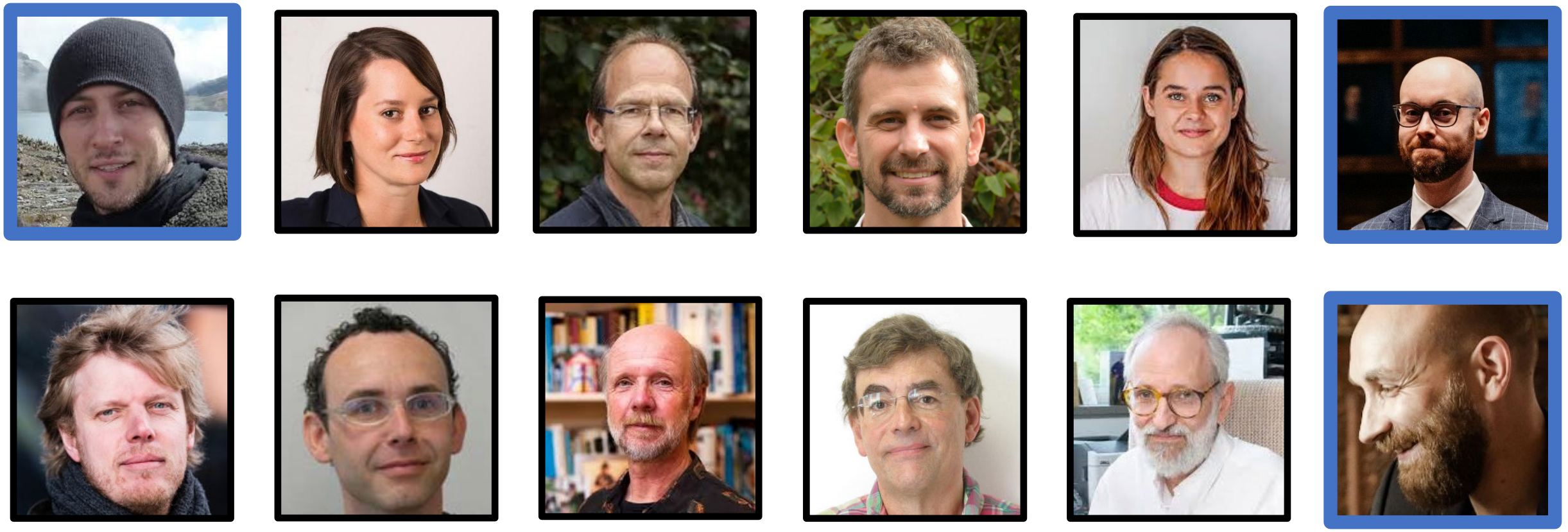
Section 2: Target Systems and Phenomena

A First Step Toward Formal Theory

The Example of Panic Disorder



Phenomena: “stable, recurrent, and general features of the world.” The things we want to explain.

Haig, 2005, *An Abductive Theory of Scientific Method,* p. 374

Does psychology even have phenomena?

Does psychology even have phenomena? **Yes!**

- Forgetting Curve
- Positive manifold of intelligence
- Stroop Effect
- Comorbidity between anxiety and depression
- Matching phenomenon

Does psychology even have phenomena? **Yes!**

Children learn to speak

Memory declines in older age

Facial expressions convey emotion

Parenting affects a child's mental health

People don't always do what they want to do

What do we **know** about panic attacks?

Phenomenon 1

Panic Phenomenology

Some people experience surges of intense fear and somatic symptoms that come on “out of the blue.”

Phenomenon 2

Individual Differences

Most people do not experience these attacks.

Phenomenon 3

Panic Disorder

Some people who experience a panic attack will develop recurrent attacks, persistent concern, and avoidance

Phenomenon 4

Non-clinical panic

Most people who experience a panic attack will ***not*** develop panic disorder.

Phenomenon 5

CBT Efficacy

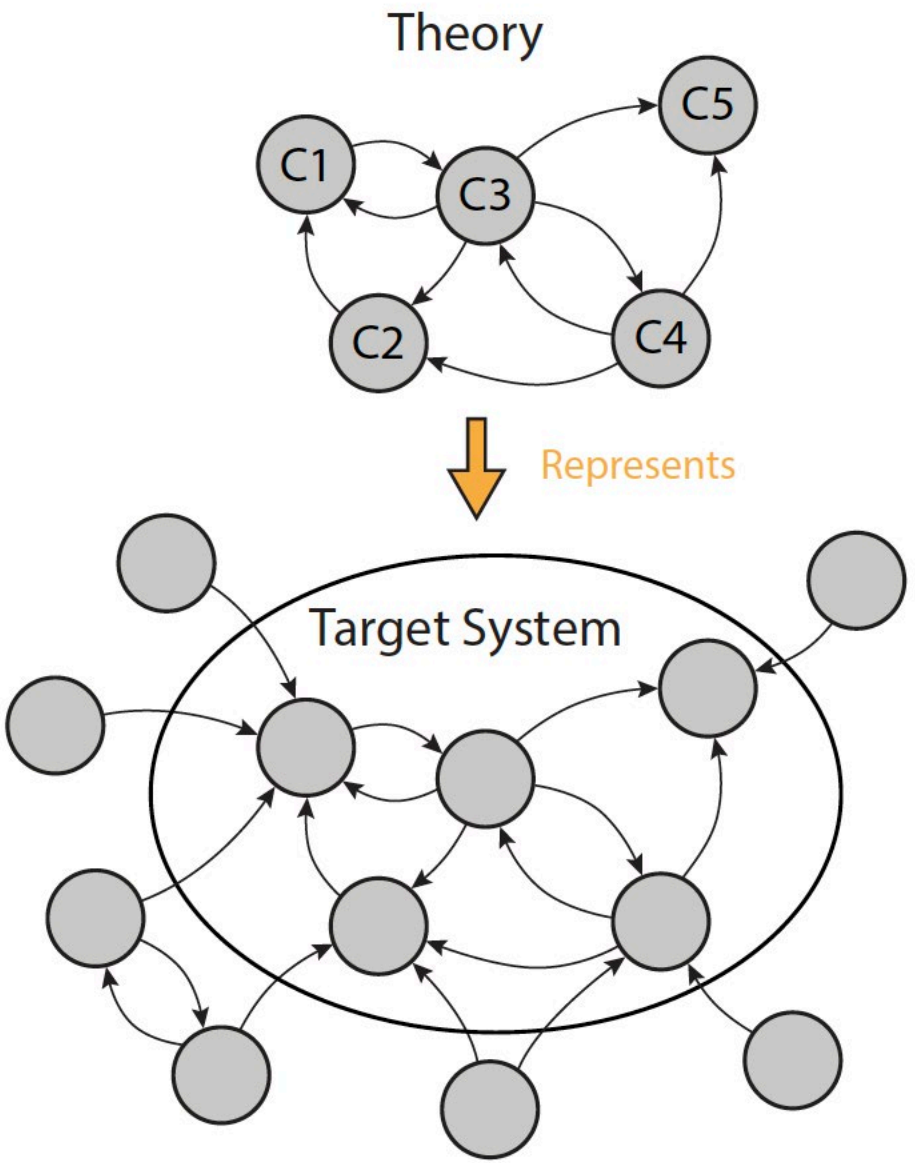
For those with panic disorder, cognitive behavioral therapy is an effective treatment.

Identify your phenomena of interest

What is the phenomenon you want to explain?

What are 3-5 things we **know** about this phenomenon?

