

# Lecture 4 - A problem in theory?

The Social Brain: Critical Perspectives on Science, Society and Neurodiversity

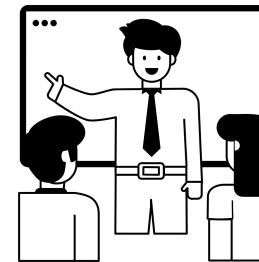
Richard Ramsey



# Today

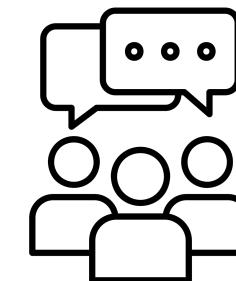
## Part 1

- A problem in theory?



## Part 2

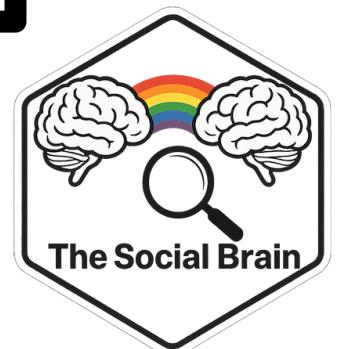
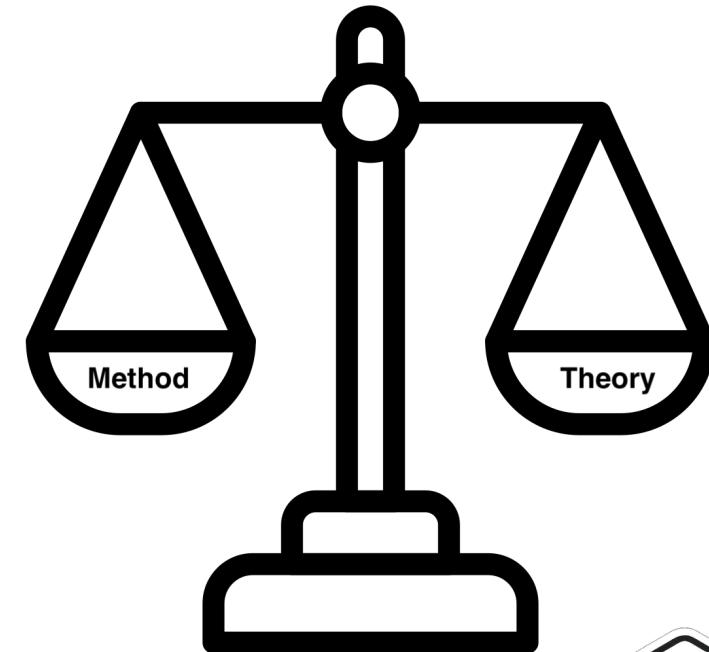
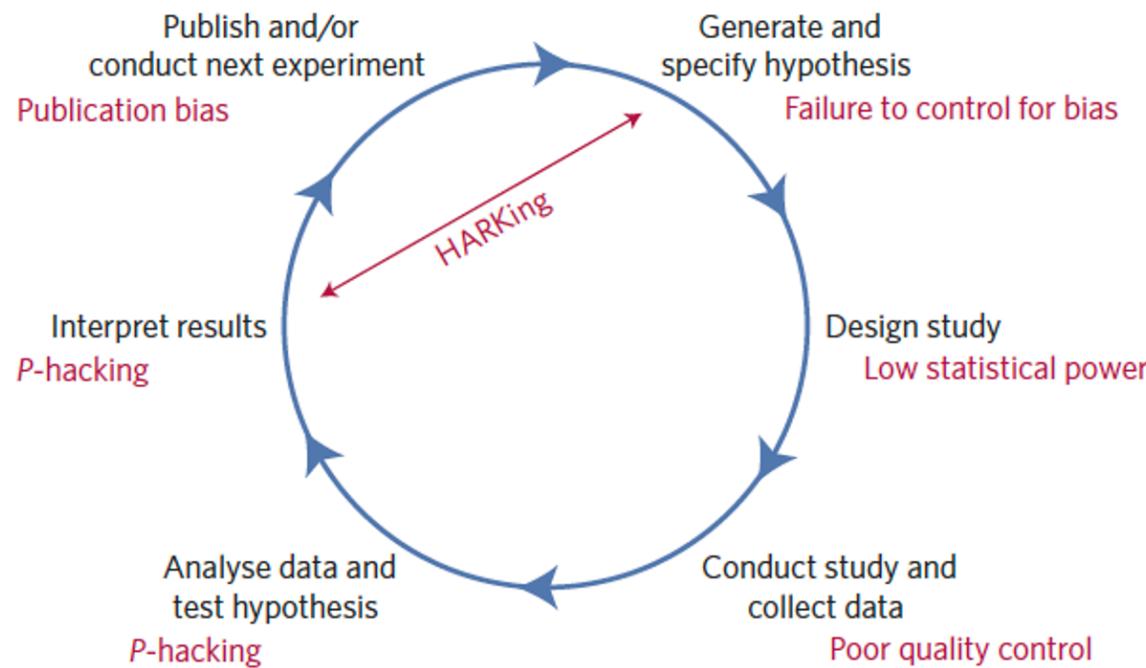
- Read articles and discuss



# Context



# Unreliable methods, but what about theory?



# A problem in theory

Without a sufficiently well-developed theory, then it is hard to interpret results in a meaningful way.



