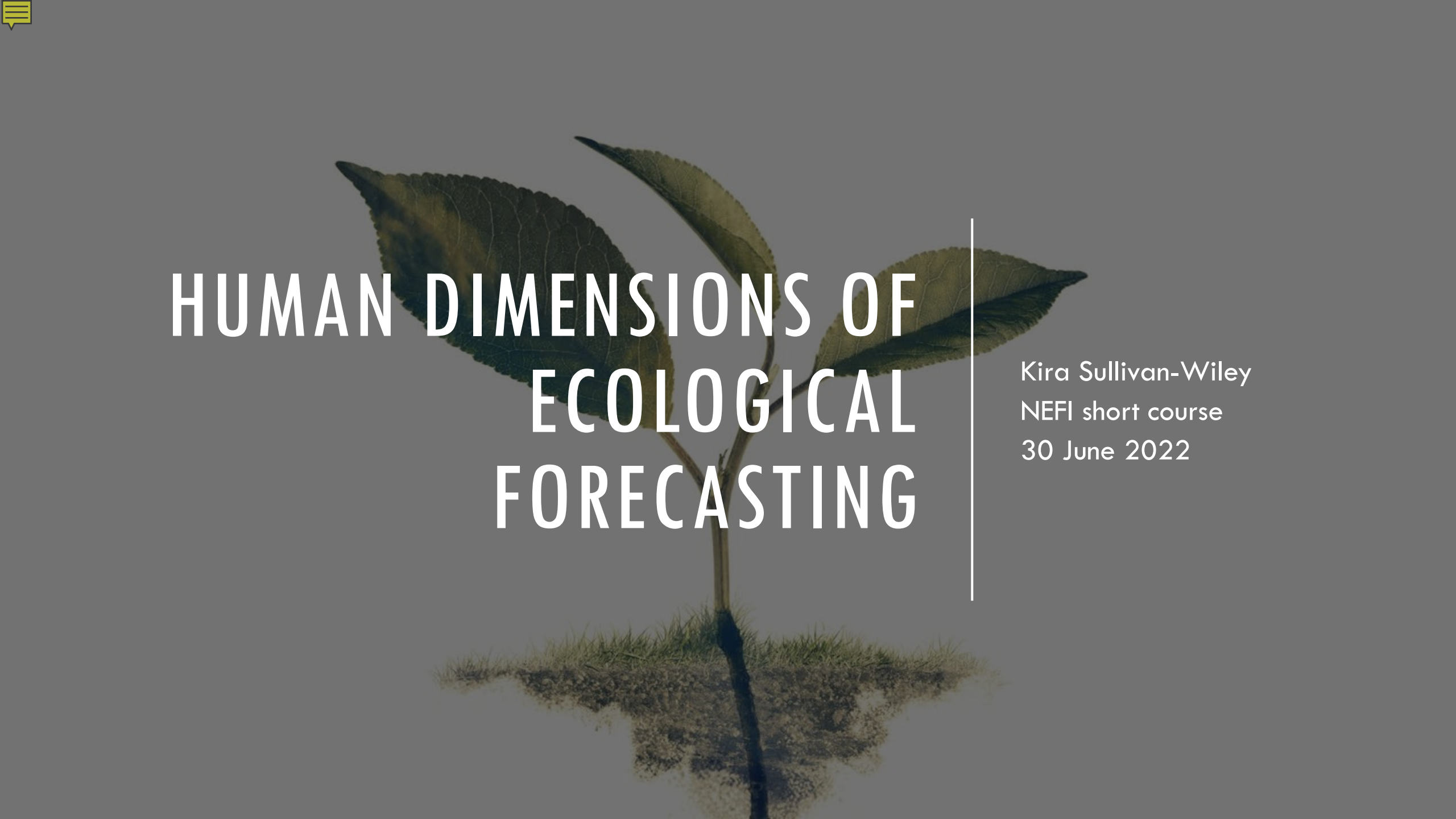
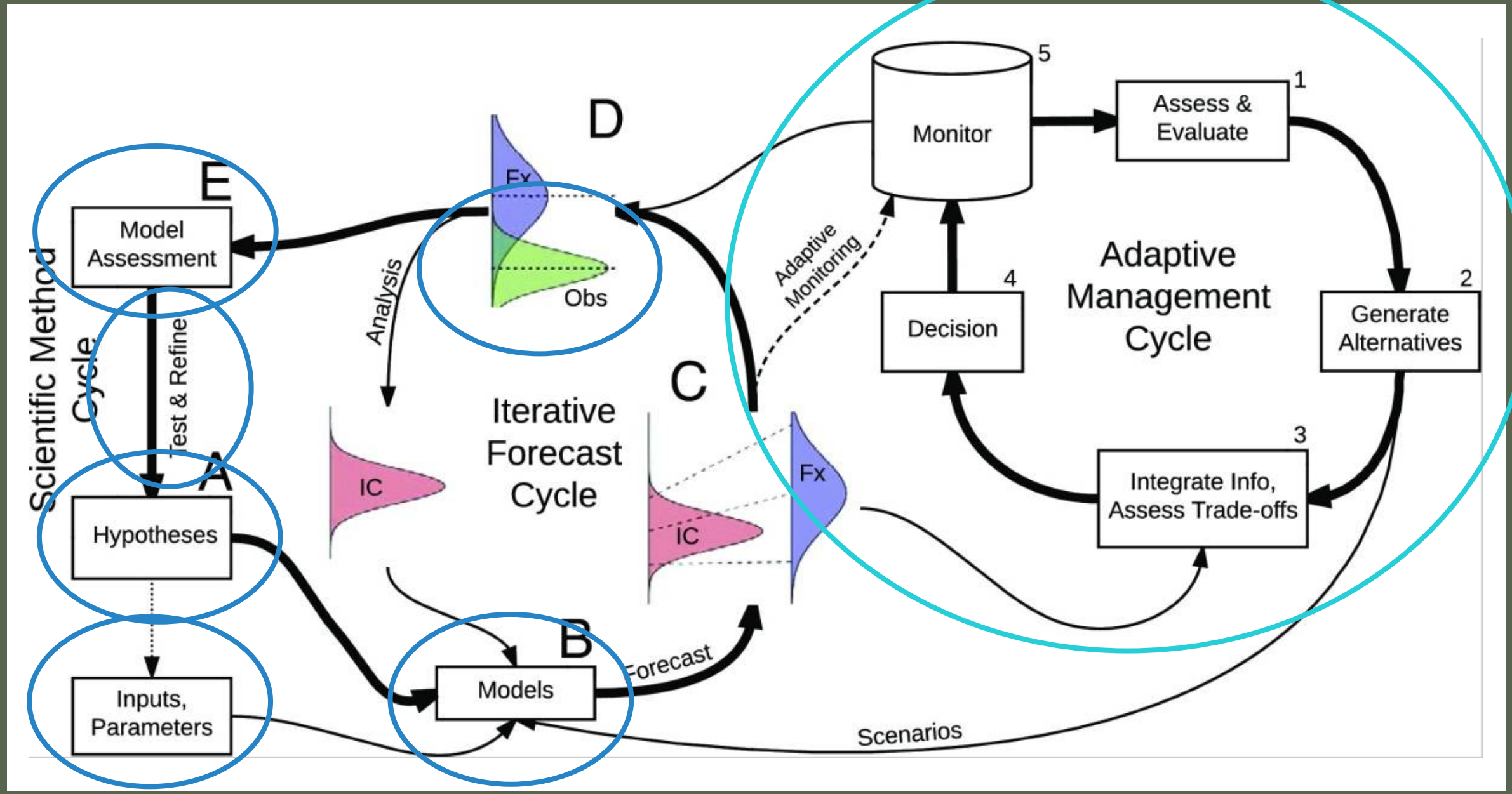