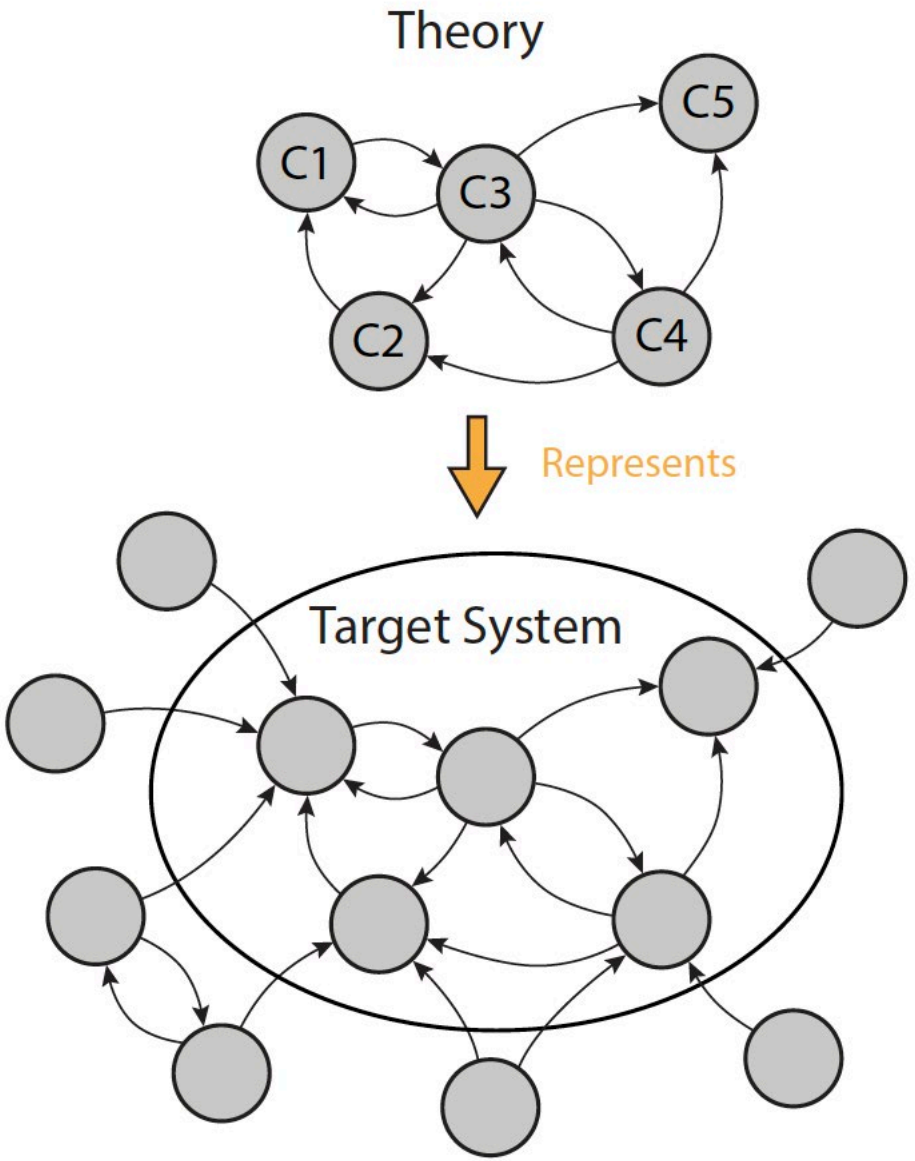
Target System: The parts of the real world that give rise to the phenomena of interest.


Theory
C1
C2
C3
C4
C5
Represents
Target System

Target System

What are the components of the system?

What are the relationships among those components?



Phenomenon: Positive manifold

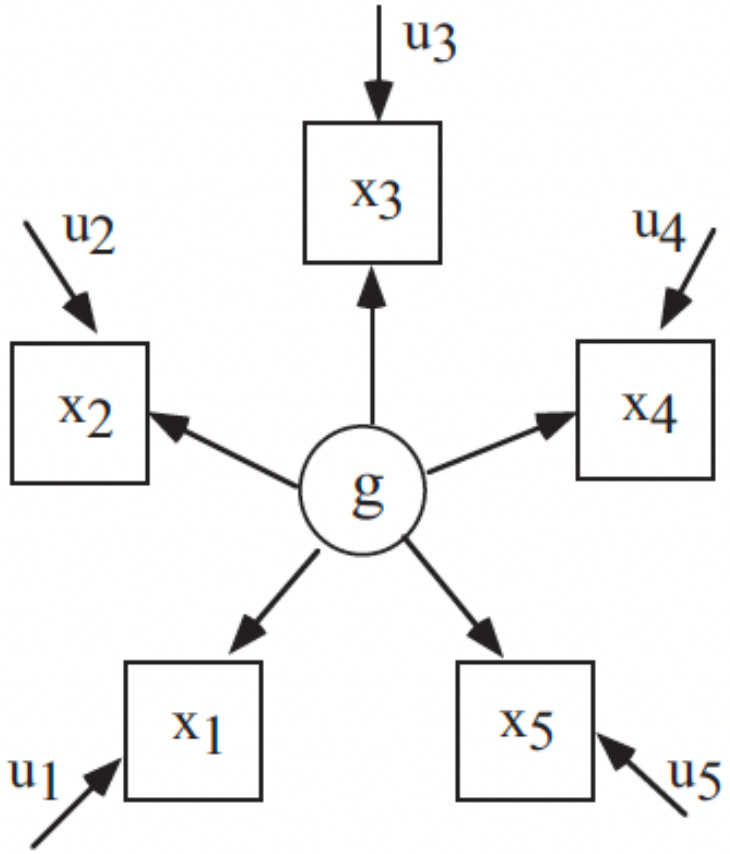
Components:

Cognitive processes (x)

General intelligence (g)

Relationships:

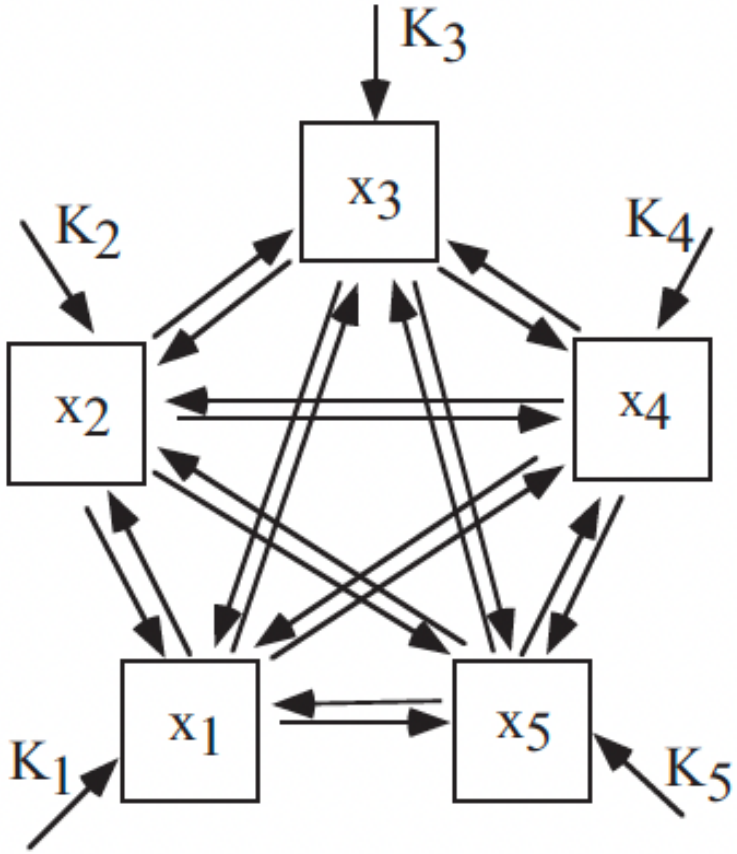
G causes x



Phenomenon: Positive manifold

Components:

Cognitive processes (x)

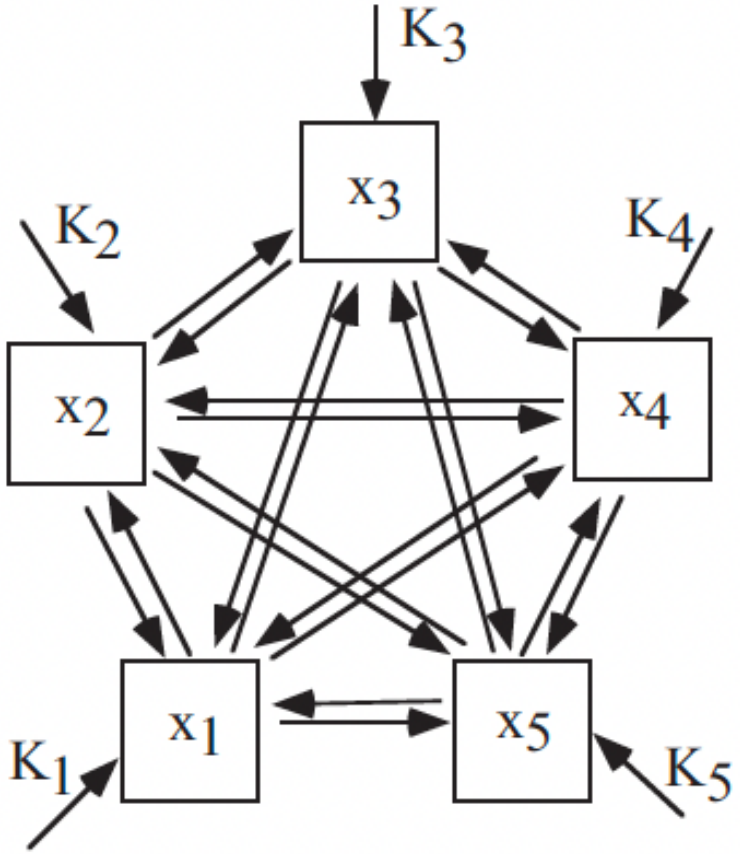


Relationships:

Mutualism

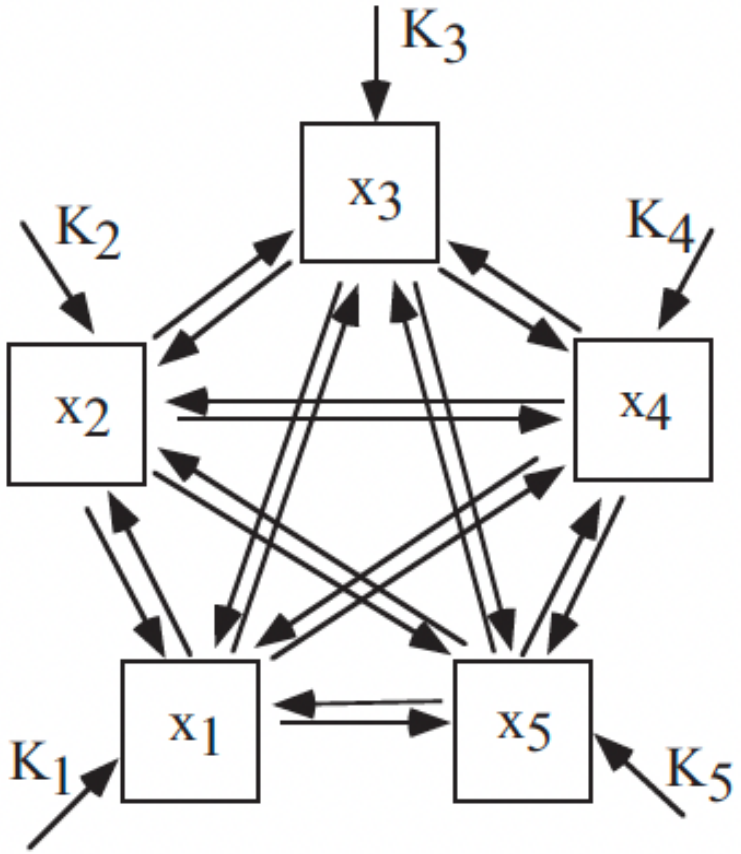
Phenomenon: Positive manifold

Theory: Mutualism



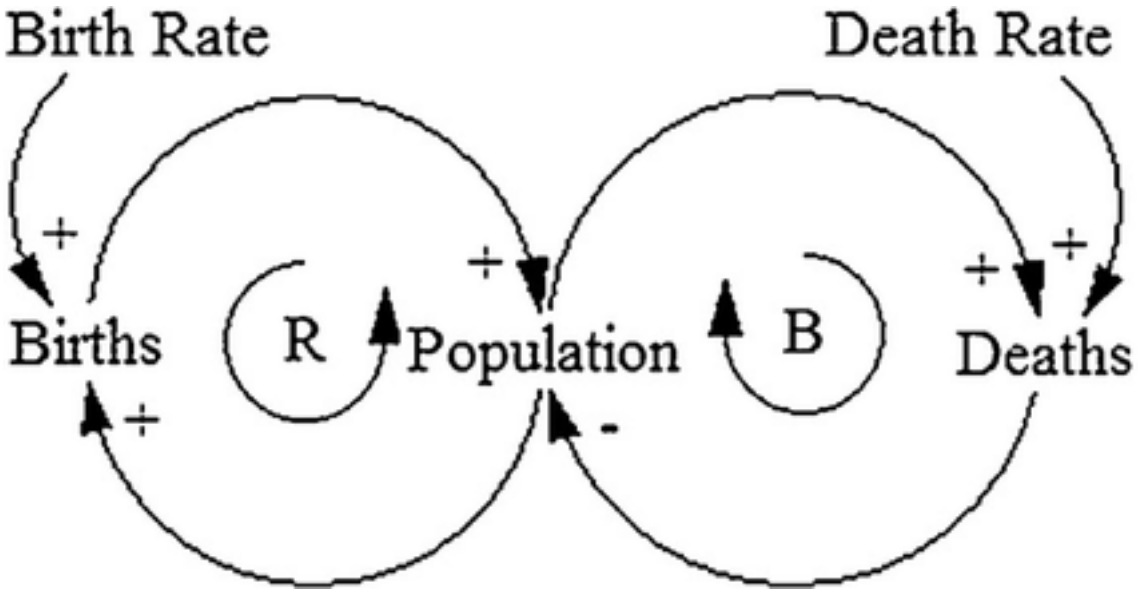
Diagrams: A helpful tool for thinking and communicating about your target system

