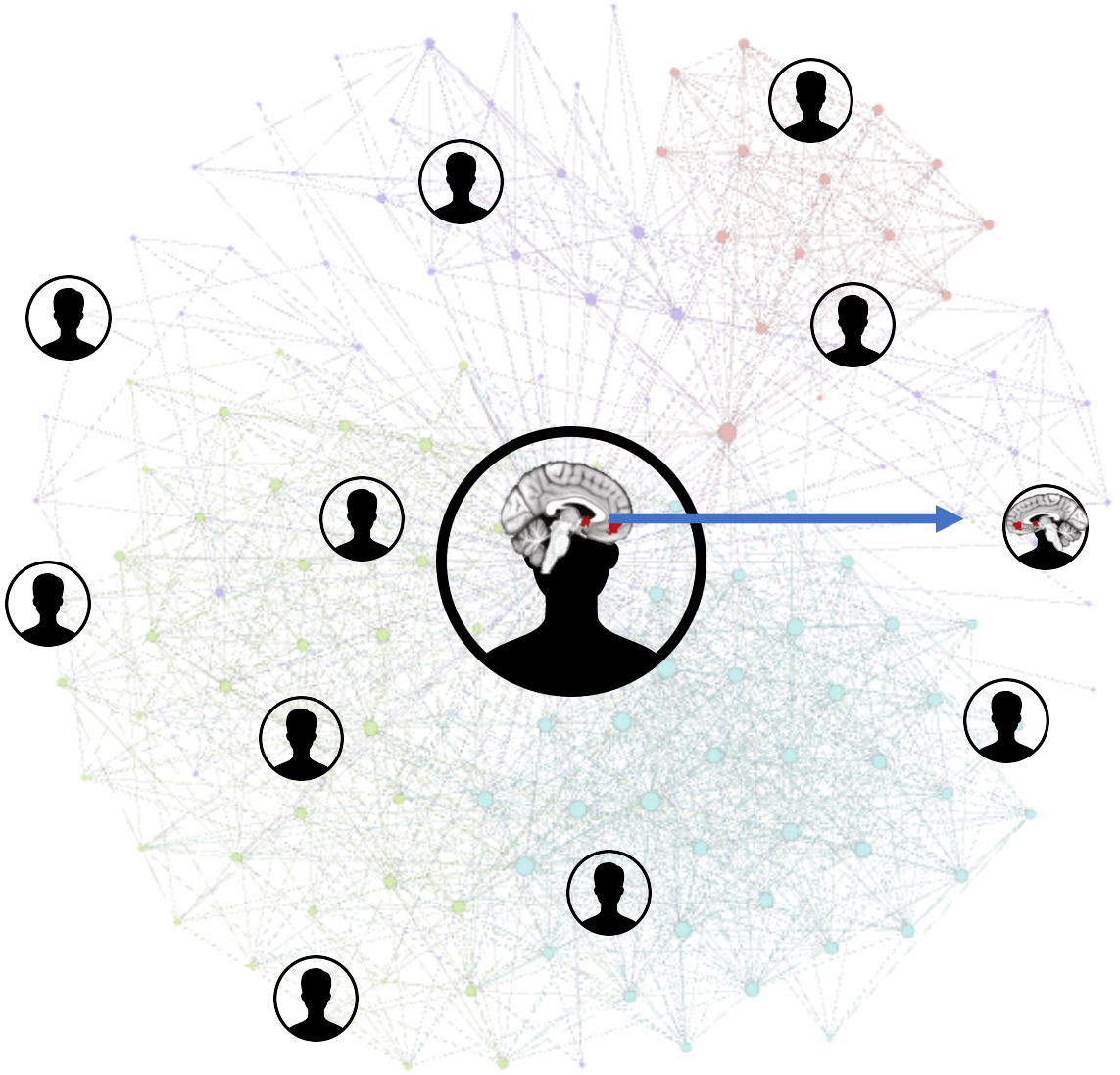
Behavior in weeks after

Behavior Change =

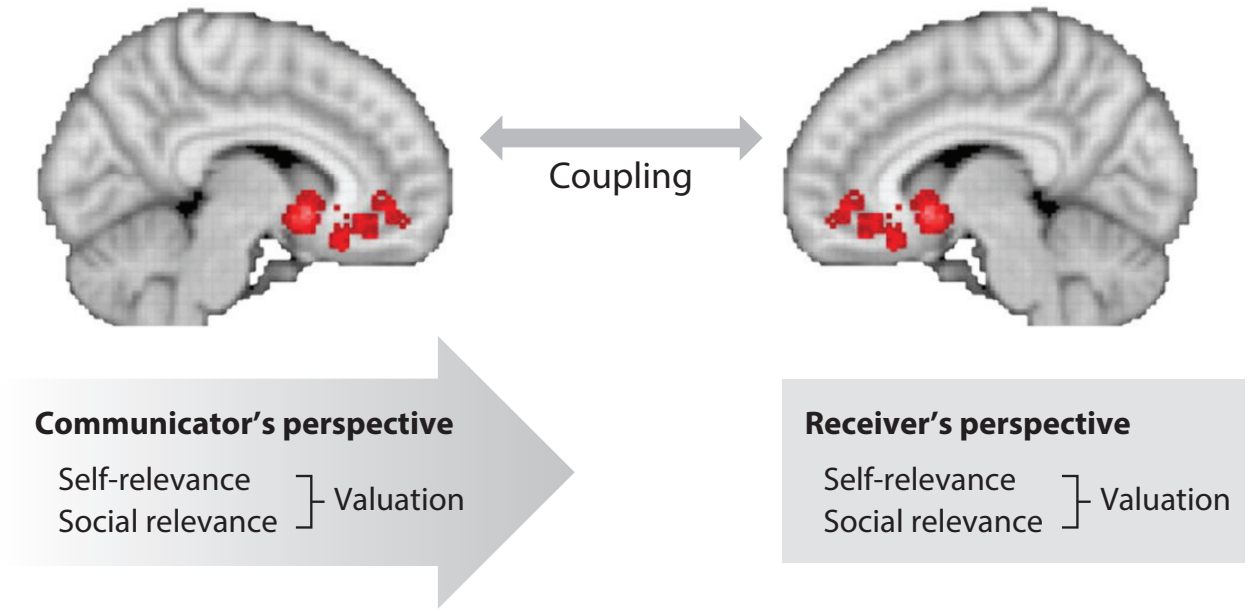
Behavior in weeks after

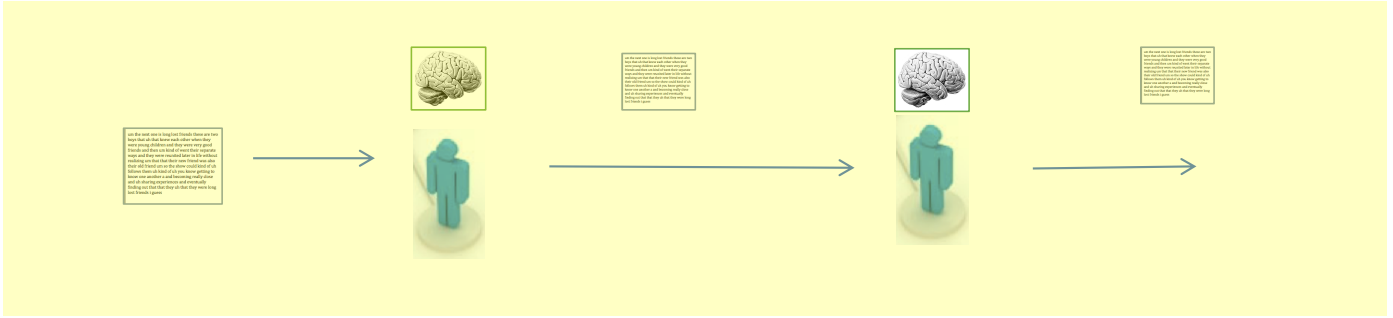
-

Behavior during baseline