- Anything that turns up as statistically significant can be used to tell a story or sell newspapers.
- At most, only 0.4% of adolescent wellbeing is related to screen use - which only slightly surpasses the negative effect of regularly eating potatoes.

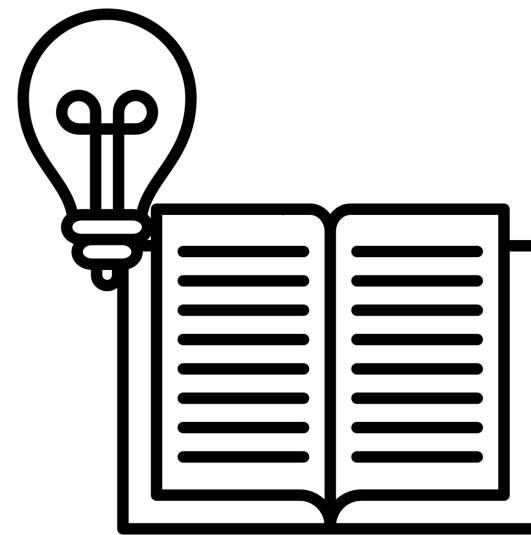


# A problem in theory

Predictions are often impossible to falsify because of infinite wriggle room...



Data



HARKing



Wriggle room



# Theory as a blueprint for science



Evidence / Facts /  
Experiments



Theory



Organised knowledge



# Theory before the test

## Are psychological scientists ready to test hypotheses?

Inputs to informative hypothesis tests:

- Concept formation
- Developing measures
- Establishing relationships between concepts
- Boundary conditions and auxiliary assumptions
- Deriving statistical predictions



# Concept formation

What do we mean by terms such as screen time, intrinsic motivation or depression?



## Why is this important?

- Lots of time and money is spent having pointless debate and argument about reproducibility, when key terms are not adequately defined



# Measurement

## Measurement schmeasurement

We demonstrate that psychology is plagued by a measurement schmeasurement attitude: questionable measurement practices are common, hide a stunning source of researcher degrees of freedom, pose a serious threat to cumulative psychological science, but are largely ignored.

(Flake & Fried, 2020)



