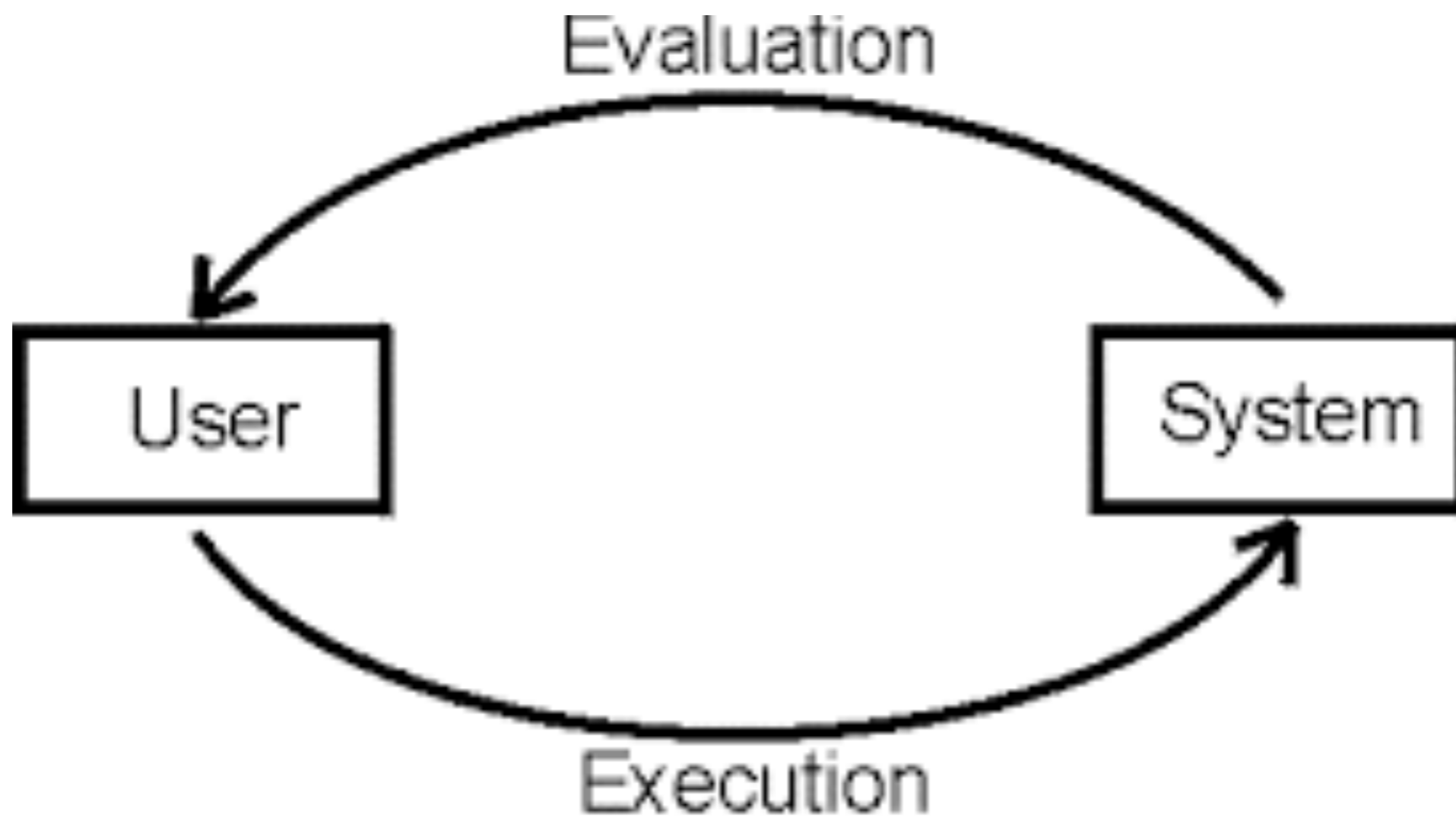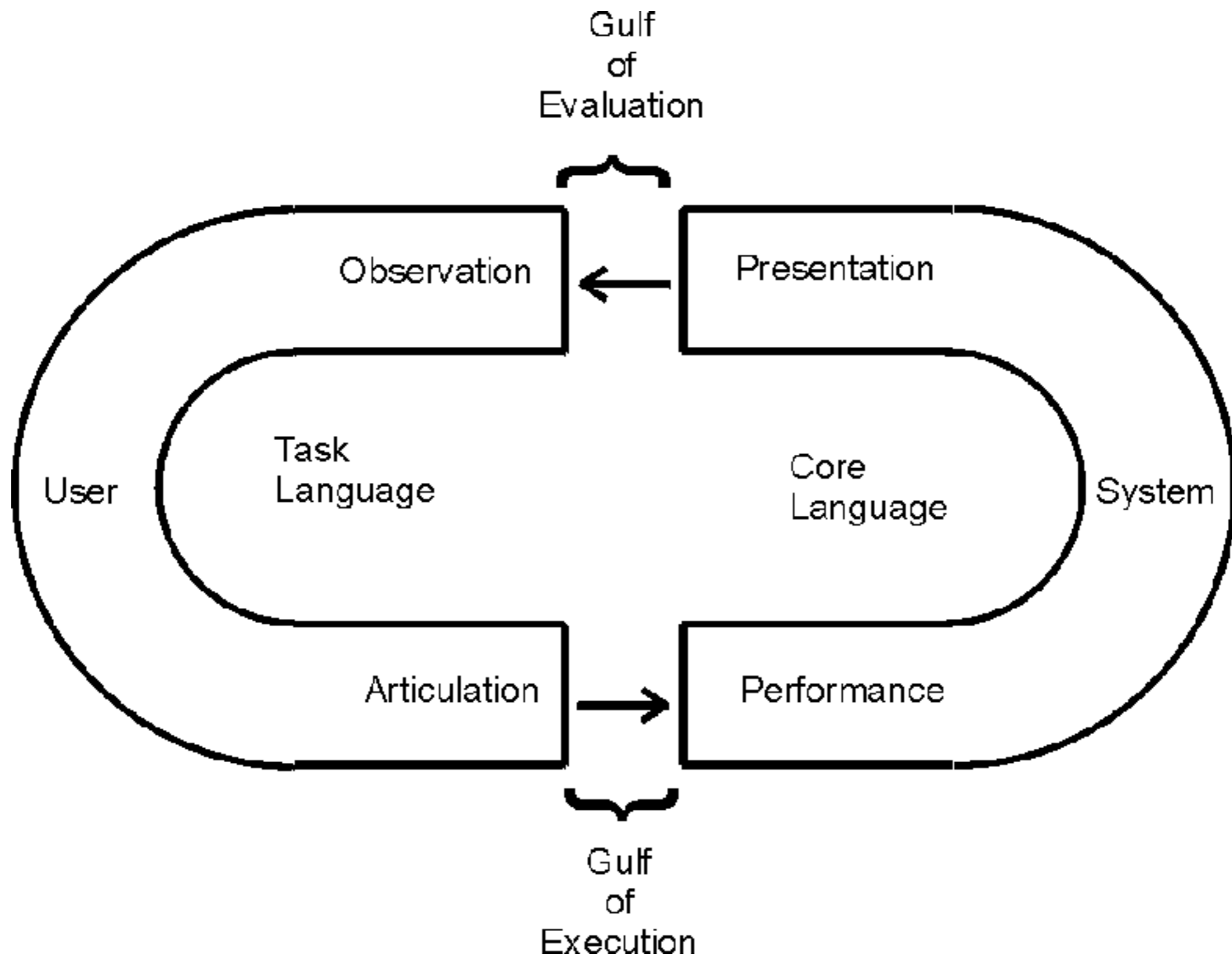# Human-Emotion Interaction is a complex system