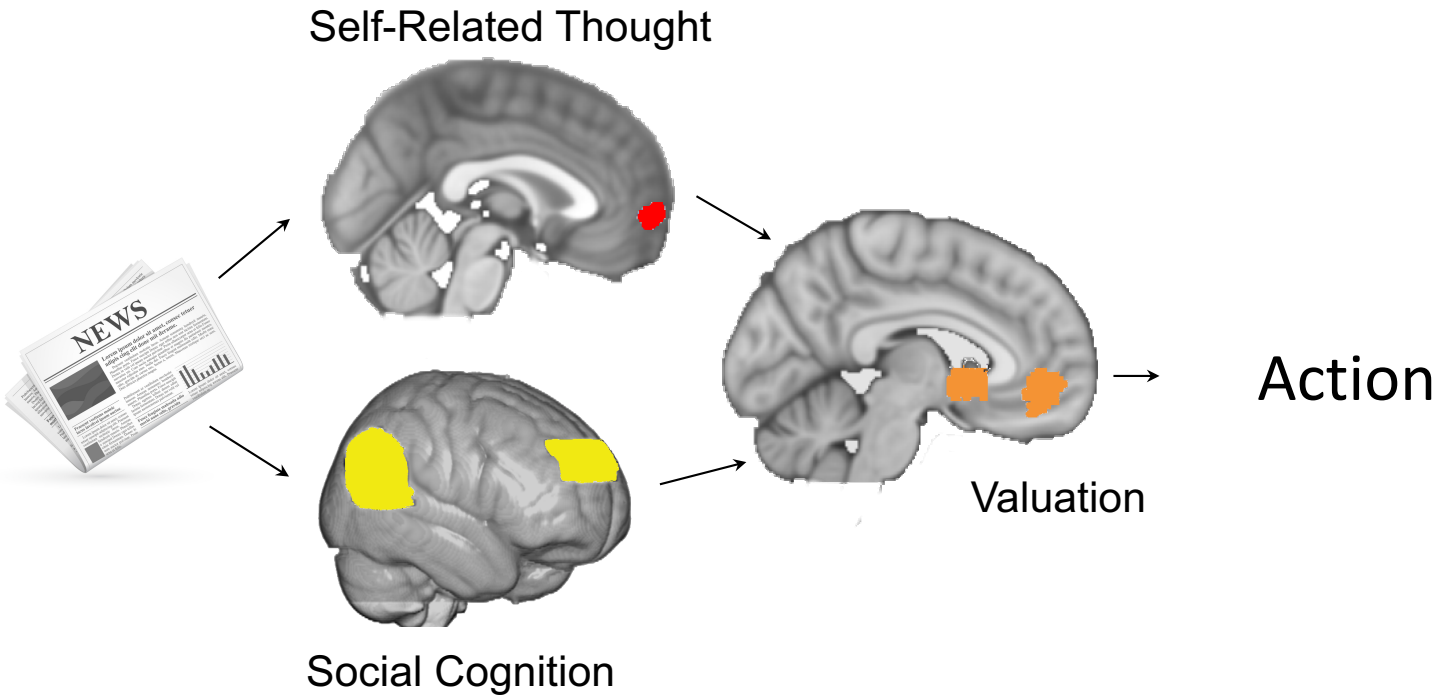
The brain's value system





Falk & Scholz, in press, Annual Review of Psychology

Value-based virality



Scholz & Falk, in press
Scholz et al., 2017, PNAS

Core values + messages →
less threat →
more behavior change