HUMAN DIMENSIONS OF ECOLOGICAL FORECASTING

Kira Sullivan-Wiley

NEFI short course

30 June 2022

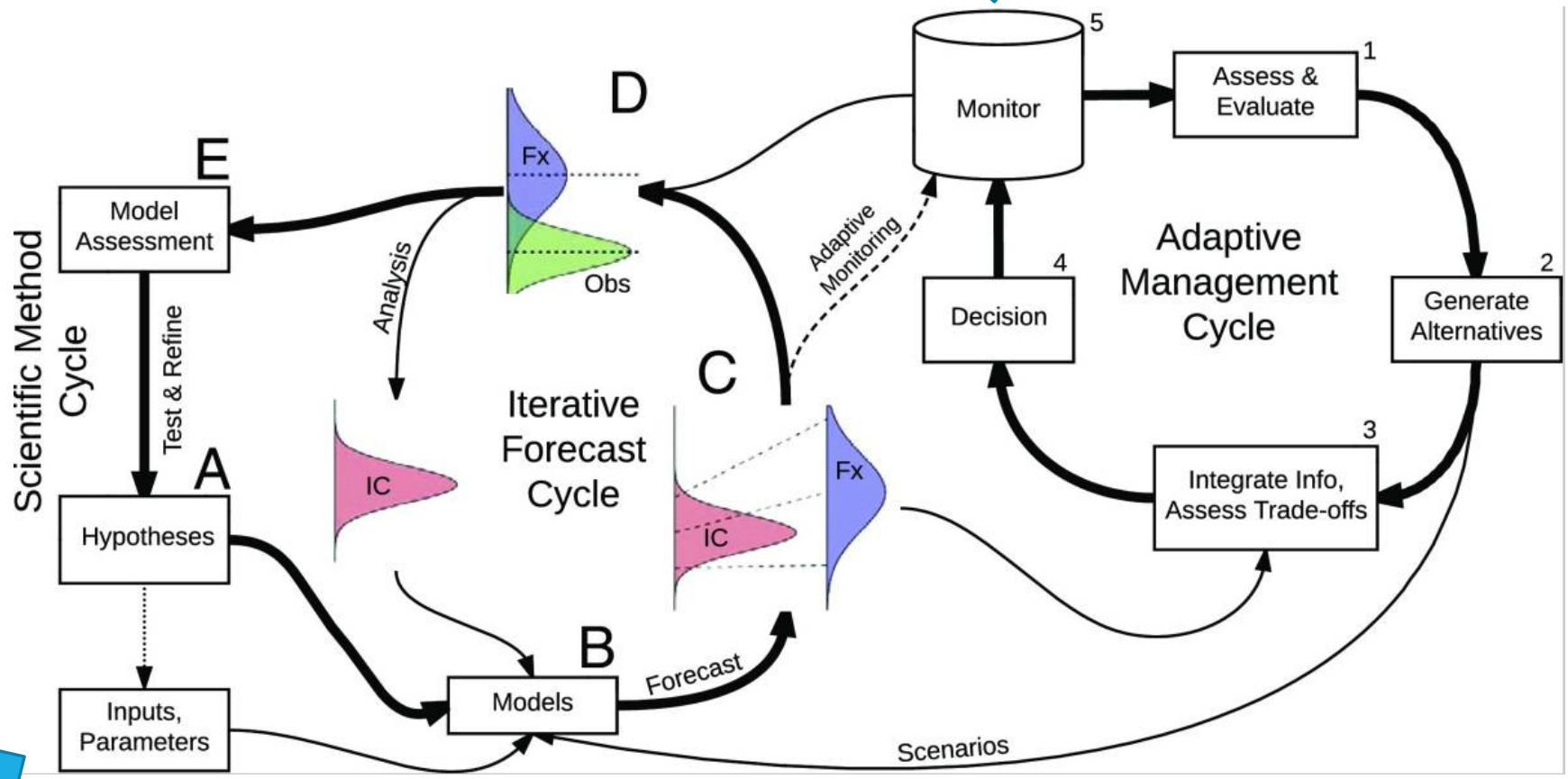

Scientific Method Cycle
E
Model Assessment
Test & Refine
A
Hypotheses
Inputs, Parameters
D
Fx
Obs
Analysis
C
Iterative Forecast Cycle
IC
IC
Fx
B
Models
Forecast
Scenarios
Adaptive Monitoring
5
Monitor
1
Assess & Evaluate
Adaptive Management Cycle
4
Decision
2
Generate Alternatives
3
Integrate Info, Assess Trade-offs