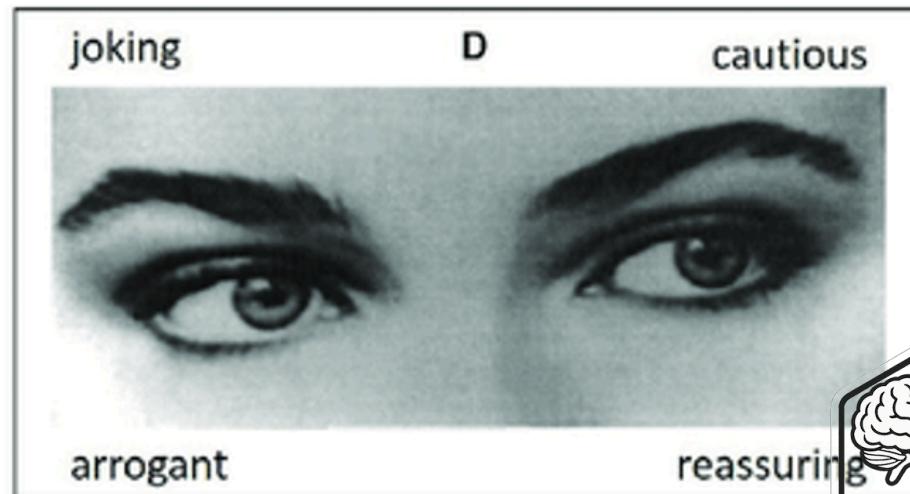
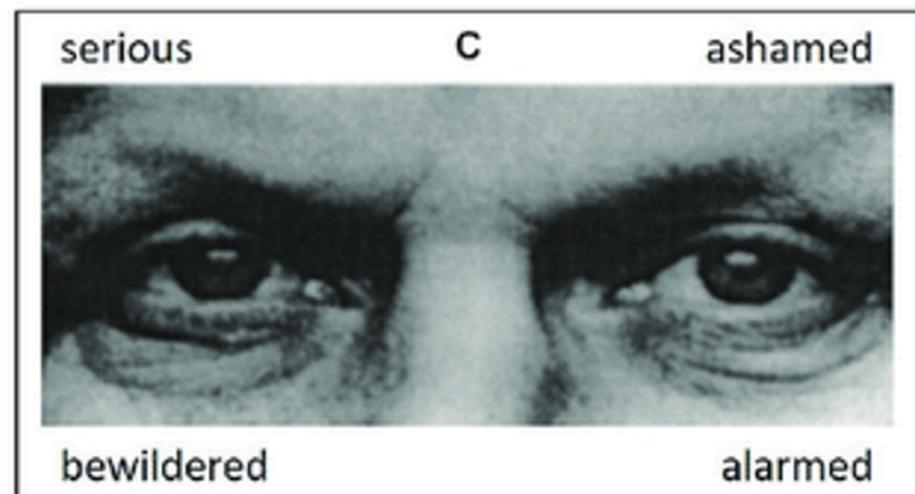
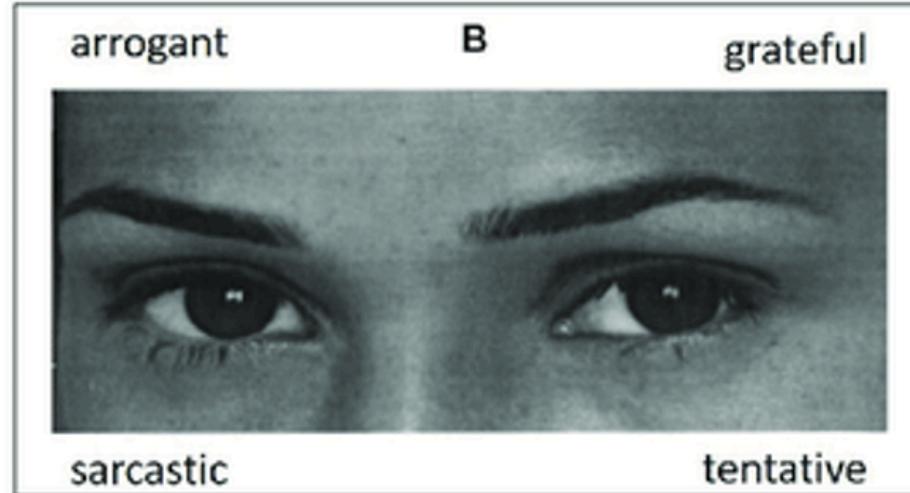
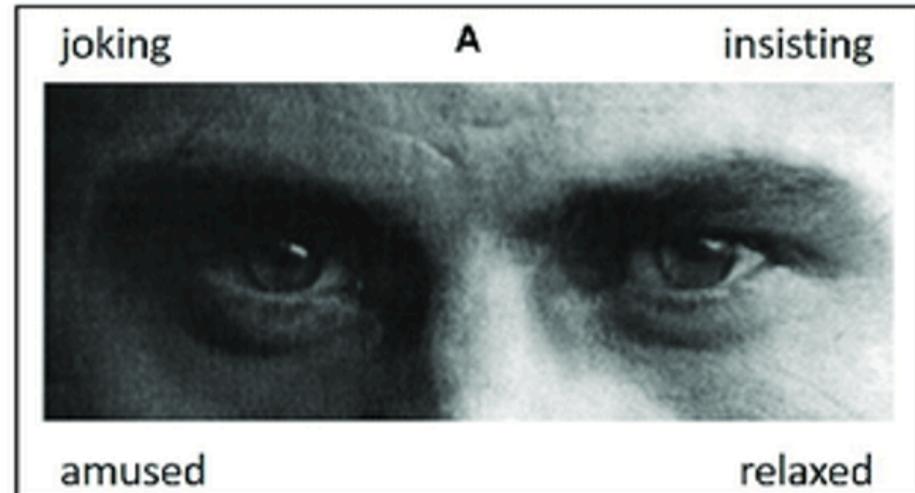
# Measurement



- Are the measures valid and reliable?
- And are they measuring the concept of interest?



# RMET - Example



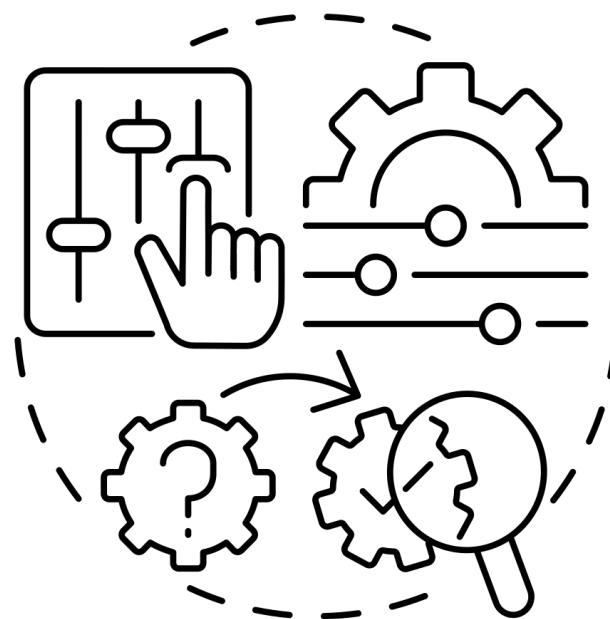
# RMET - Problems

[[some stuff here describing the problems]]



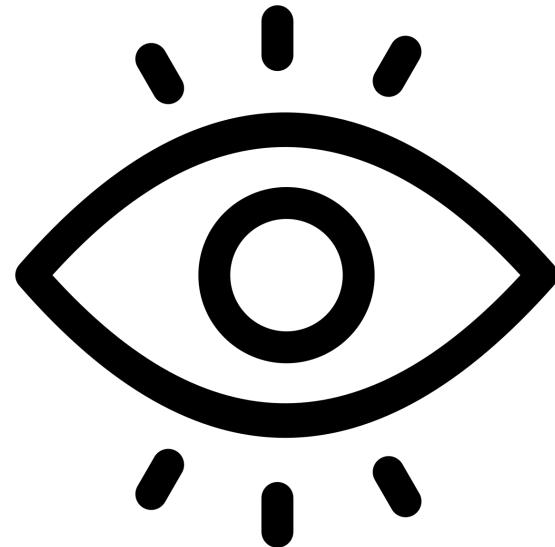
# Relationships between concepts

Once concepts are defined, we need a causal model of how they relate to each other.