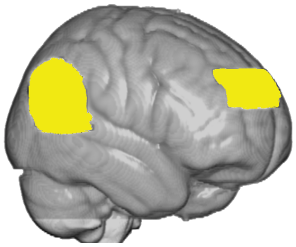
Falk et al., 2015, PNAS
Kang et al, in submission

INCREASING THE VALUE SIGNAL THROUGH VALUES-AFFIRMATION

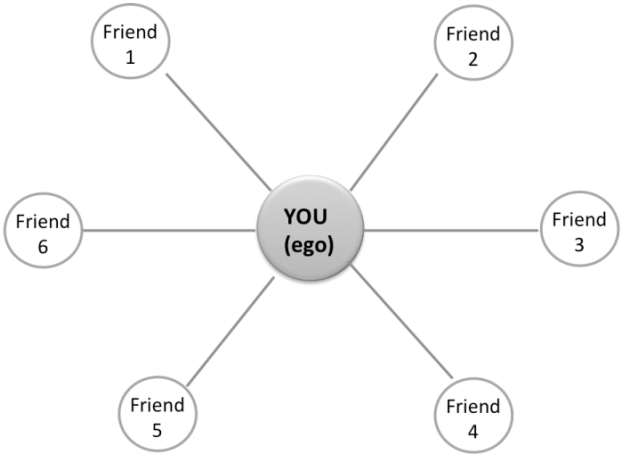
Falk et al., 2015, PNAS
Kang et al, in submission