Funders

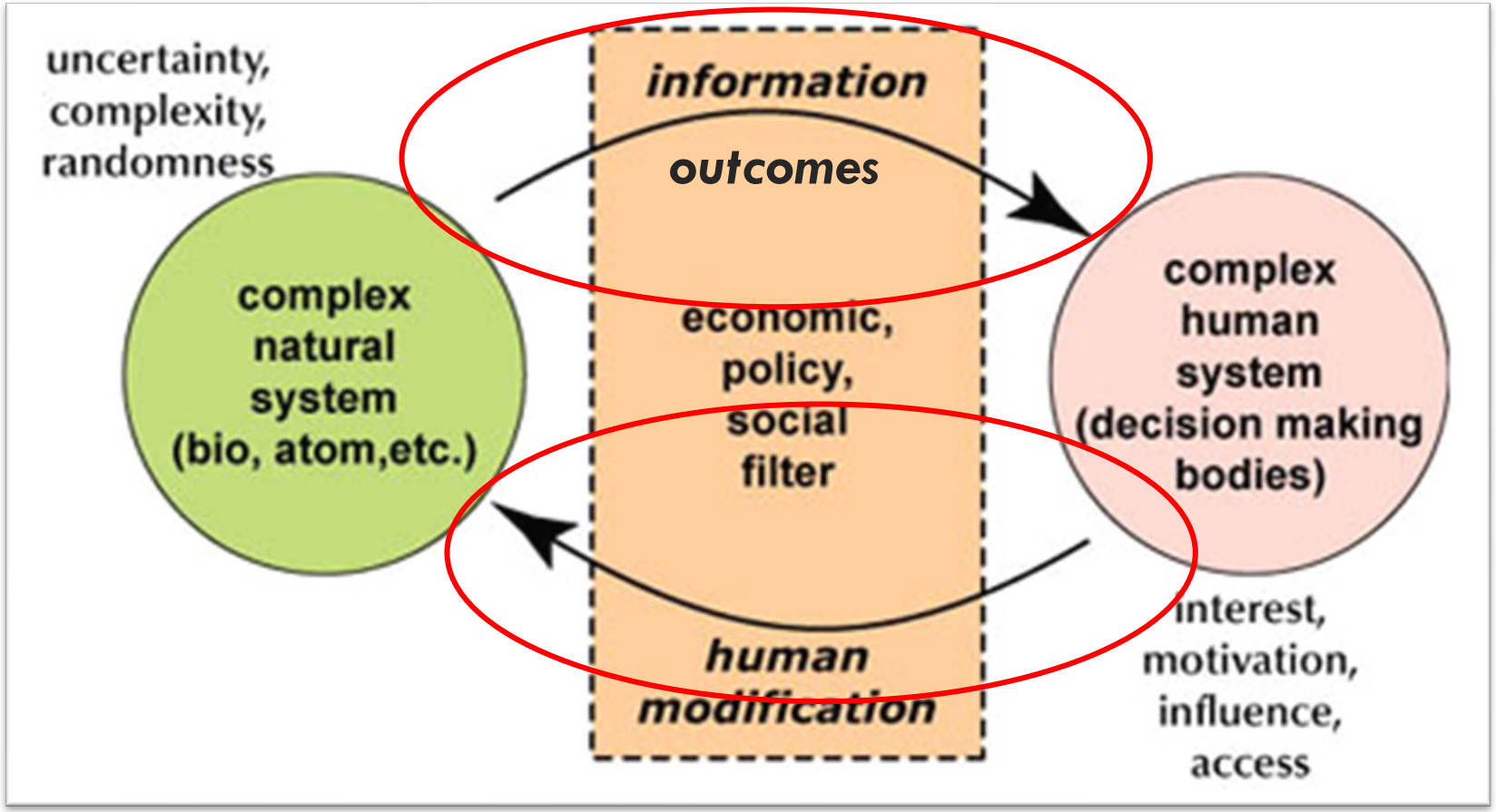
Policymakers

Media

???



ANTHROPOCENE & COUPLED SYSTEMS



Public health

Agriculture

Fisheries

Forests

Water

Tourism/ recreation

Greg Marfleet, Carleton College

UN-STRUCTURED DECISION MAKING

Biases and heuristics

Social decision context

Physical decision context

Risk perception

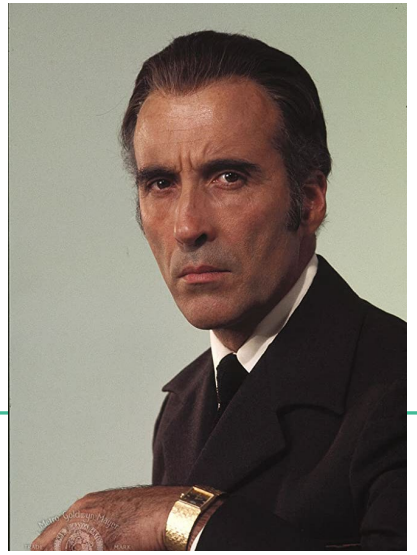
QUESTION

How many films have they been in?

(Note: A-list actors make an average of 1 film per year)

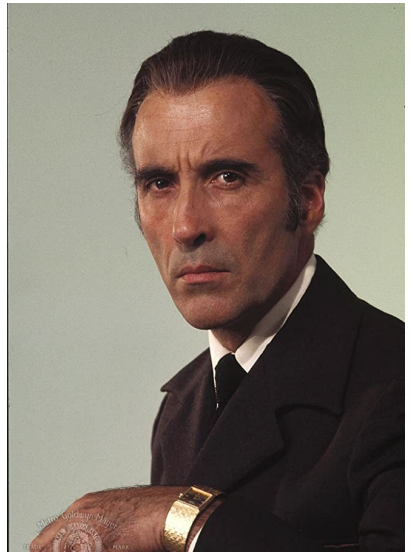
Tom Hanks

Christopher Lee



PREDICTION IN AN UNKNOWN CONTEXT: ANCHORING BIAS

Tom Hanks **84**



Christopher Lee **212**

PREDICTION IN AN UNKNOWN CONTEXT: AVAILABILITY HEURISTIC

- Recent
- Memorable
- Familiar

"Your evaluation is based on the next 30 seconds. Go!"

COMMUNICATING INFORMATION TO INFLUENCE DECISIONS

Loss aversion (ostrich effect)

Finite pools of worry (single action bias)

Discounting bias

Confirmation bias

Further reading: Daniel Kahneman (Thinking Fast and Slow), Amos Tversky, Center for Research on Environmental Decisions (CRED)

QUESTION

A town has two hospitals

Hospital A: 45 babies/day

Hospital B: 15 babies/day

Which will have more days per year where more than 60% of babies born are male?

- ❑ A will have more days
- ❑ B will have more days
- ❑ About the same #

INSENSITIVITY TO SAMPLE SIZE

A town has two hospitals

Hospital A: 45 babies/day

Hospital B: 15 babies/day

Which hospital will log more days per year where more than 60% babies born are male?