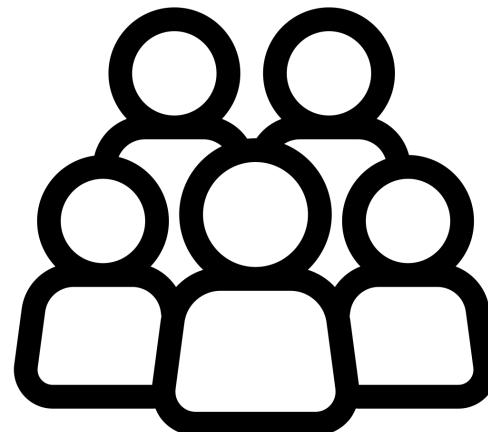


# Boundary conditions

A good theory is clear about its boundary conditions – where does the theory apply and where is beyond its scope?



Basic vision vs. social cognition



Individual differences



Cultural variation



# Why is there a lack of good quality theory?

- OK, these seem like sensible ideas. But they are not **new** ideas?
- Paul Meehl was writing about this in ([1967](#)).

Question for the class:

- Why don't researchers do more “theory” before the test?



# How can we improve theory building?



# How can we improve theory building?

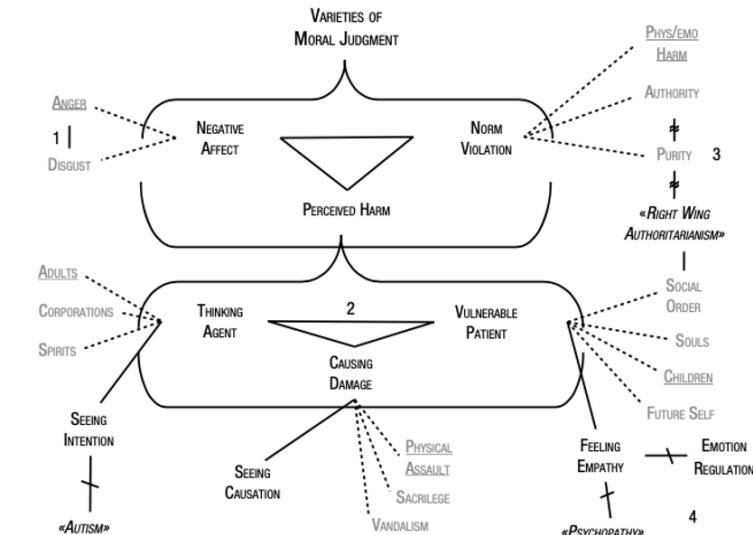
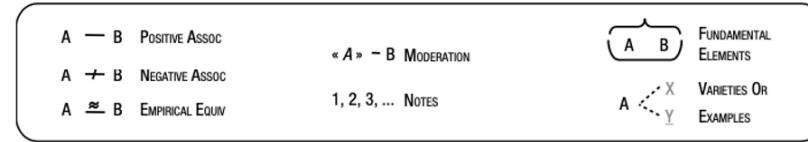
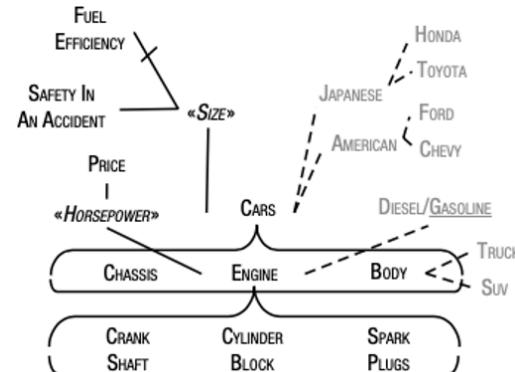
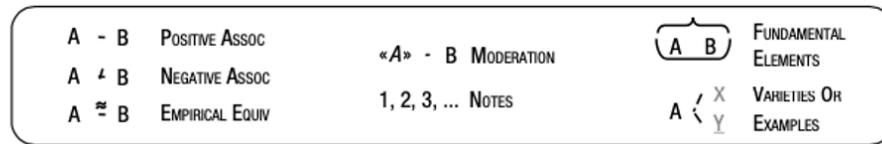
- This is hard and it is generally undervalued

I'll provide two examples:

- Theory Mapping
- Formal theory



# Theory mapping



1: ANGER AND DISGUST ARE HIGHLY OVERLAPPING (CAMERON, LINDQUIST, & GRAY, 2015)

2: PERCEIVED AGENCY, CAUSATION & PATIENCY ARE MUTUALLY REINFORCING (DYADIC COMPLETION; GRAY, SCHEIN, & WARD, 2014)