Brokers vs. Closers

Brain regions implicated in thinking about the mental states of others

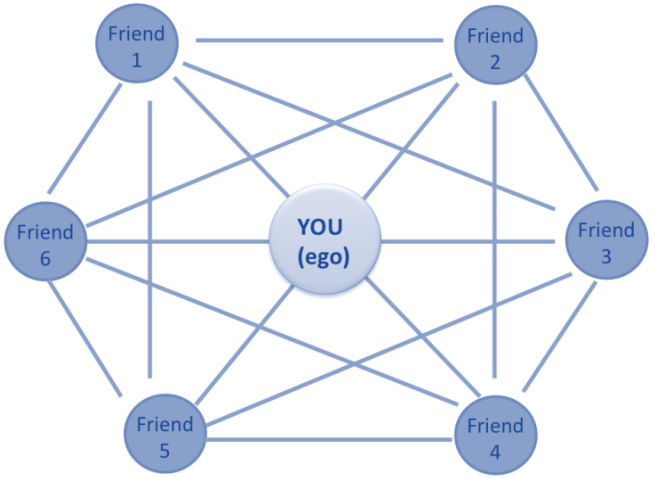


Higher Brokerage



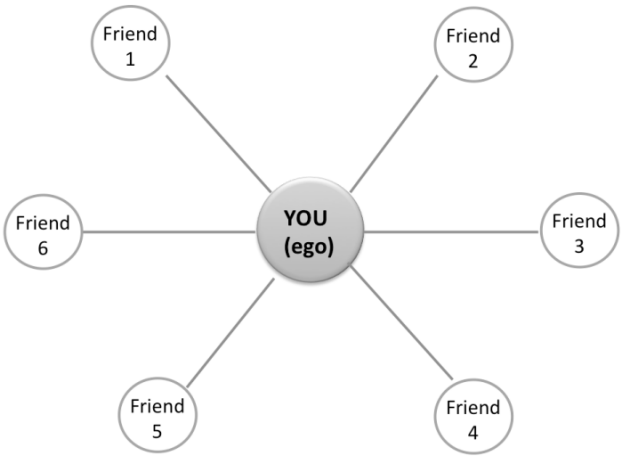
>

Higher Closure



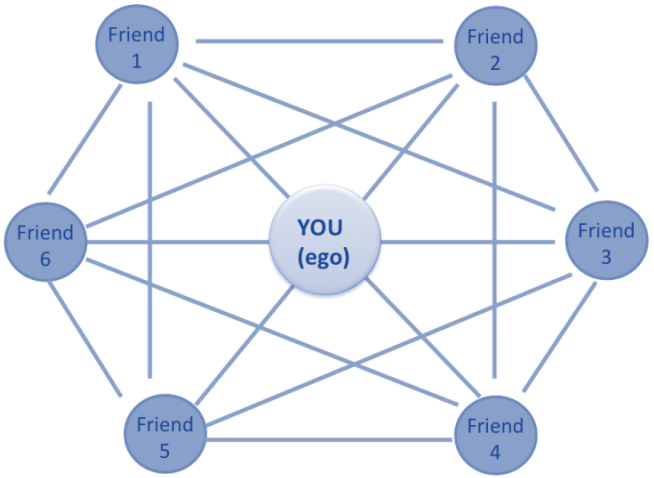
BROKERS VS. CLOSERS SHARING BEHAVIOR

Higher Brokerage



>

Higher Closure



Hypotheses

- People who have more opportunities for idea brokerage in their networks will:
- Show increased activity in the brain's mentalizing network
  - When considering recommendations for others
- Will make more use of the mentalizing network
  - When using peer feedback to update their recommendations

O'Donnell et al., 2016, SCAN

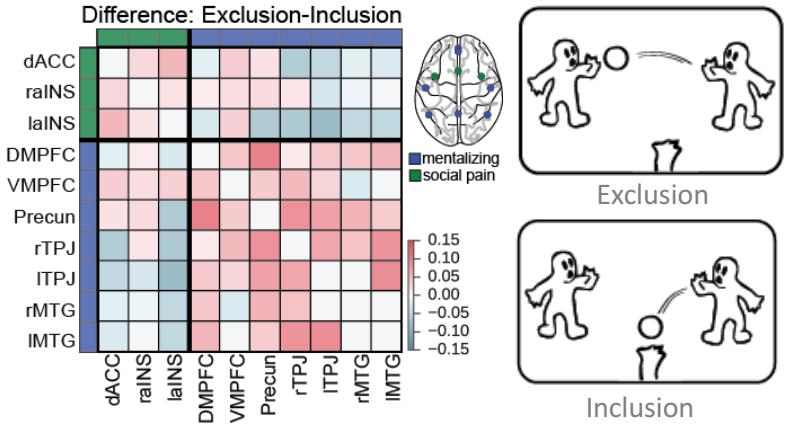
Social network structure and peer influence