- ❑ A will have more days
- ❑ B will have more days
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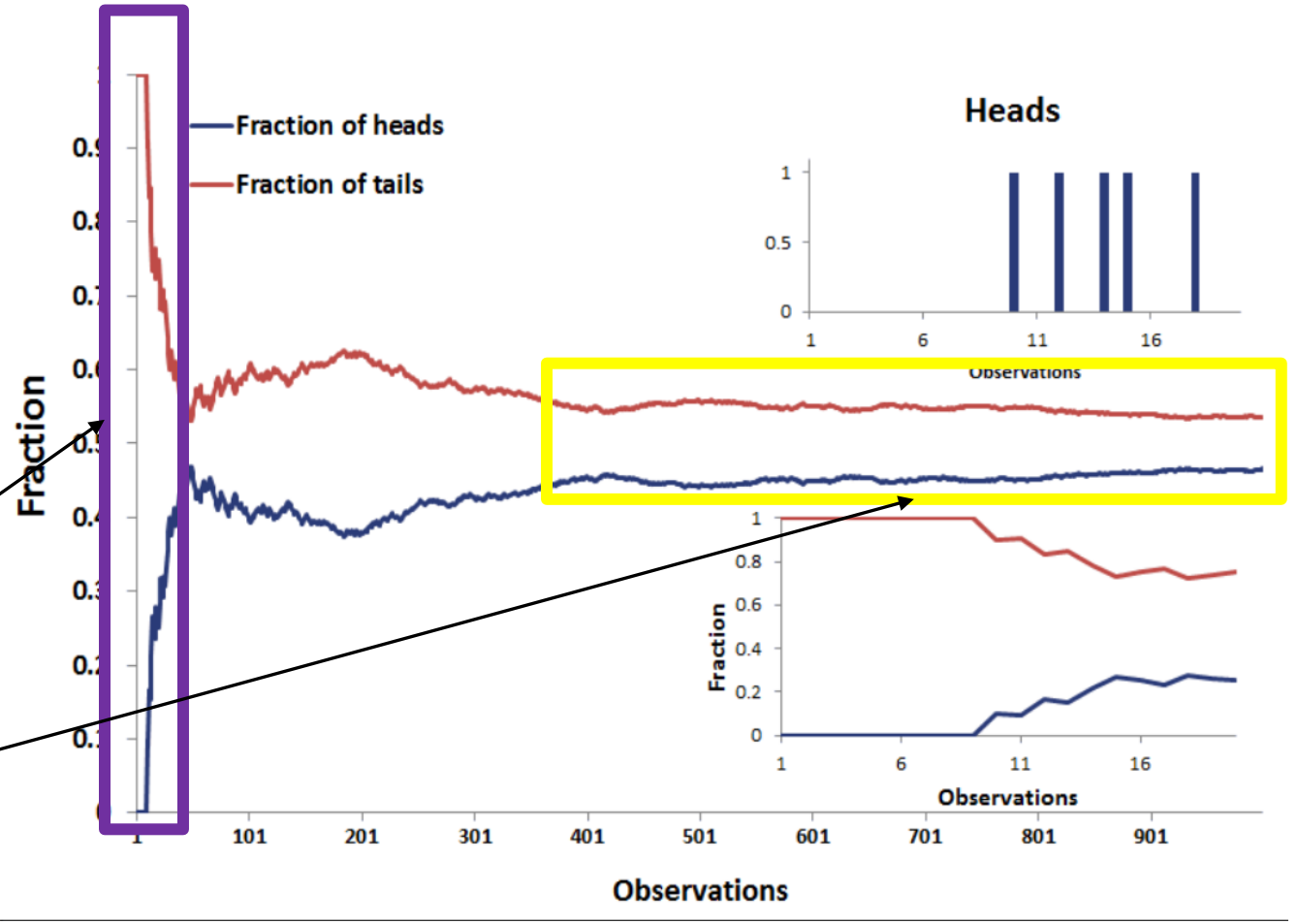
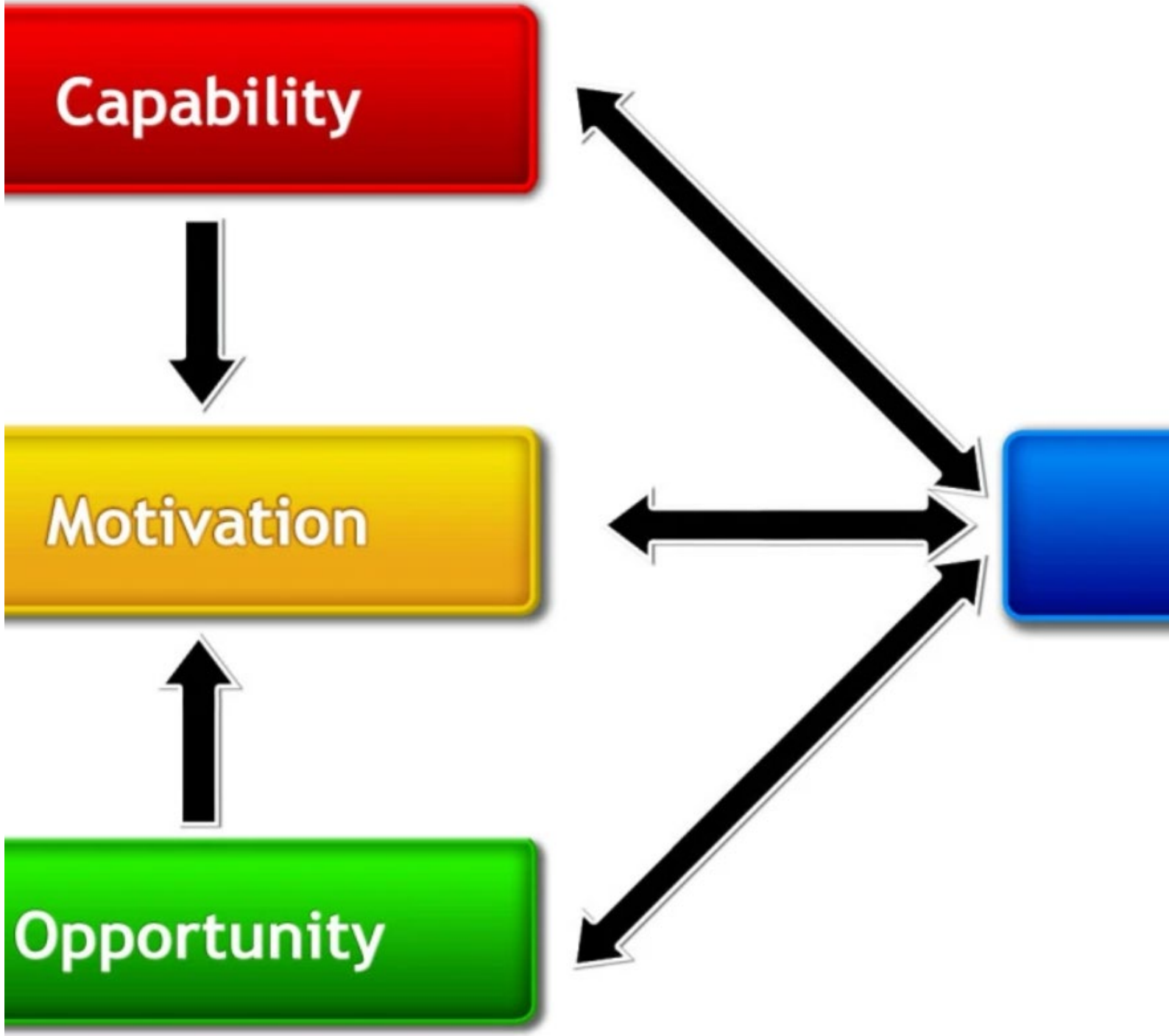


QUESTION

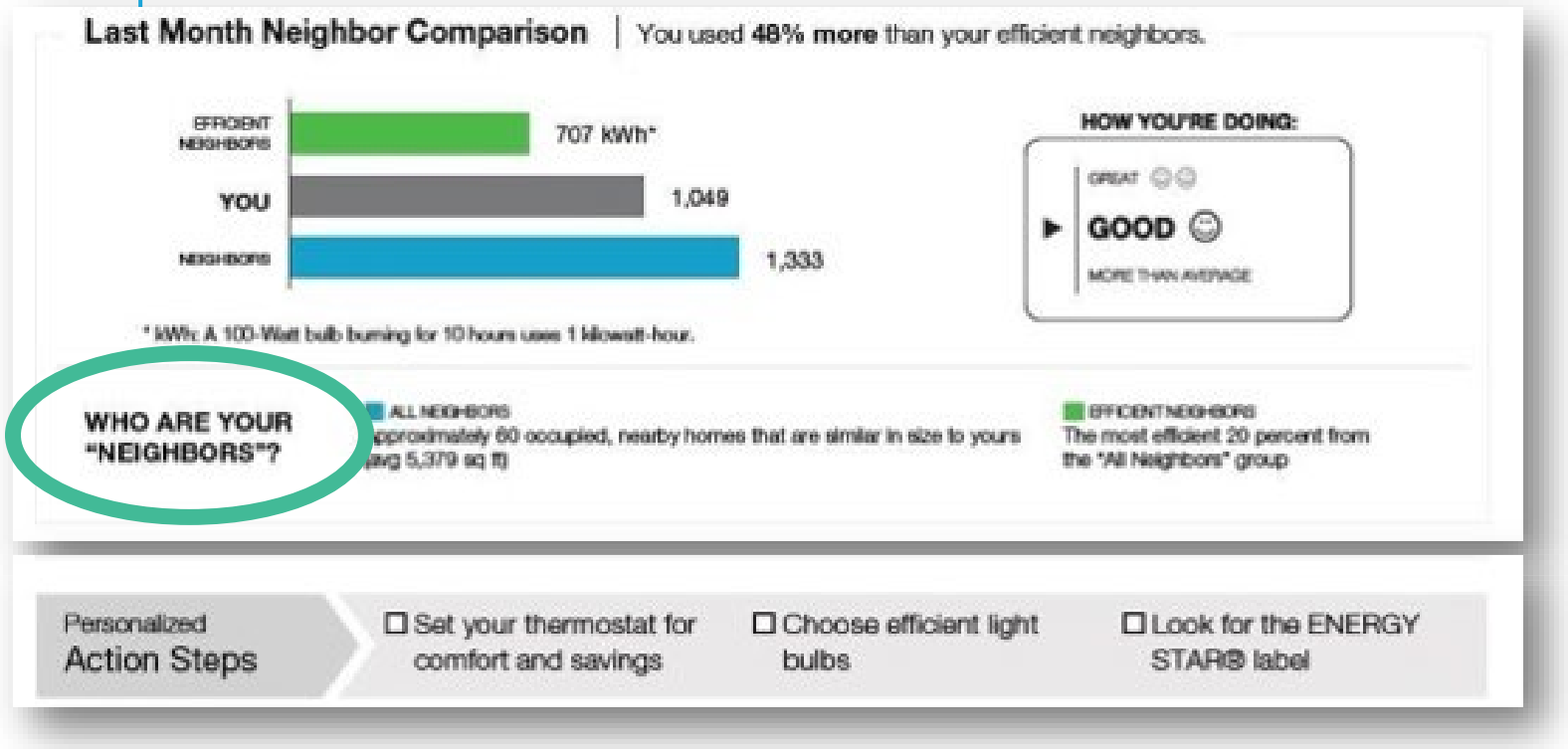
Which of the following are true?