Causal Diagrams

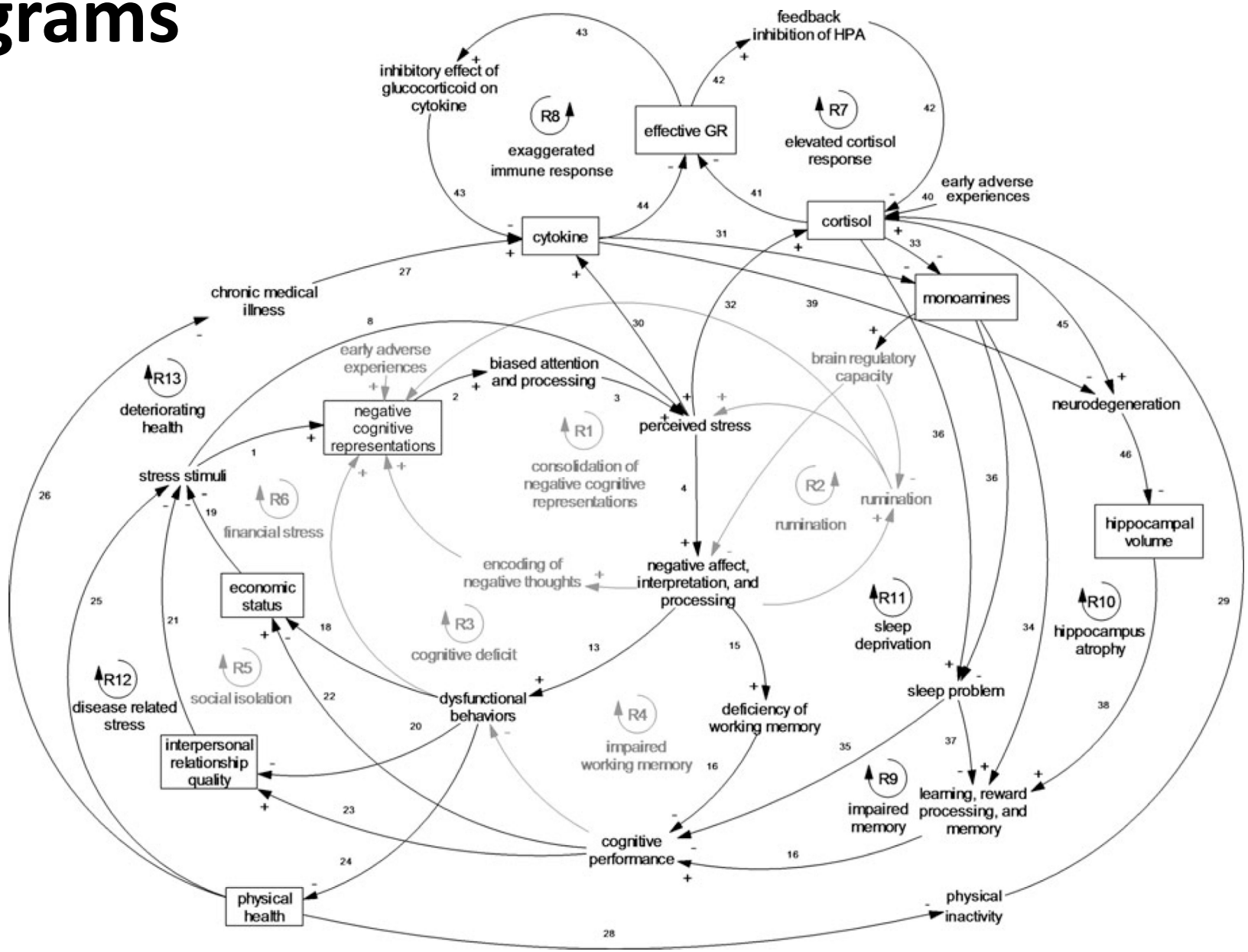


van der Maas, 2016, *A Dynamical Model of General Intelligence*

Causal Loop Diagrams

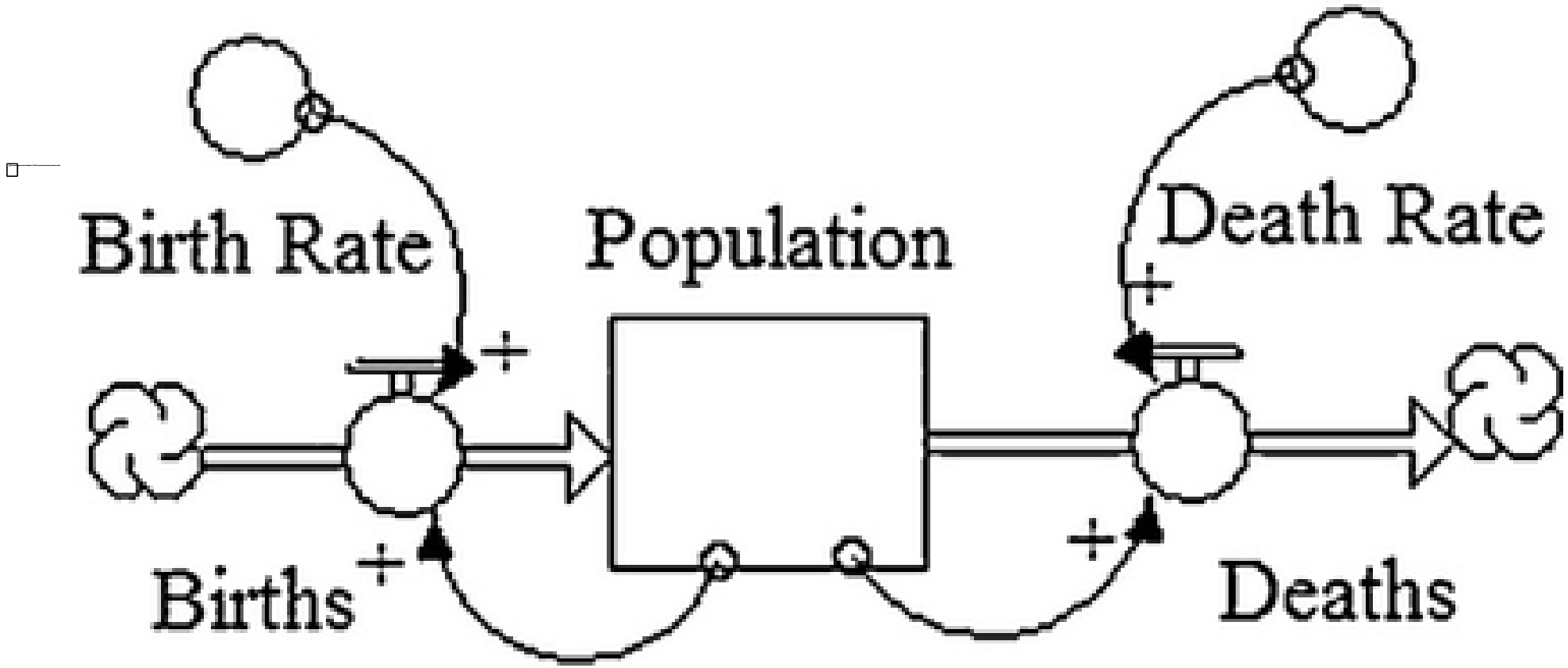


Causal Loop Diagrams

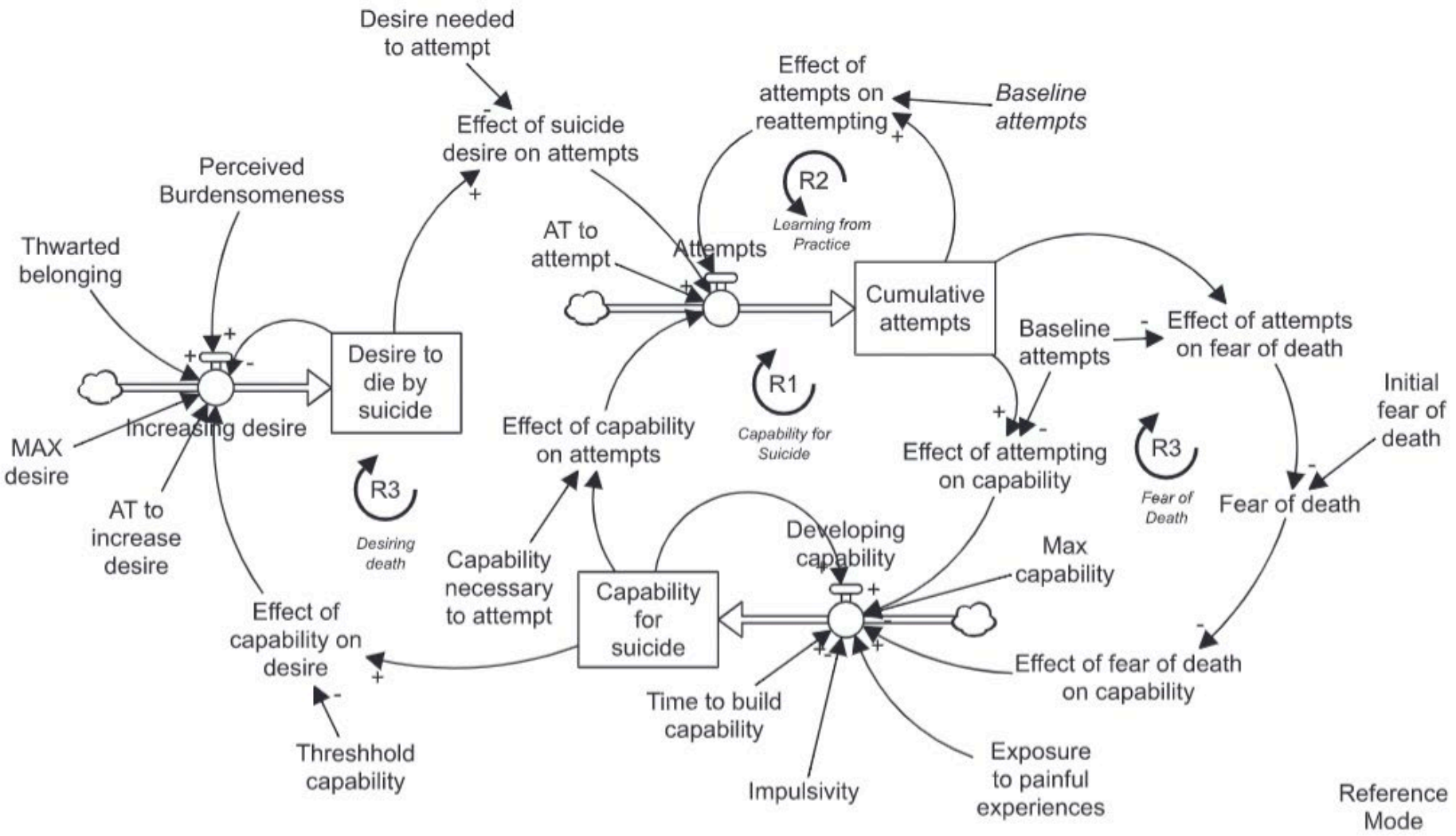


Wittenborn et al., 2016, *Depression as a Systemic Syndrome: Mapping the Feedback Loops of Major Depressive Disorder*