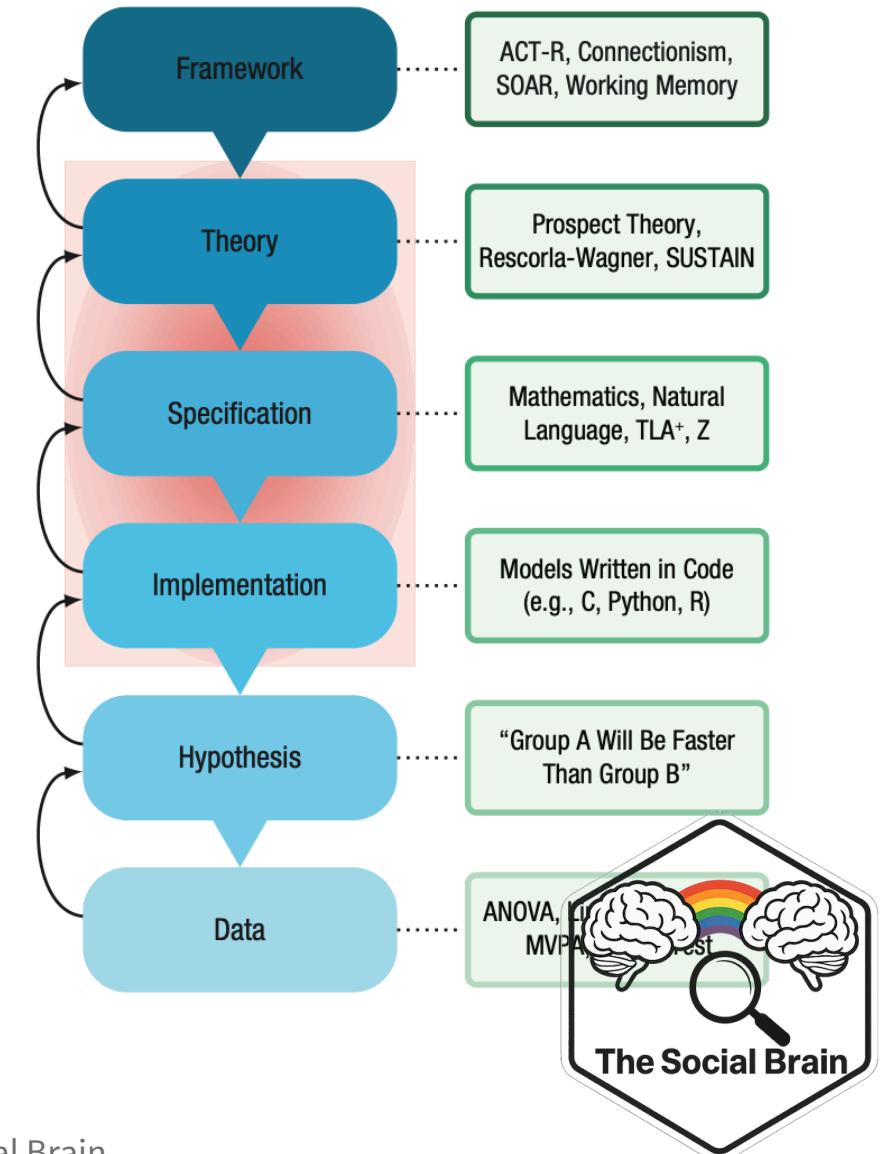
3: CORRELATION BETWEEN AUTHORITY AND PURITY,  $r = .80$  (FIG 3; GRAHAM ET AL., 2011) AND CORRELATION BETWEEN PURITY AND RWA,  $r = .70$  (TABLE 7; GRAHAM ET AL., 2011)

4: OPERATIONALIZATION OF PSYCHOPATHY: SRP-III (PAULHUS, HEMPHILL, & HARD, 2009)



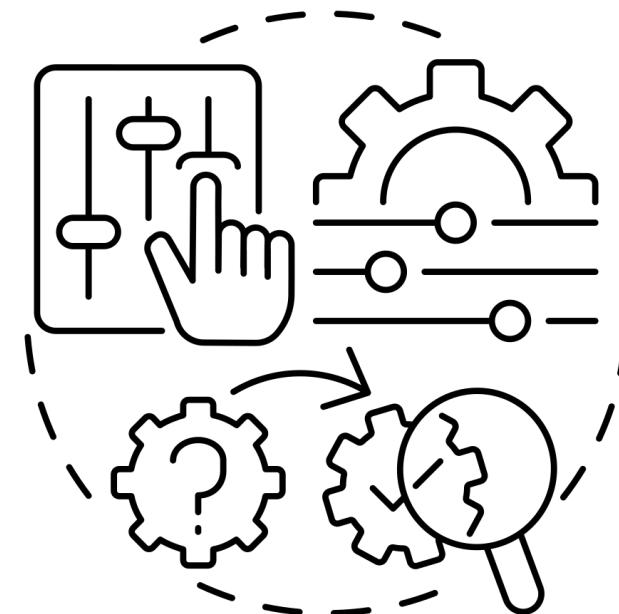
# Formal theory

- Psychological theory tends to be narrative
- Predictions are ordinal
- Formal theory is a mathematical description that can give rise to quantitative predictions

