

SICSS-Beijing

**Revisiting the Role of Self-esteem in
Eliciting Cognitive Dissonance
Using Simulated LLM Agents**

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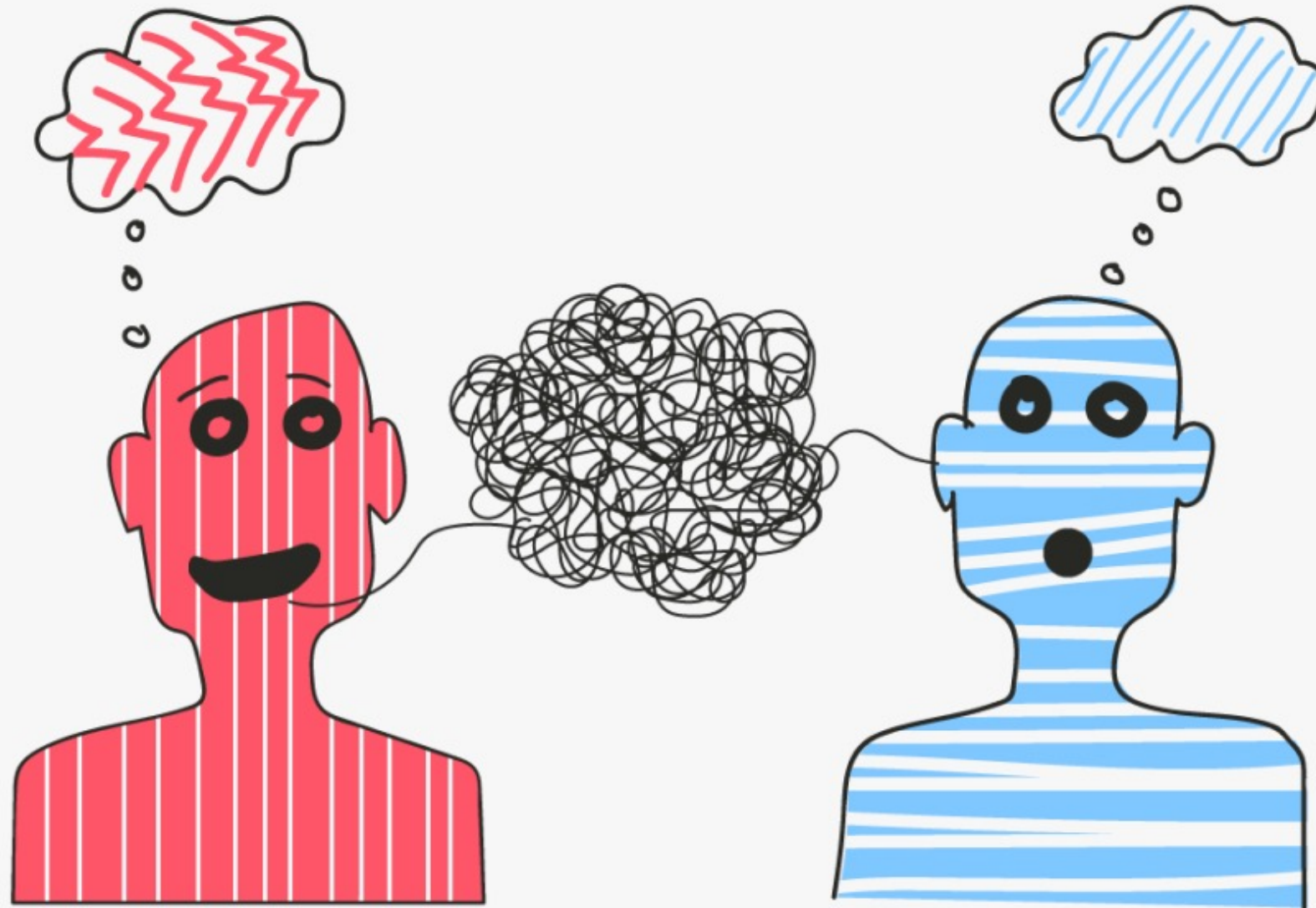
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Ruomeng Liu