Stock & Flow Diagrams

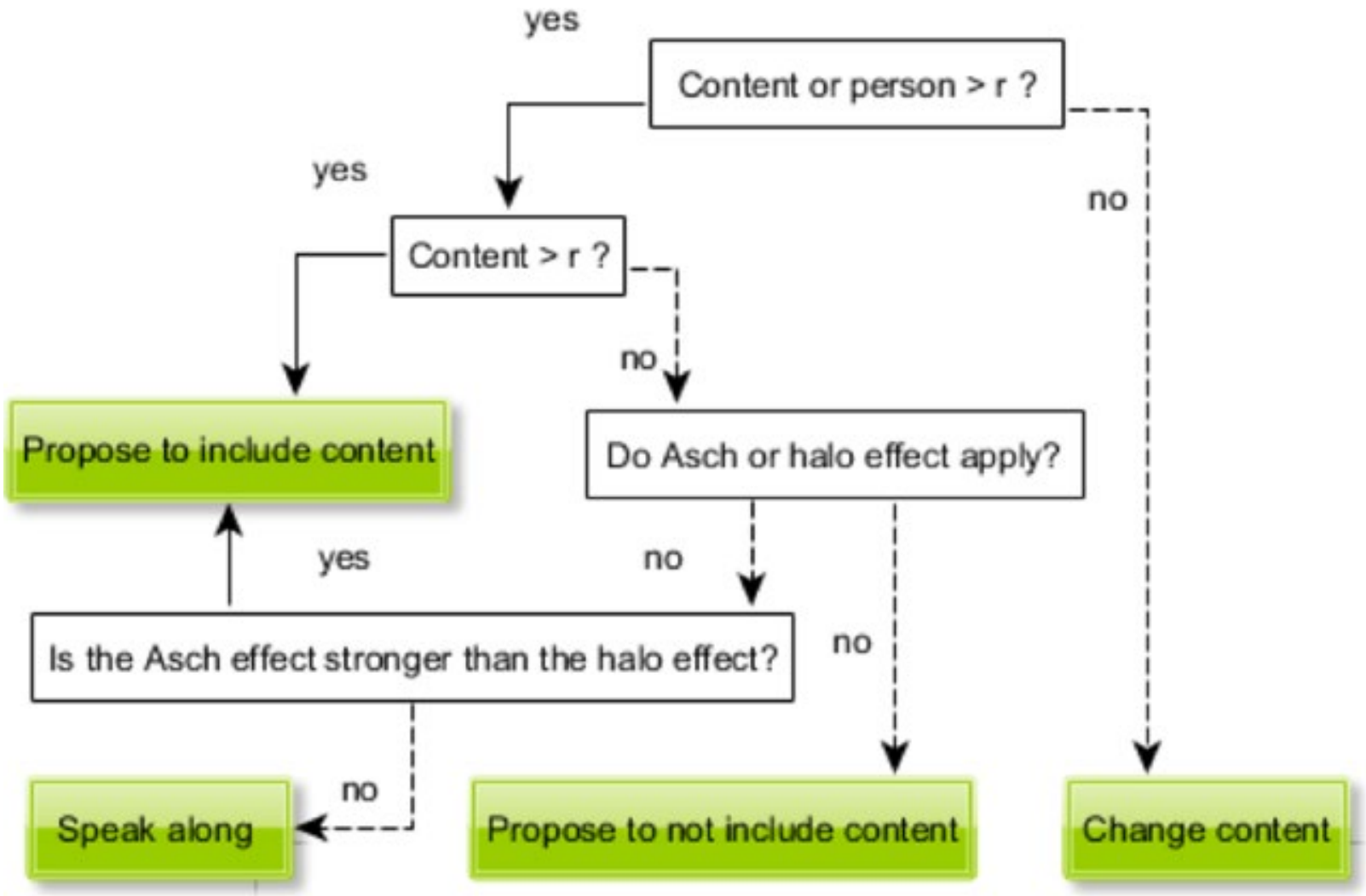


Stock & Flow Diagrams



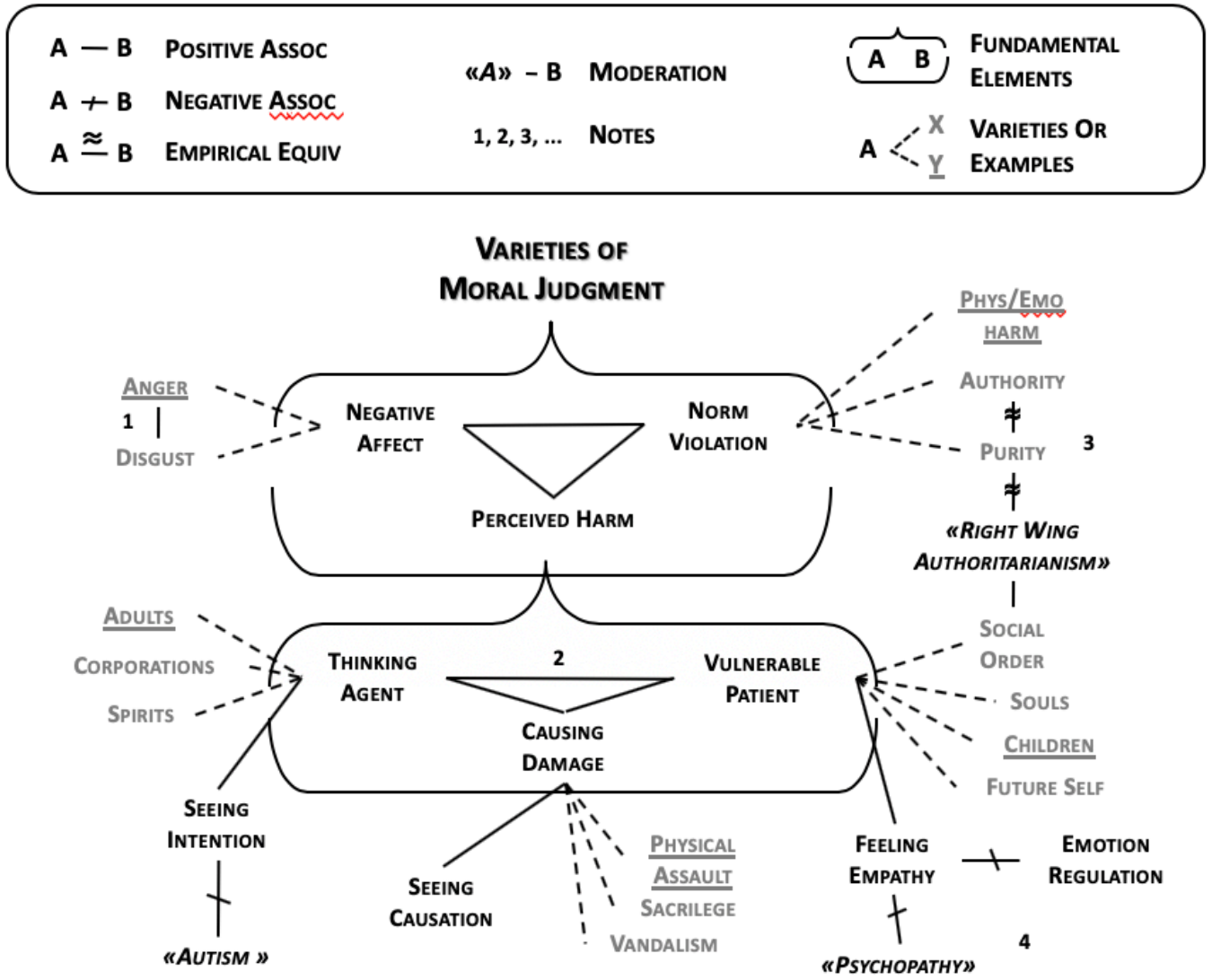
Chung et al., 2022, *Suicide attempts during adolescence: Testing the system dynamics of the interpersonal theory of suicide*

Flowcharts



Eberlen, et al. (2017*). Simulate this! An Introduction to Agent-Based Models and their Power to Improve your Research Practice.*