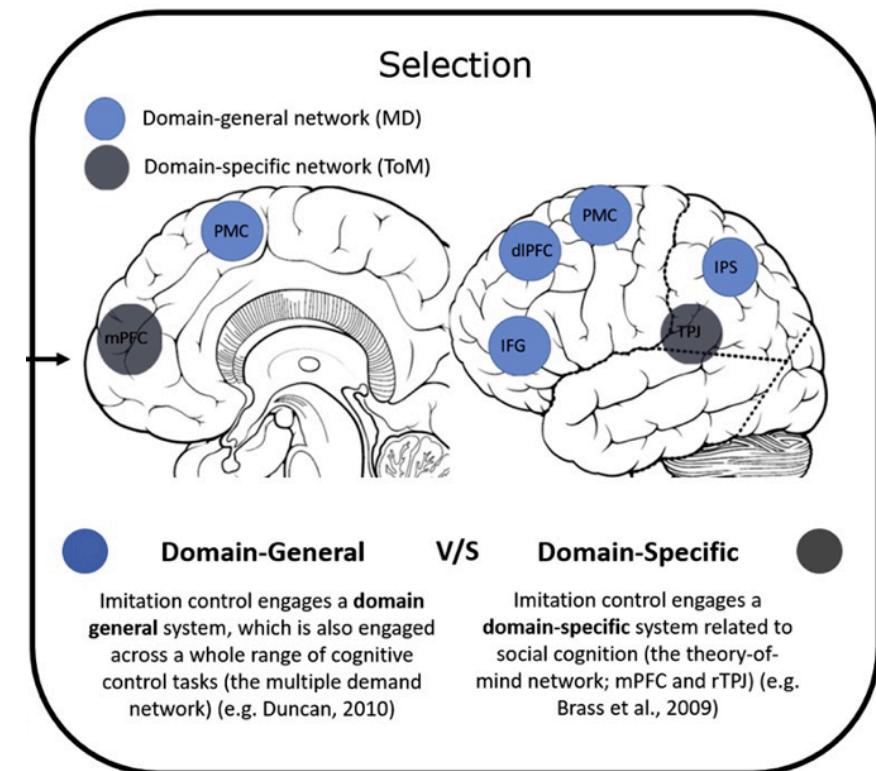
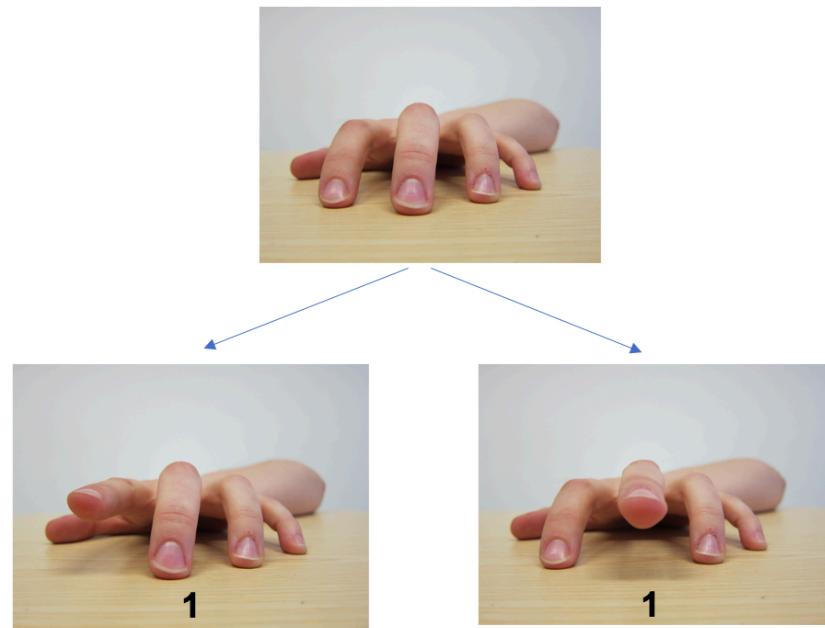