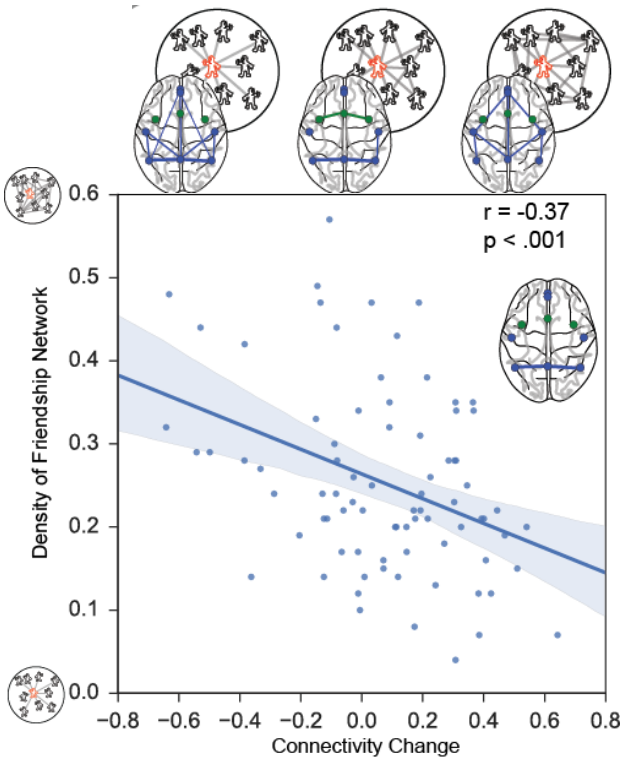
- Teens with differing network structures show similar tendencies to conform to peer feedback in deciding what to recommend to others
- Underlying mechanisms may differ
- Next steps: testing causality and optimizing interventions

O'Donnell et al., 2016, SCAN

Brain connectivity dynamics during social interaction reflects social network structure

How does the brain respond to social exclusion?

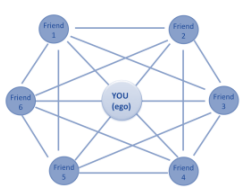


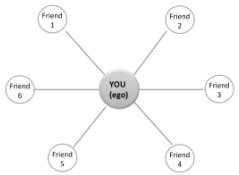


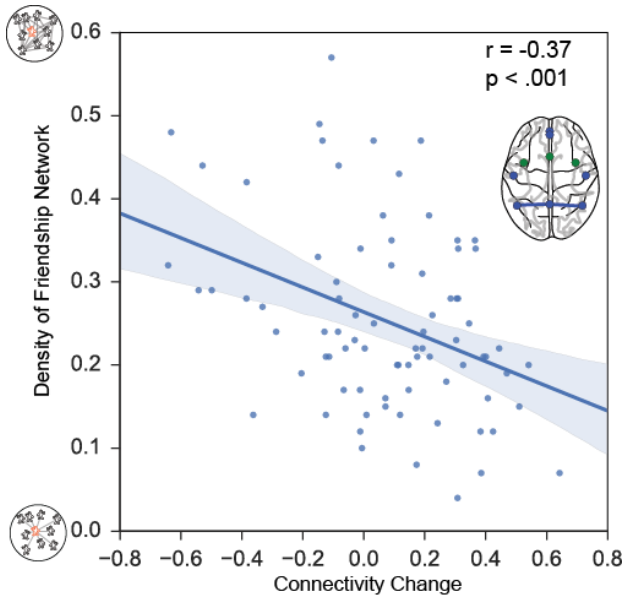
Disruption of ties through social exclusion has a marked effect on our thoughts and feelings; however, such effects can be tempered by broader social network resources.