Theory Maps



Gray, 2017, *How to Map Theory: Reliable Methods Are Fruitless Without Rigorous Theory*

Key Components of a Theory Diagram

A target system (components and relations)

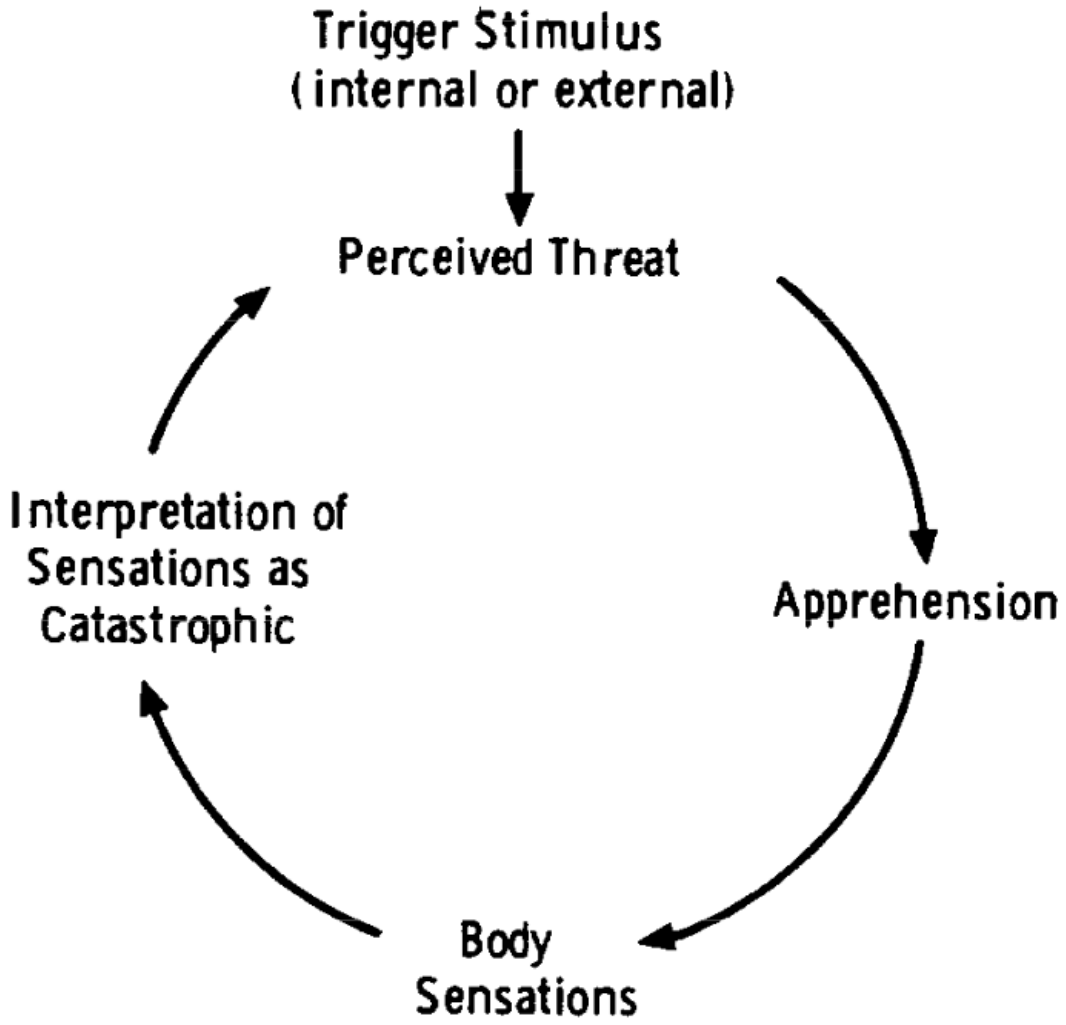
A visual language for describing it

Diagramming a Theory of Panic Disorder

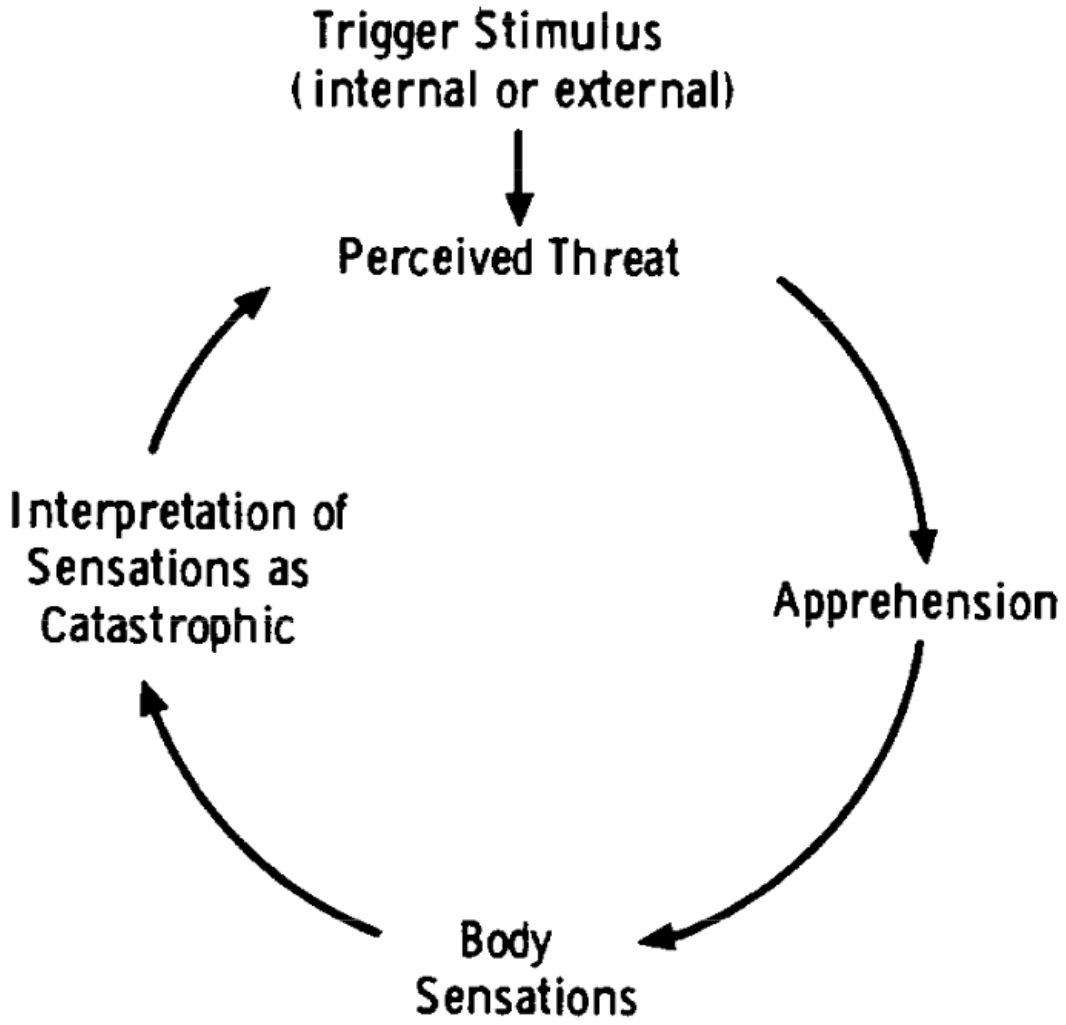
A target system (components and relations)