- ❑ People use all prior data in predicting the future.
- ❑ People intuitively understand quantitative concepts like sample size & uncertainty.
- ❑ $1000 has the same value to people, no matter if they are gaining it or losing it.
- ❑ $1000 today is always the same as $1000 in the future.
- ❑ None of these are true. Biases, heuristics, and inconsistencies abound! I should work with a social scientist to understand what they may mean for my work…

BEHAVIOR



SOCIAL NORMS



Empirical expectations

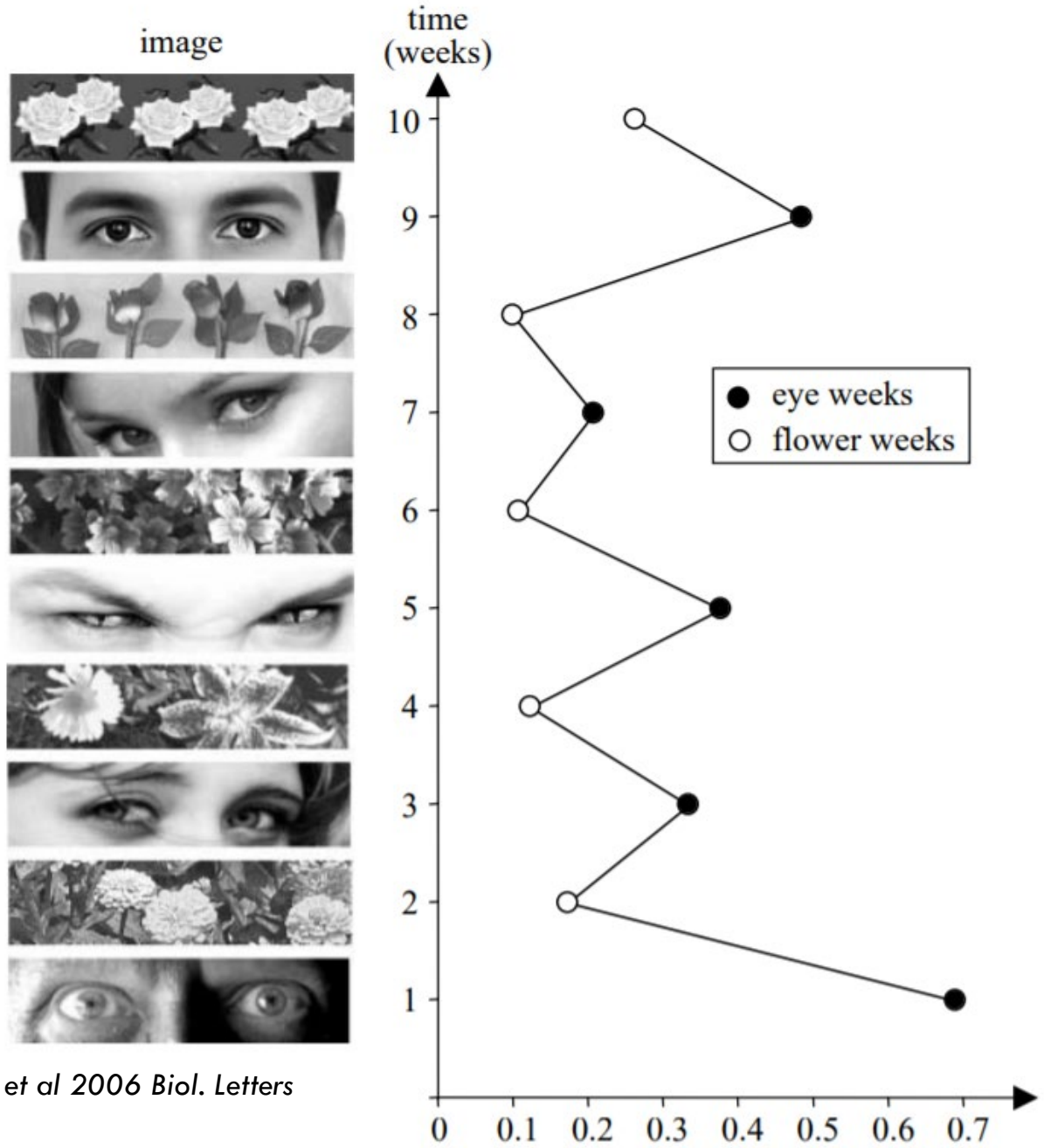
Normative expectations

→Social comparison

→Normative implication

→Reference group

Bicchieri, C. (2017) Norms in the Wild: How to diagnose, measure, and change social norms. Oxford.