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van Berkel et al., 2021. "Modeling interaction as a complex system", Human-Computer Interaction, 36(4): 279-305

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CHI 2022 Workshop:
The Future of Emotion in Human-Computer Interaction

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Norman's Interaction Cycle

Gulf
of
Evaluation

Observation ← Presentation

User   Task   Core   System
        Language   Language
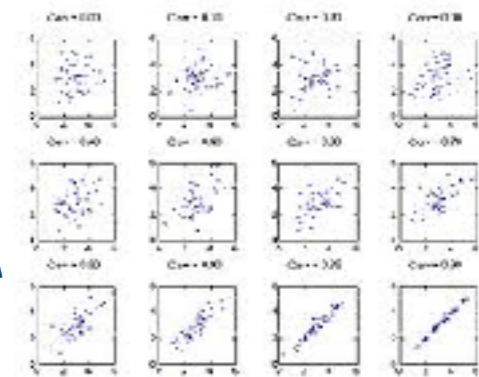
Articulation → Performance

Gulf
of
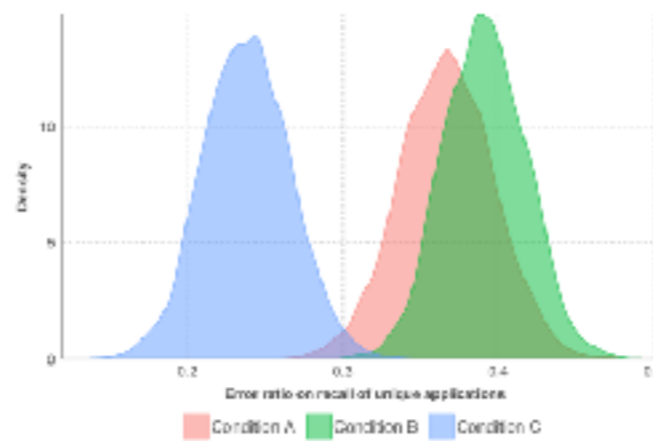Execution

Measurement

Phenomena

Sample data

Analysis/Statistics

Assumption: causal relationships

So far: 3 approaches

- Controlled studies
  - the researcher intervenes in the reality of participants
- Observational studies
  - the researcher does not intervene in the reality of the participants
  - models use regressions
- Qualitative methods
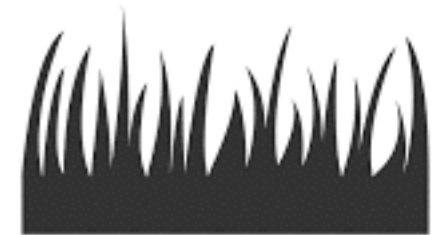 - descriptions of activities & experiences to understand dynamic interactions => Hypothesis generation
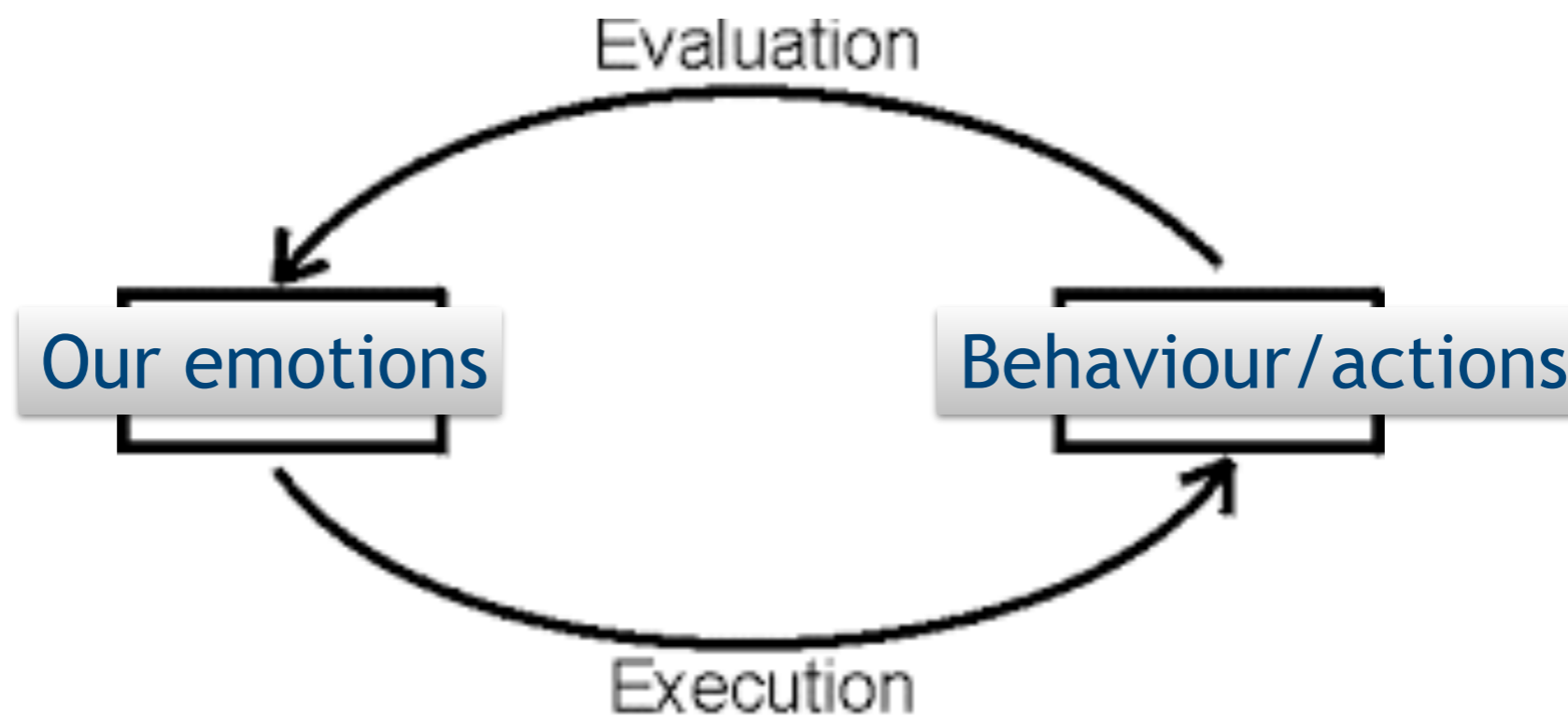
Limitation:
how to run studies in-the-wild?