# What are the benefits of formal theories?

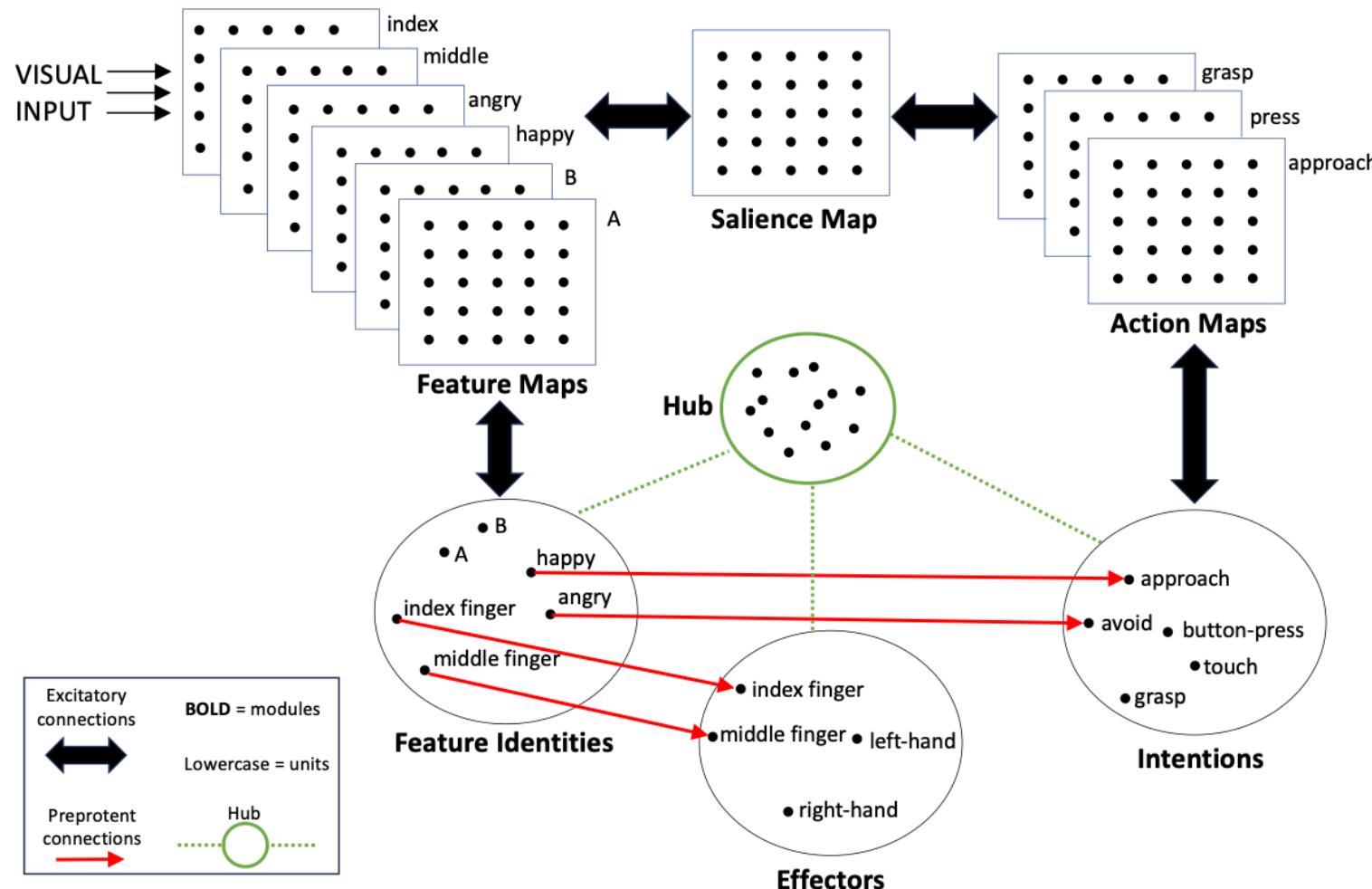
It forces researchers to be explicit about parts of the system under investigation and how they are linked together (e.g.,  $E = mc^2$ ).



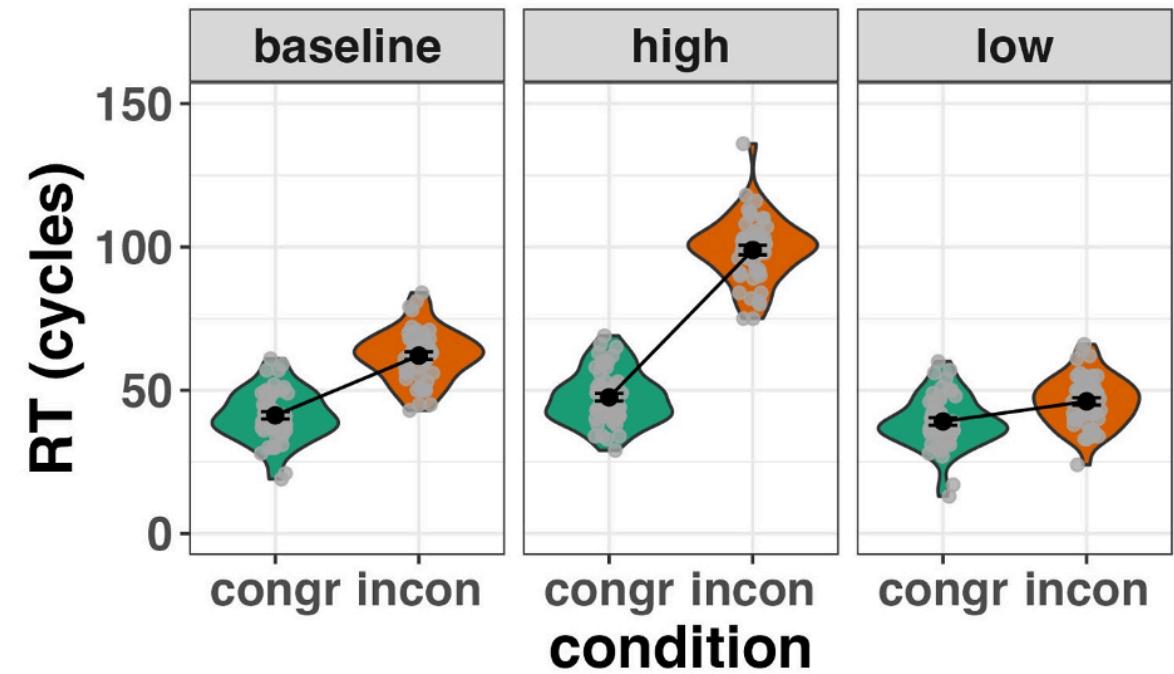
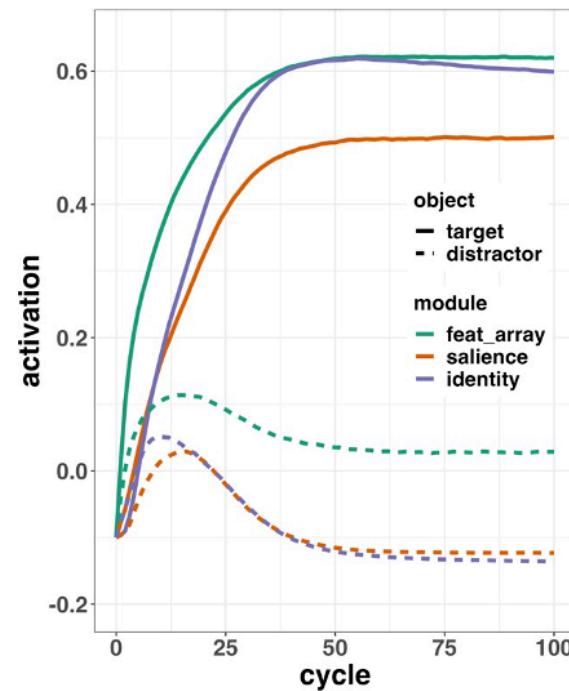
# Formal theory from my lab