Bateson et al 2006 Biol. Letters

SOCIAL CONTEXT OF DECISION MAKING

Observability

Reputation

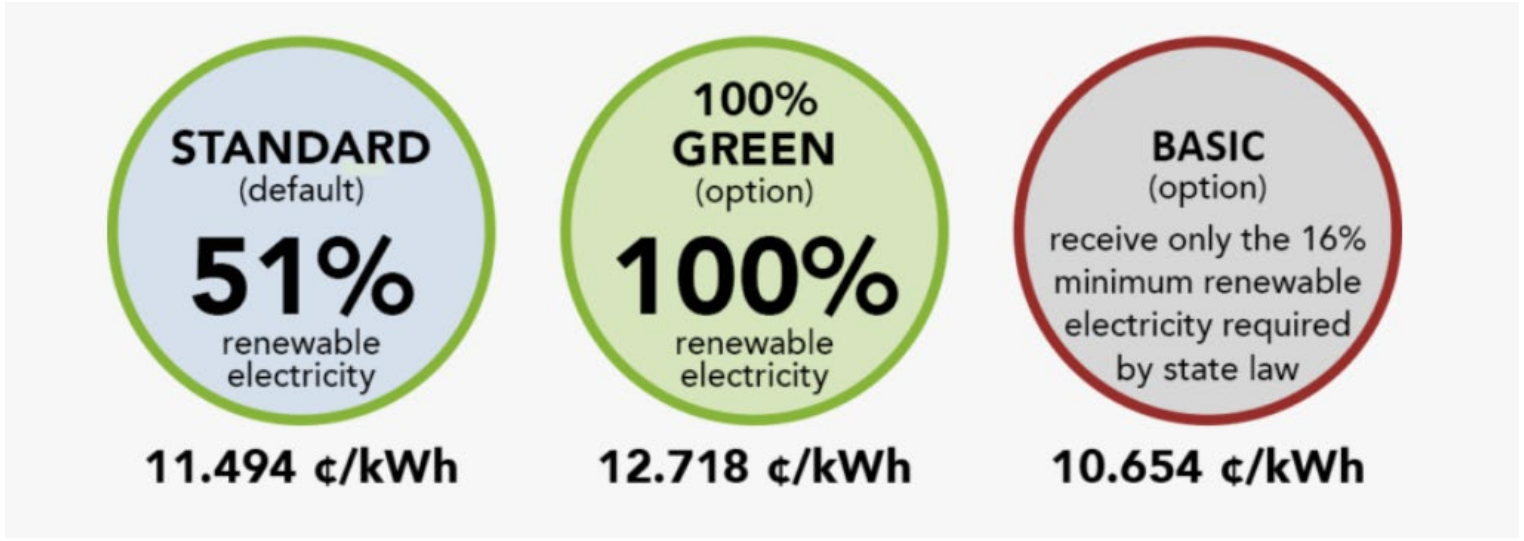
- Identity
- Social position

A SOCIAL NORM IN THE MAKING

PHYSICAL CONTEXT OF DECISION MAKING

Physical reminders

Defaults



QUESTION

Which of the following describes a person adhering to a social norm?

- A man waiting to cross Comm Ave until the signal shows: 
- A woman driving to a central composting site to compost her household food waste.
- A child asking to be excused from the dinner table.

QUESTION

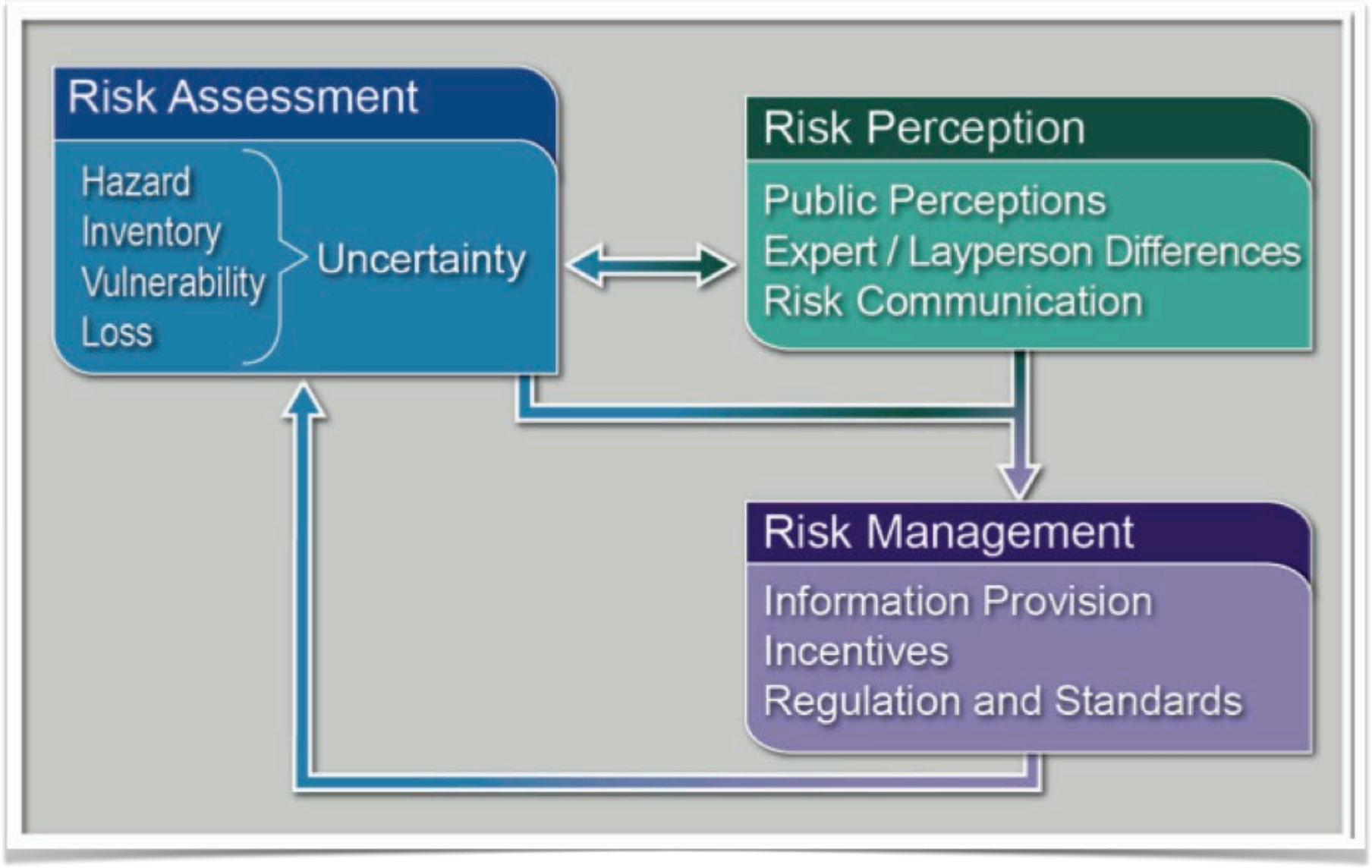
Which of the following describes a person adhering to a social norm?

- ? A man waiting to cross Comm Ave until the signal shows: 
- ? A woman driving to a central composting site to compost her household food waste.
- ☑ A child asking to be excused from the dinner table.