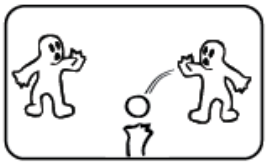
Schmaezle et al. 2017 PNAS

BRAIN CONNECTIVITY DYNAMICS DURING SOCIAL INTERACTION REFLECTS SOCIAL NETWORK STRUCTURE

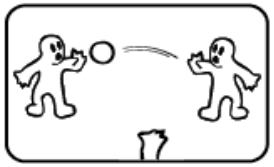








Inclusion

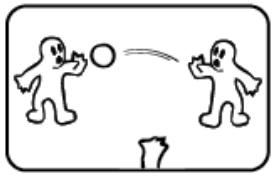


Exclusion

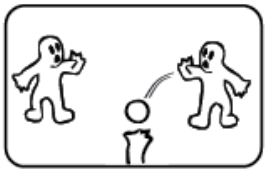
Schmaezle et al. 2017 PNAS

BRAIN CONNECTIVITY DYNAMICS DURING SOCIAL INTERACTION REFLECTS SOCIAL NETWORK STRUCTURE

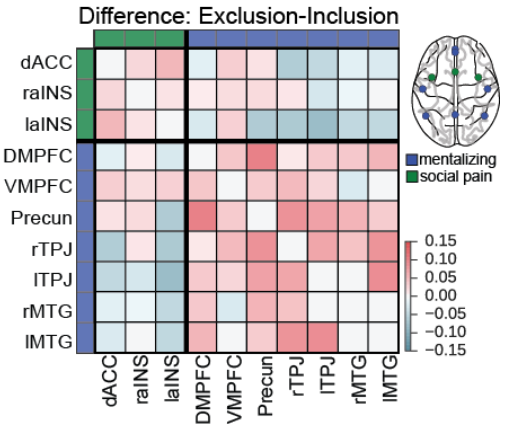
How does the brain respond to social exclusion?