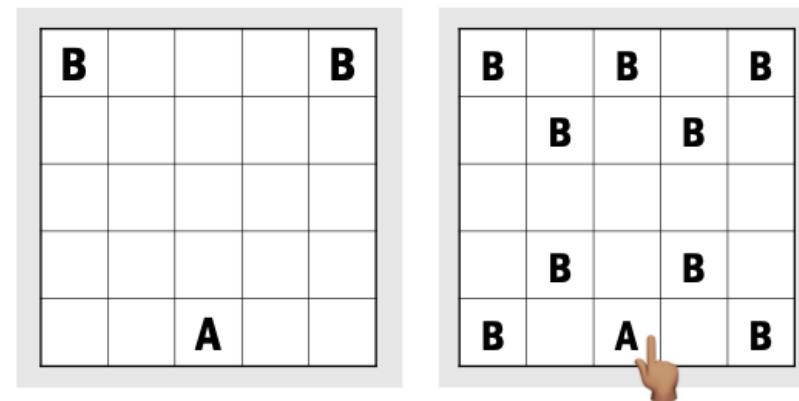
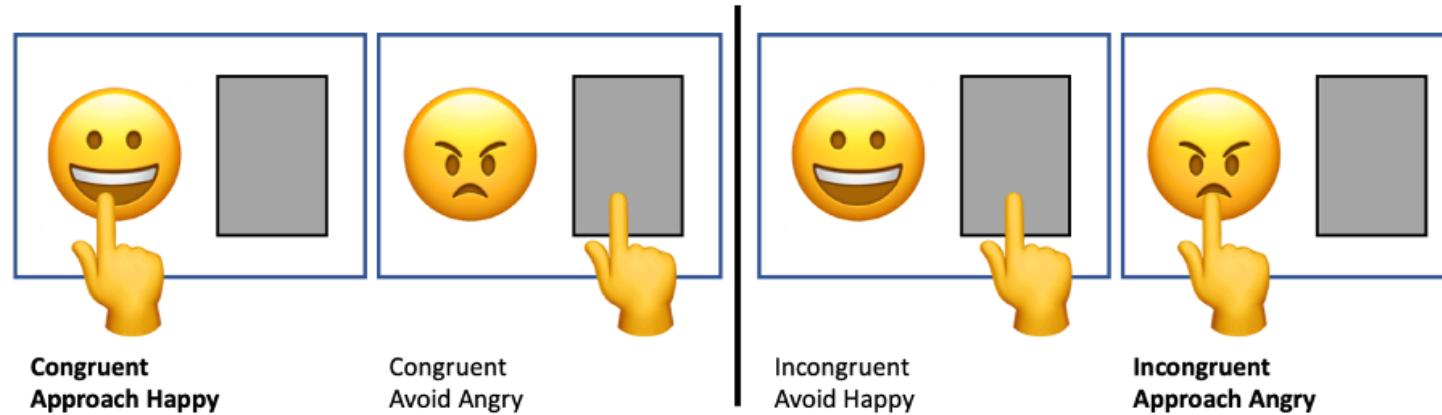
# Formal theory from my lab



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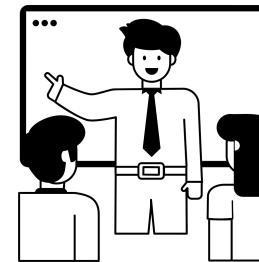
- The benefit of formal theory here is not that our model is “correct”, but that it is explicit and it can therefore be more easily be falsified.
- Formal theory reduces verbal wriggle room



# Today

## Part 1

- A problem in theory?



## Part 2

- Read articles and discuss



# Take a break



# Part 2 - Read and discuss



# Discussion material

- break into small groups (~ 5 per group)
- discuss aspects of the lecture
- discuss aspects of the journal article:  
<https://journals.sagepub.com/doi/full/10.1177/17456916209667>



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# Acknowledgements

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