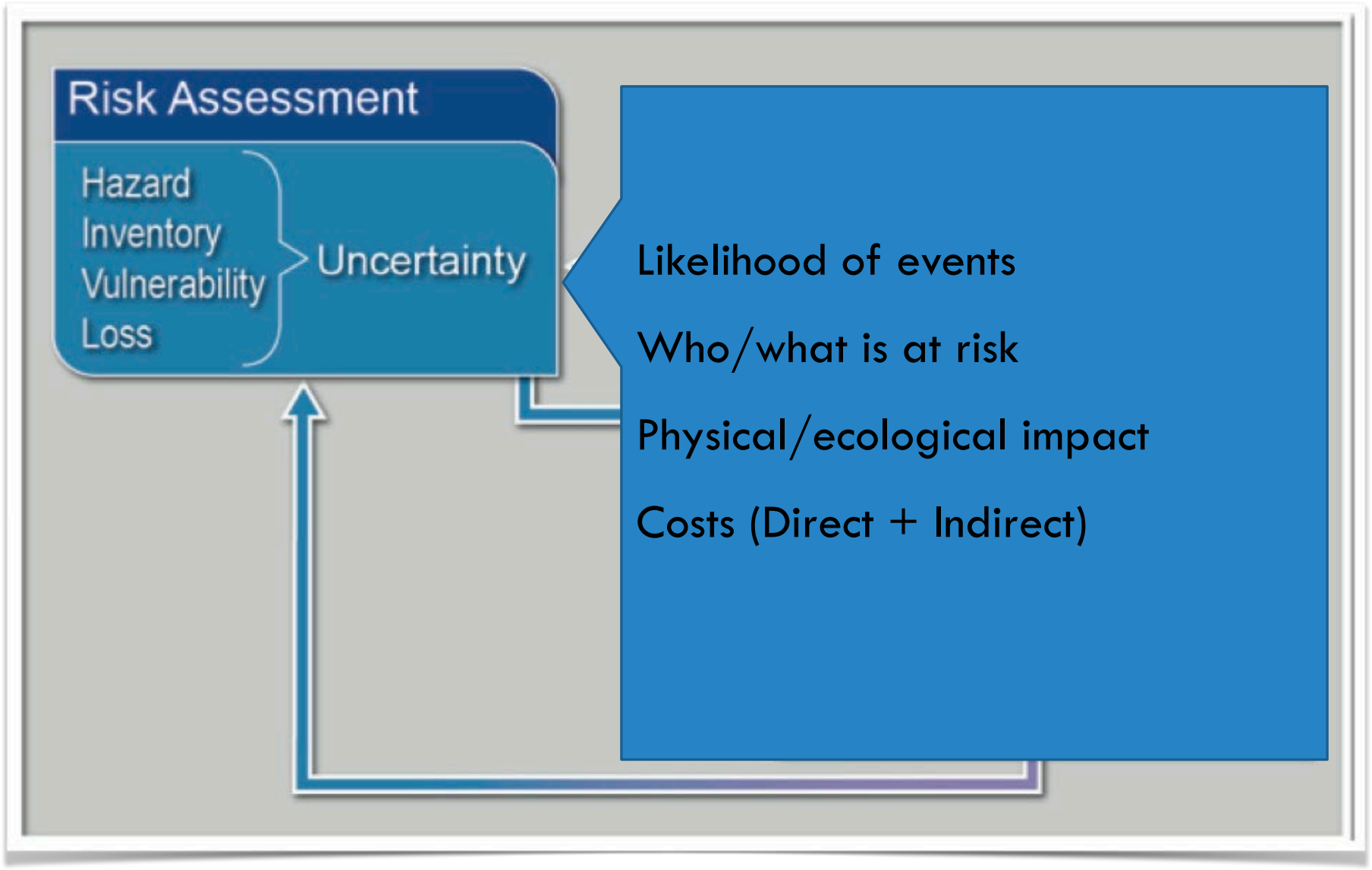
Empirical expectations?

Observability?

RISK

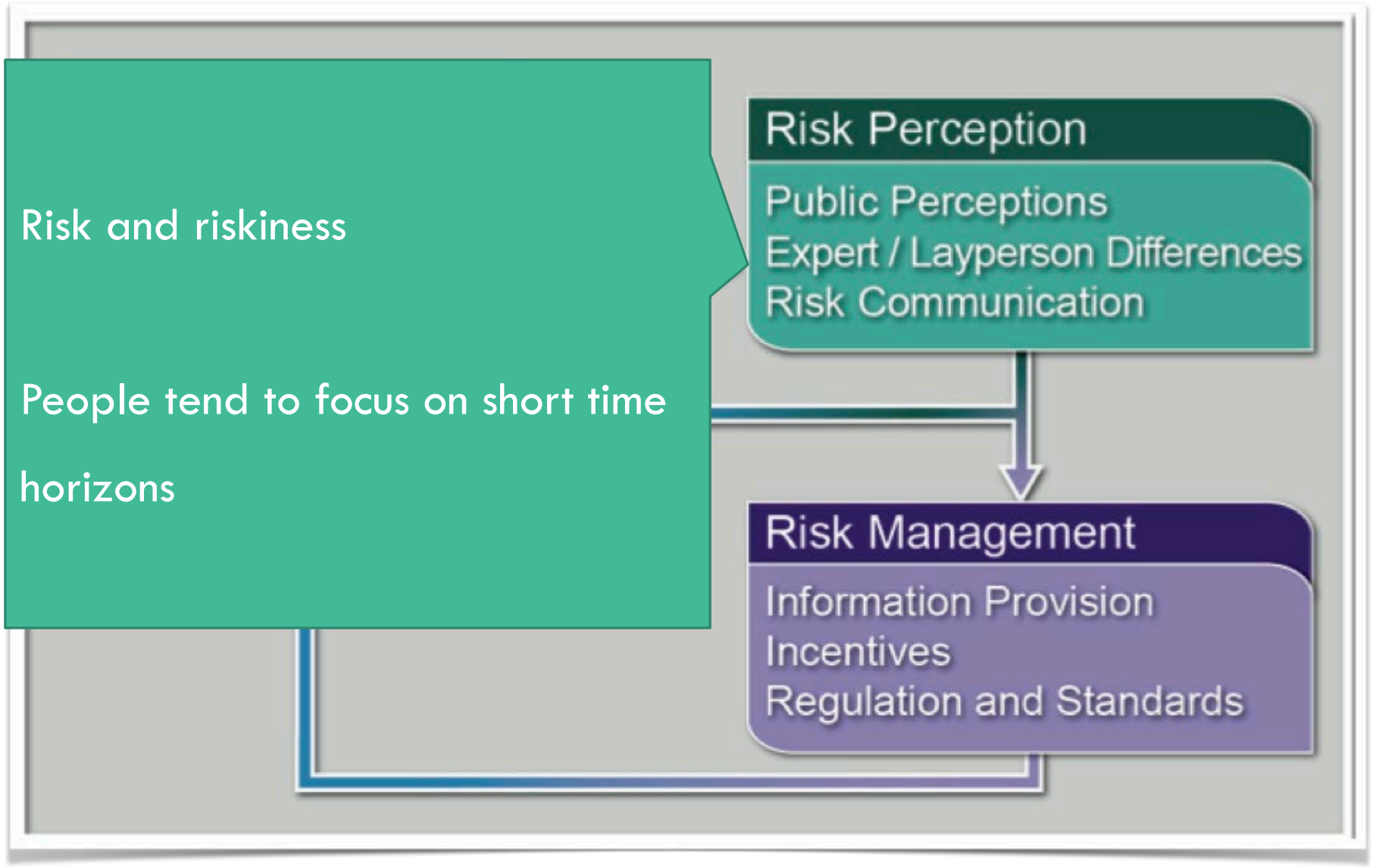


ASSESSING, PERCEIVING, AND MANAGING RISK


Risk Assessment
Hazard
Inventory
Vulnerability
Loss
Uncertainty
Likelihood of events
Who/what is at risk
Physical/ecological impact
Costs (Direct + Indirect)