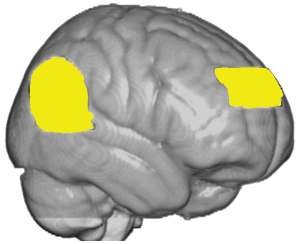


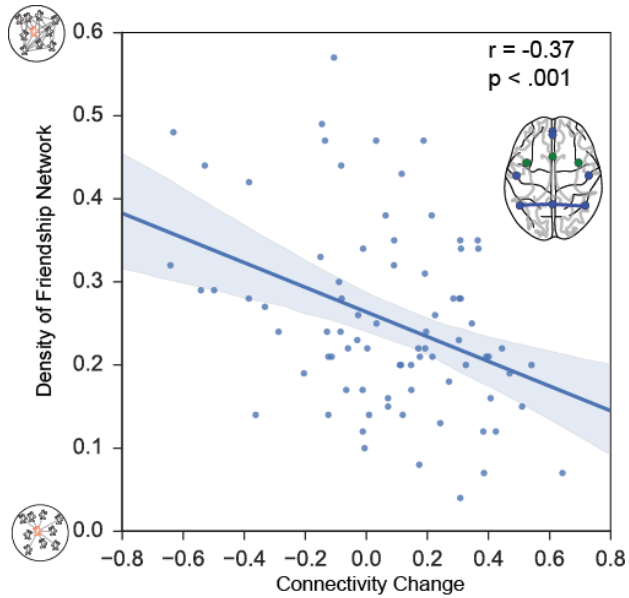
Exclusion



Inclusion

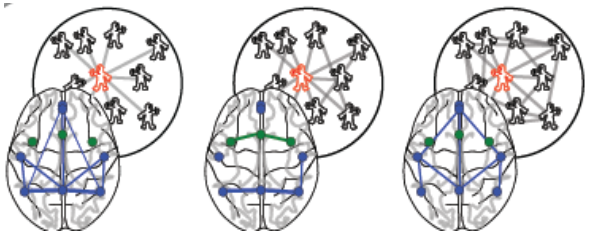


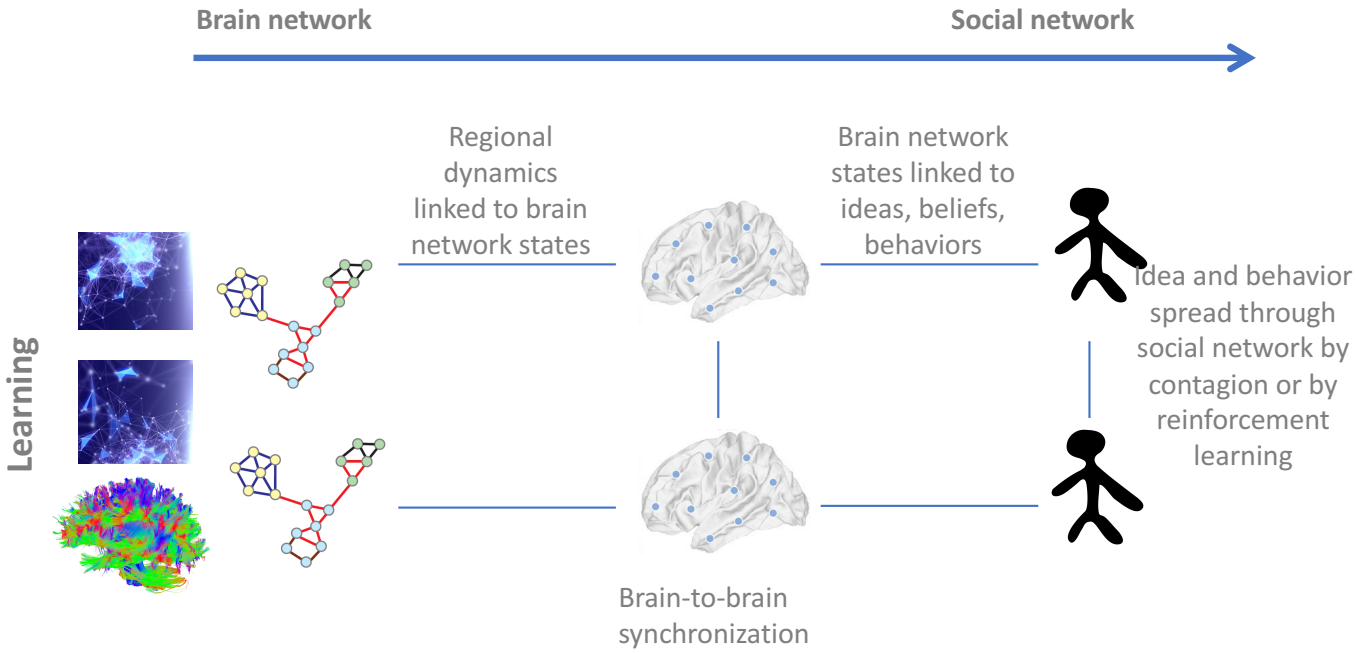




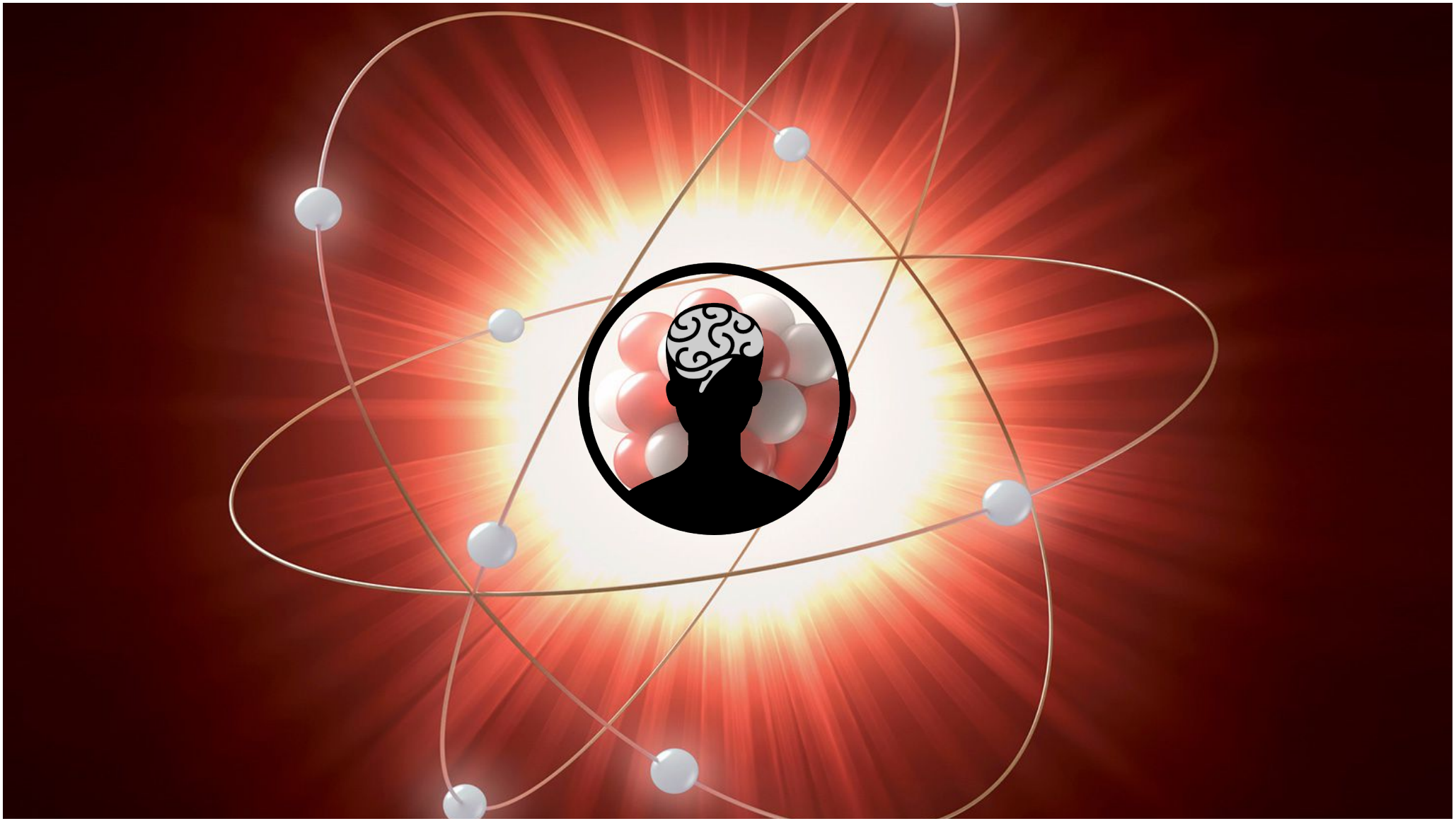
Schmaezle et al. 2017 PNAS

Next steps: brain-social multilayer network





Falk & Bassett, 2017, TICS

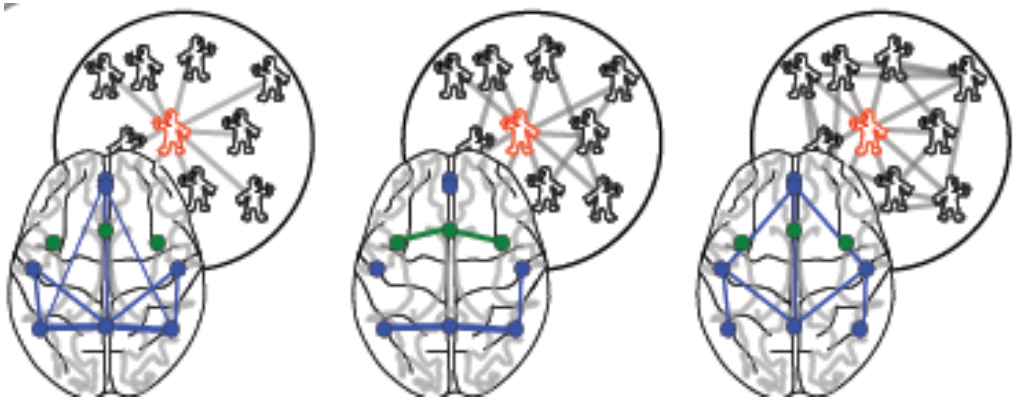


BRAINS AND SOCIAL NETWORKS:

FUNDAMENTAL DIMENSIONS OF HUMAN EXPERIENCE

Why do ideas spread in some contexts and not others?

Who is likely to be most influential in different social contexts?



How do people learn the structure of the social world?

How can we construct optimal interventions to change behavior?

How can we construct optimal interventions to promote well being?

How can we optimize motivation, learning and performance?

Summary

- Neuroscience helps us understand and *predict* psychological responses and behavior
  - Could realize major gains by applying new tools from network science
- Essential for theoretical and practical advances is understanding:
  - Mechanisms that drive the atoms of the social network universe
  - Social context in which brains operate

Collaborators

Funding

University of Michigan
Injury Research Center

Thank you

For copies of our papers: falklab.org

To collaborate with us: falk@asc.upenn.edu

To tell us about the awesome work you do: @falklab