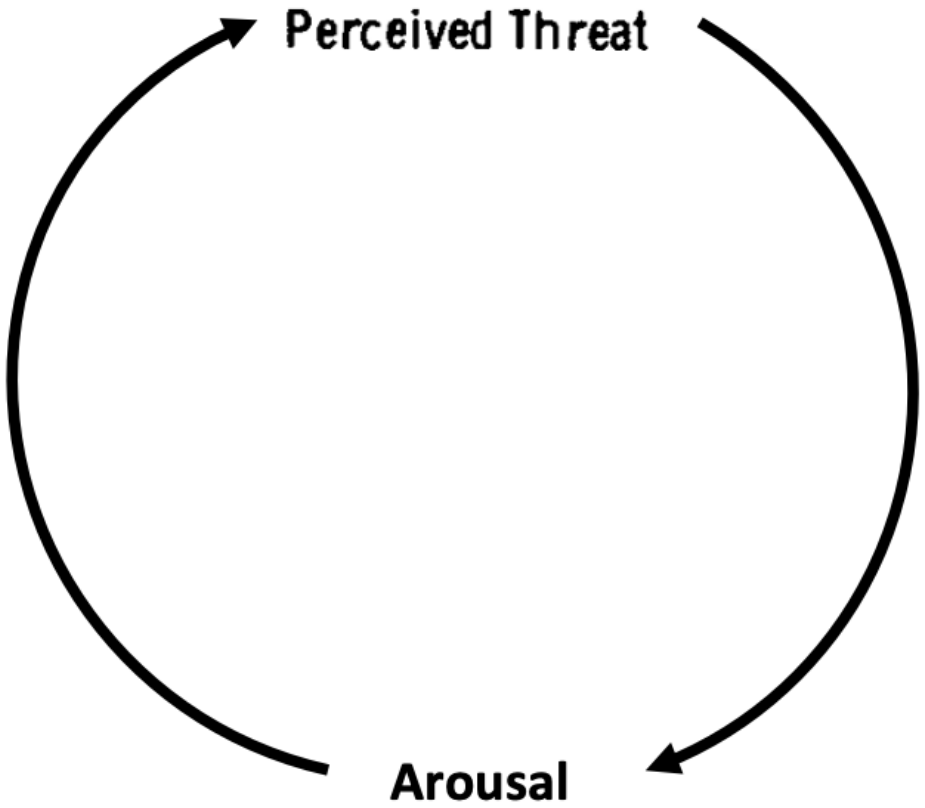
A visual language for describing it

A verbal theory: If a stimulus "is perceived as a threat, a state of mild apprehension results. This state is accompanied by a wide range of bodily sensations. If these anxiety-produced sensations are interpreted in a catastrophic fashion, a further increase in apprehension occurs. This produces a further increase in body sensations and so on around in a vicious circle which culminates in a panic attack."



Clark, 1986, *A Cognitive Approach to Panic*





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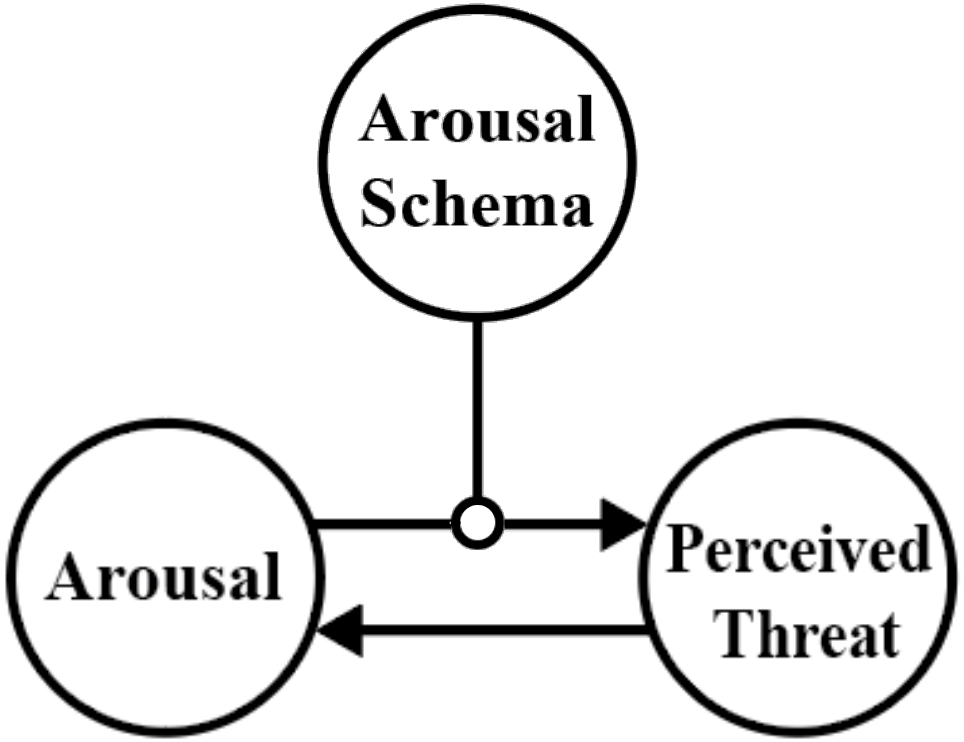
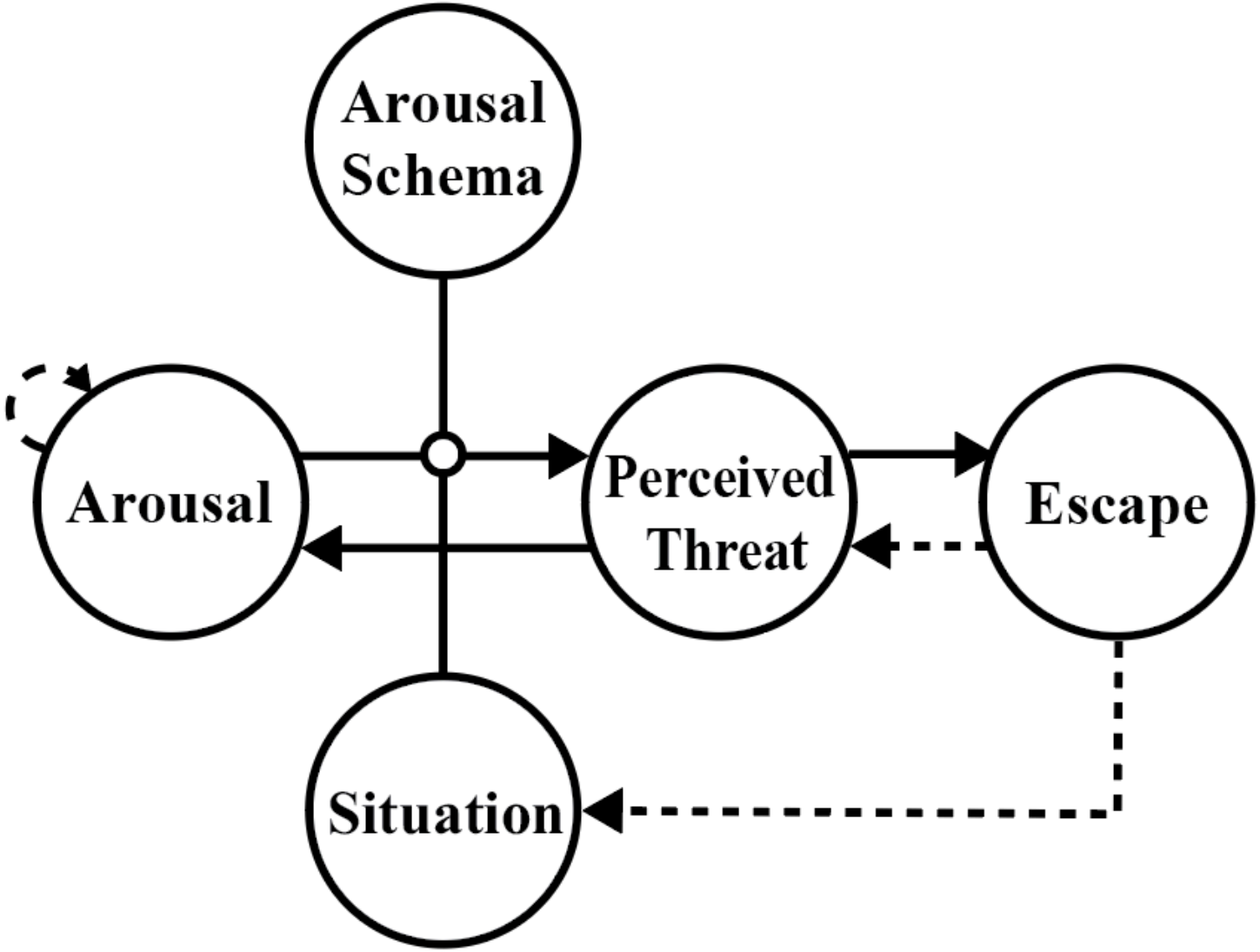
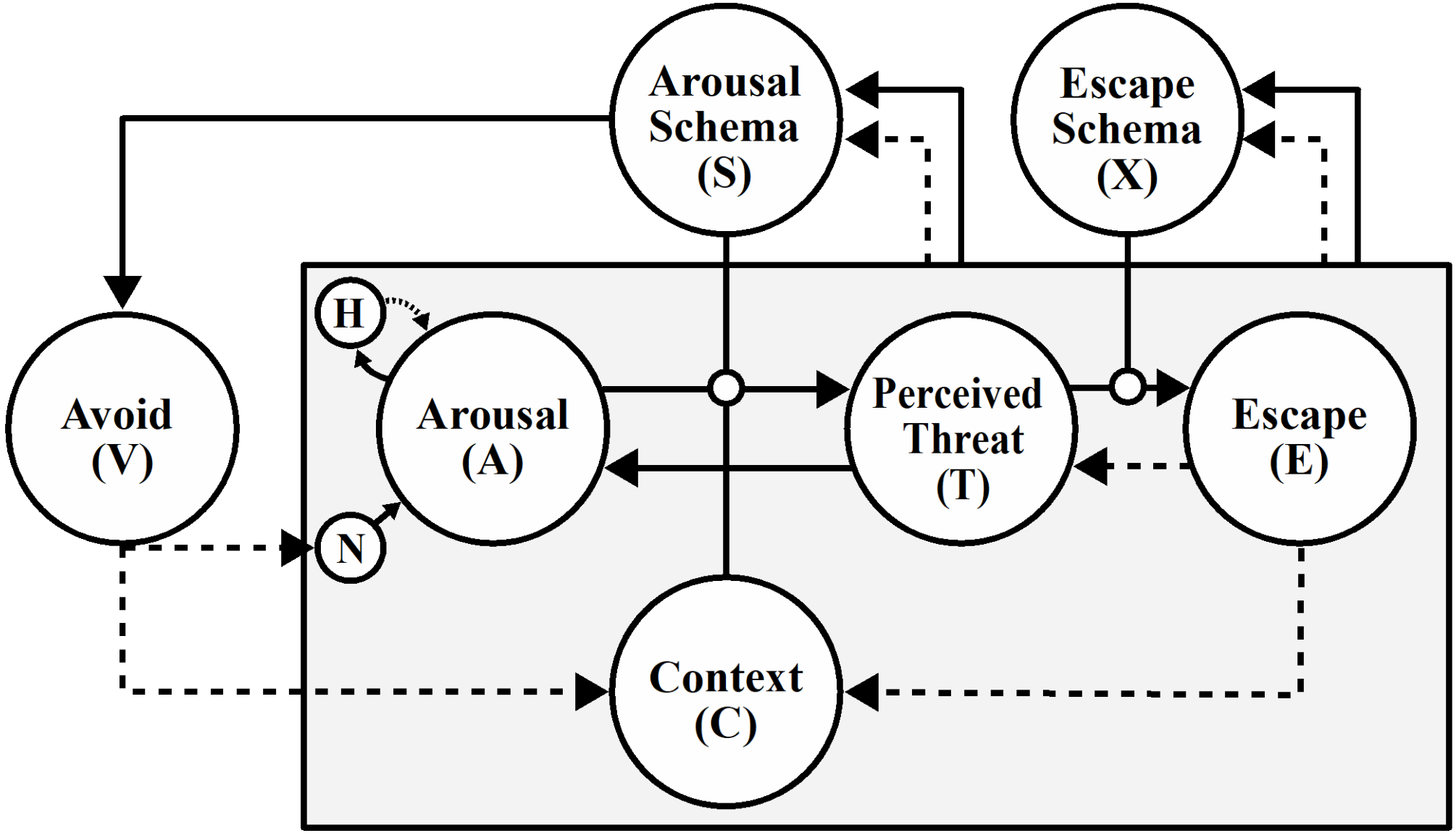