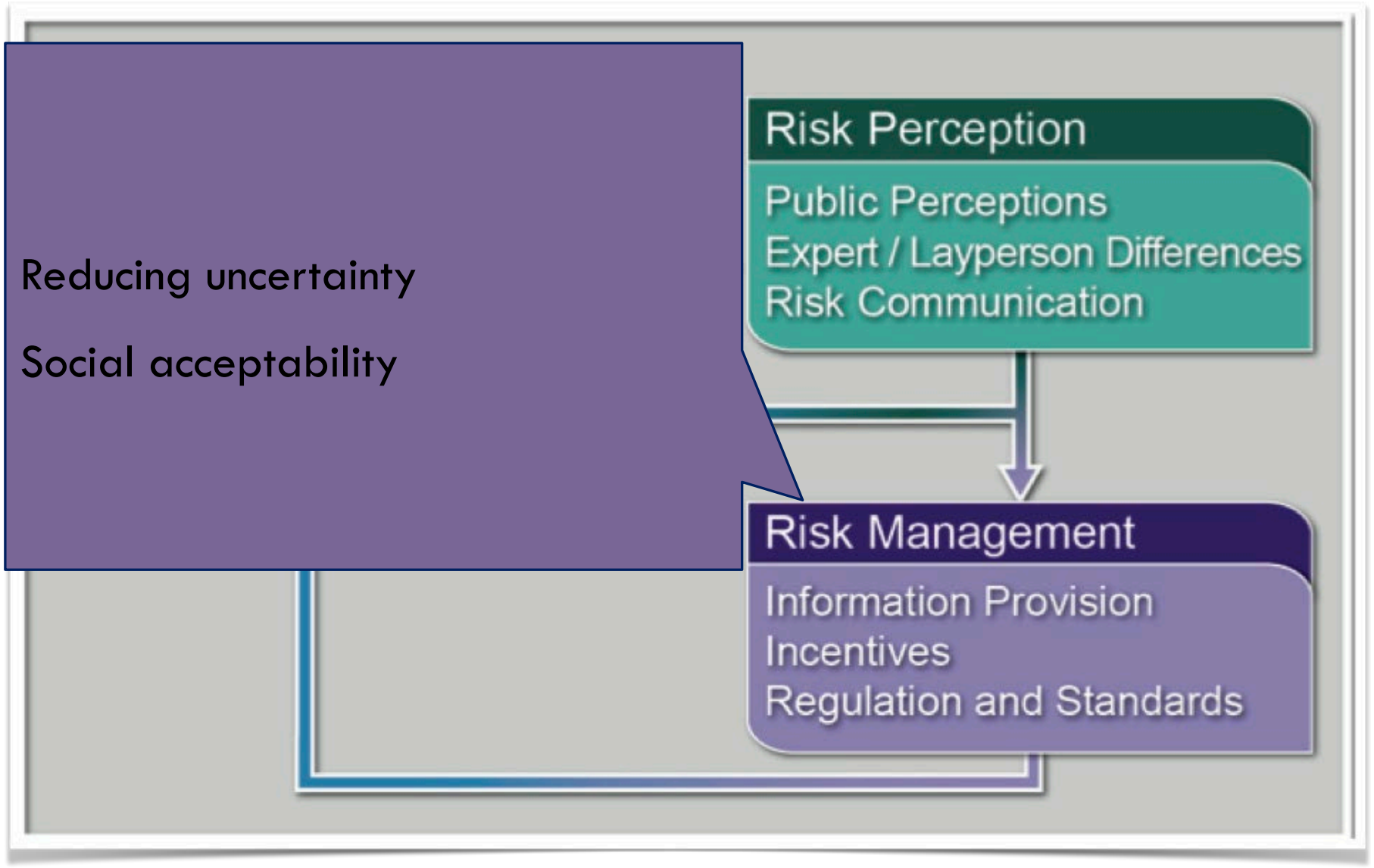
Risk and riskiness

People tend to focus on short time horizons

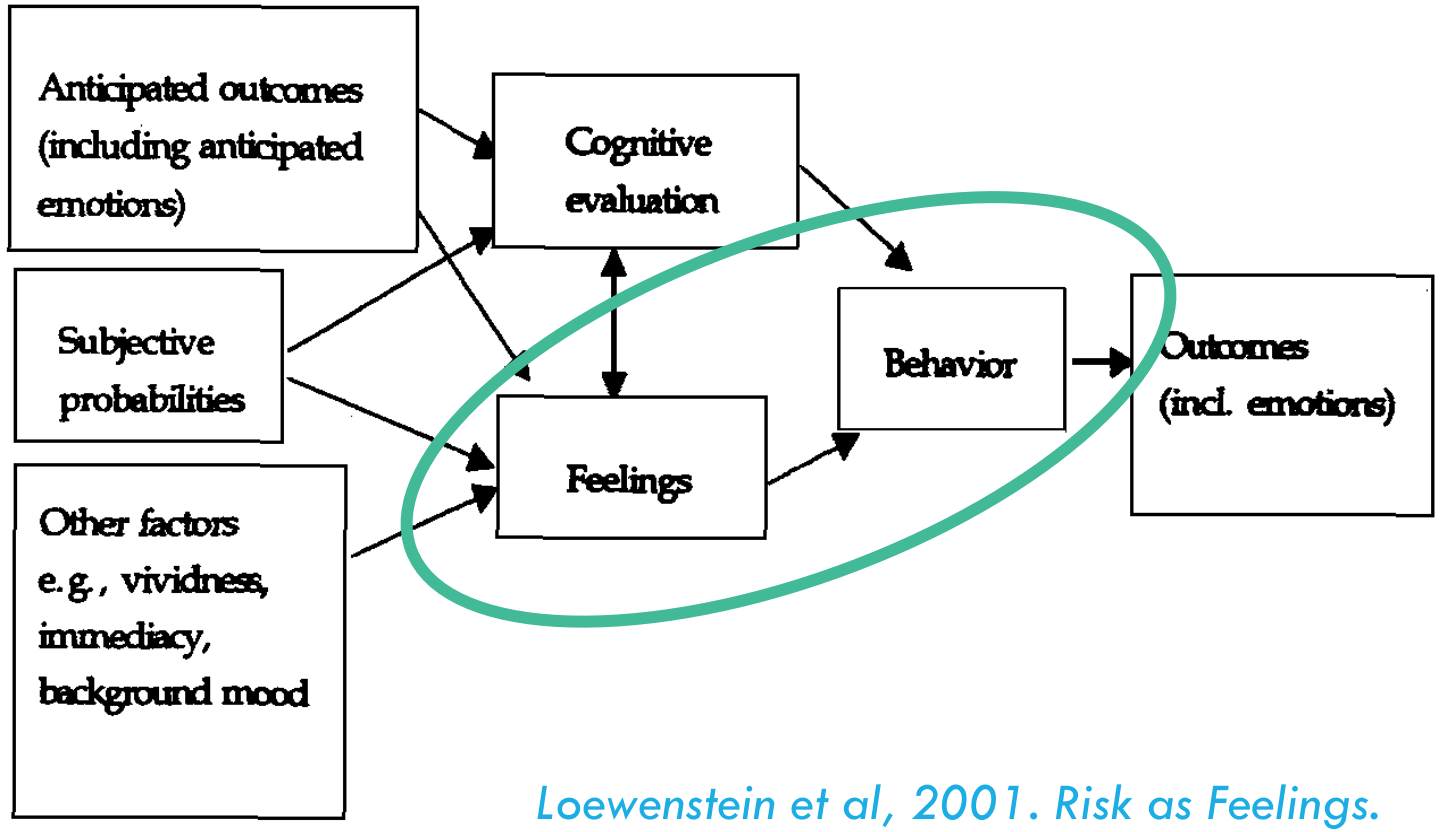


Reducing uncertainty

Social acceptability



ACCEPTABILITY



Loewenstein et al, 2001. Risk as Feelings.

Acceptability of risk

- Benefits
- Affect heuristic
- Responsibility and control

UN-STRUCTURED DECISION MAKING

Biases and heuristics

Social decision context

Physical decision context

Risk perception

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Ecological Forecasting Initiative

BU The Frederick S. Pardee Center for the Study of the Longer-Range Future