Rethink causal relationships

The number of wolves affects sheep

The number of sheep affects wolves

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Norman's Interaction Cycle

We should:

use methods from complex dynamic systems

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Objective

- In naturalistic settings
- Distinguish between
  - naturally occurring correlations
  - causal relationships
- Without intervention from researcher

Used to study ecosystems

- Do sheep affect wolves, or vice versa?
- Does rain affect tree growth?
- Does plankton affect fish growth?

- Typically used to study (in depth) single ecosystems
- Typically used to identify causality

Our contribution:

Treat each participant as an ecosystem

Summarise analyses from multiple participants (ecosystems)

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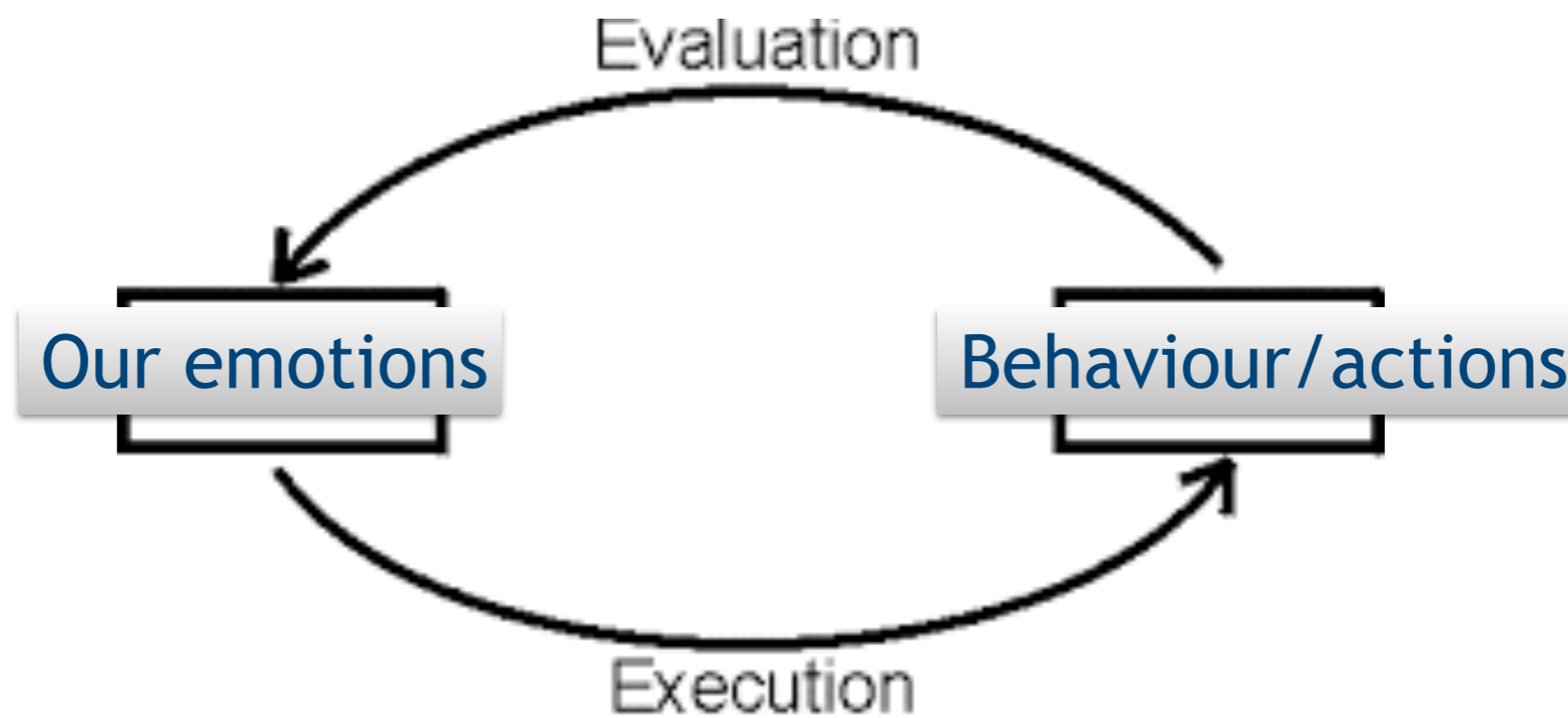
Norman's Interaction Cycle

The ~~end~~ *beginning!*

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