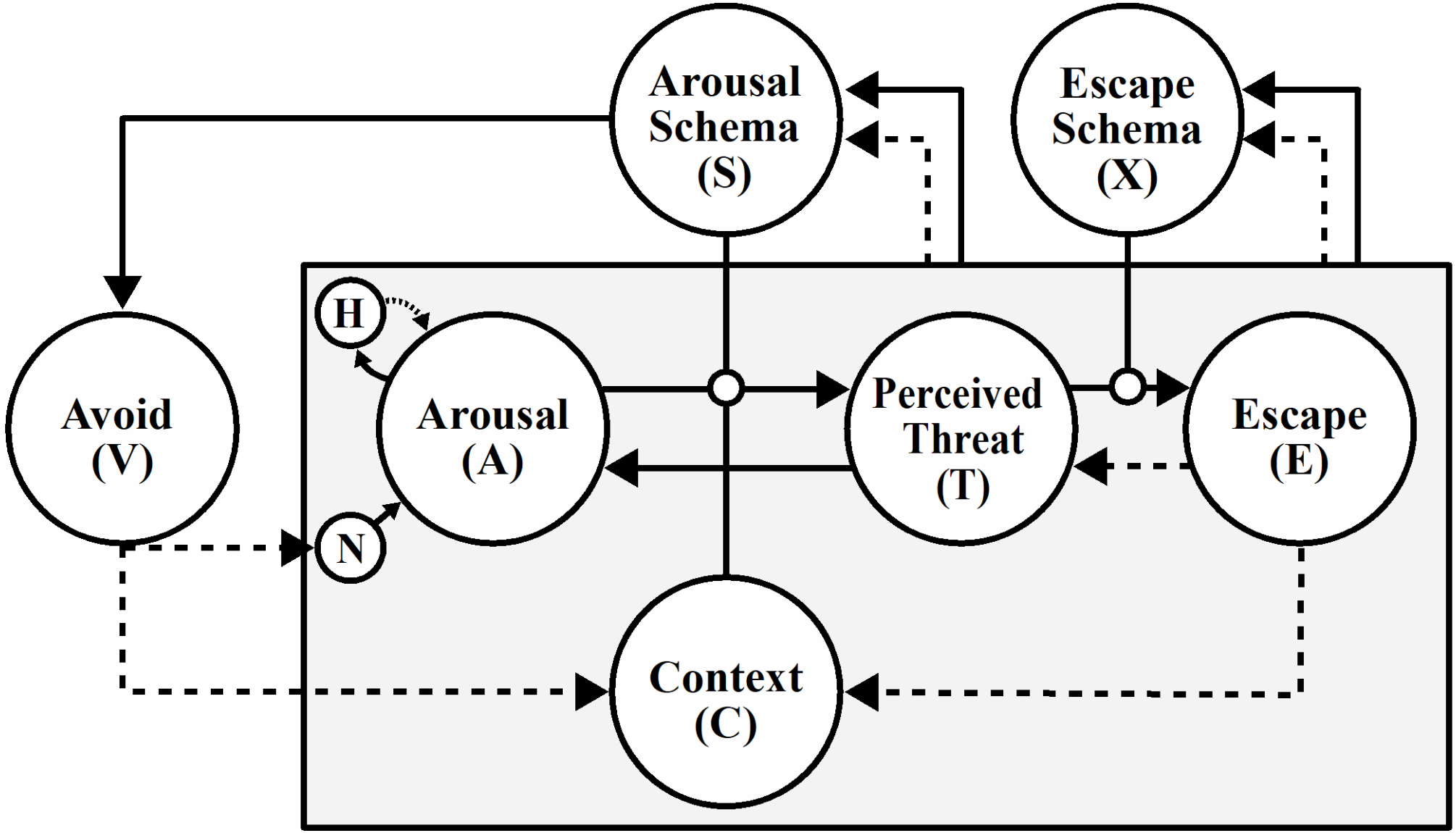
McNally, 2002, *Anxiety Sensitivity and Panic Disorder*



Salkovskis, 1991, *The Importance of Behaviour in the Maintenance of Anxiety and Panic: A Cognitive Account*



Robinaugh et al., 2019, *Advancing the network theory of mental disorders: A computational model of panic disorder*



Robinaugh et al., 2019, *Advancing the network theory of mental disorders: A computational model of panic disorder*

Diagram your theory

What are the components of your target system?

What are the relationships among those components?

Summary

Theories **explain** phenomena.
Theories **represent** target systems.

The first steps to generating a formal theory are to identify phenomena you want to explain and the target system you believe produces those phenomena.

Causal diagrams provide a step toward the specificity needed to formalize the theory.