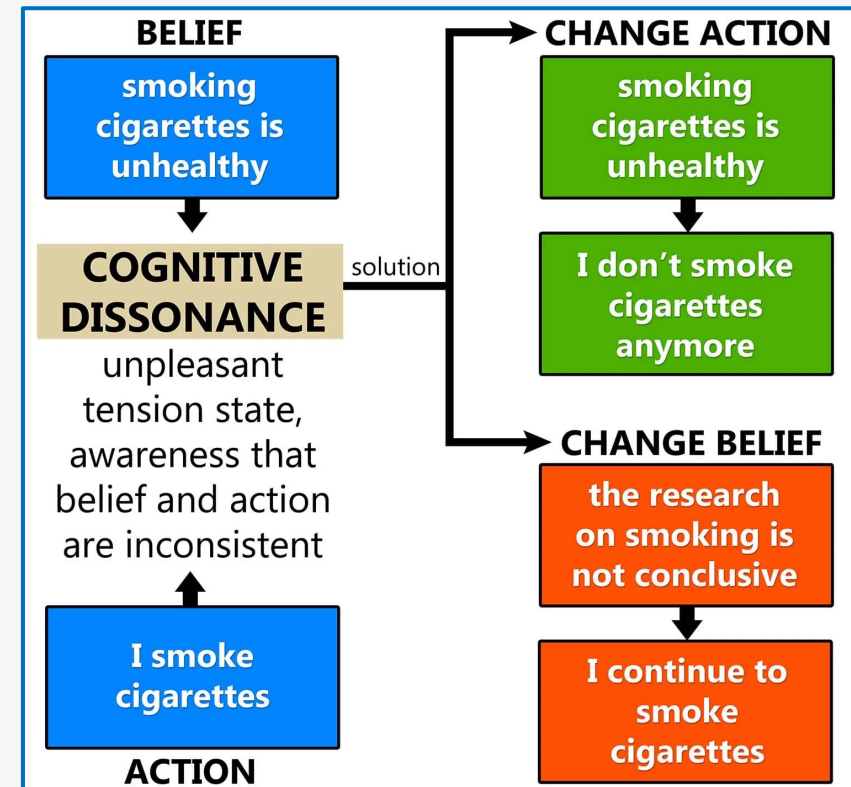
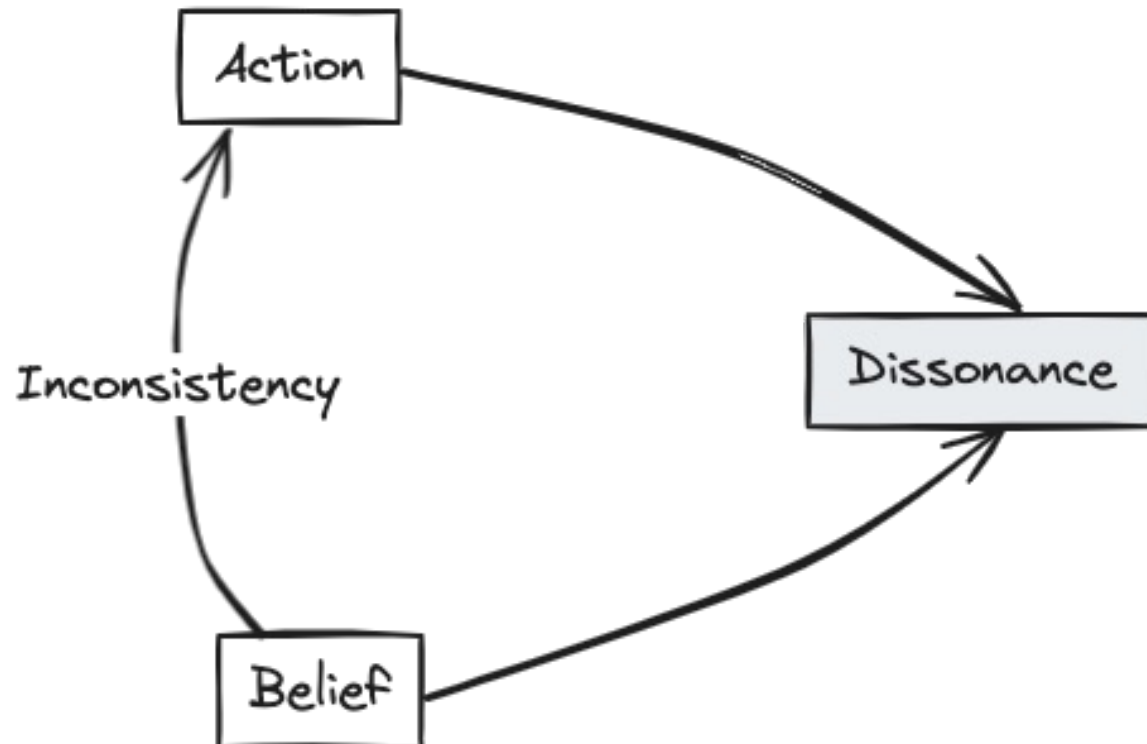
Xuanyu Shi

It's All about the Beliefs...

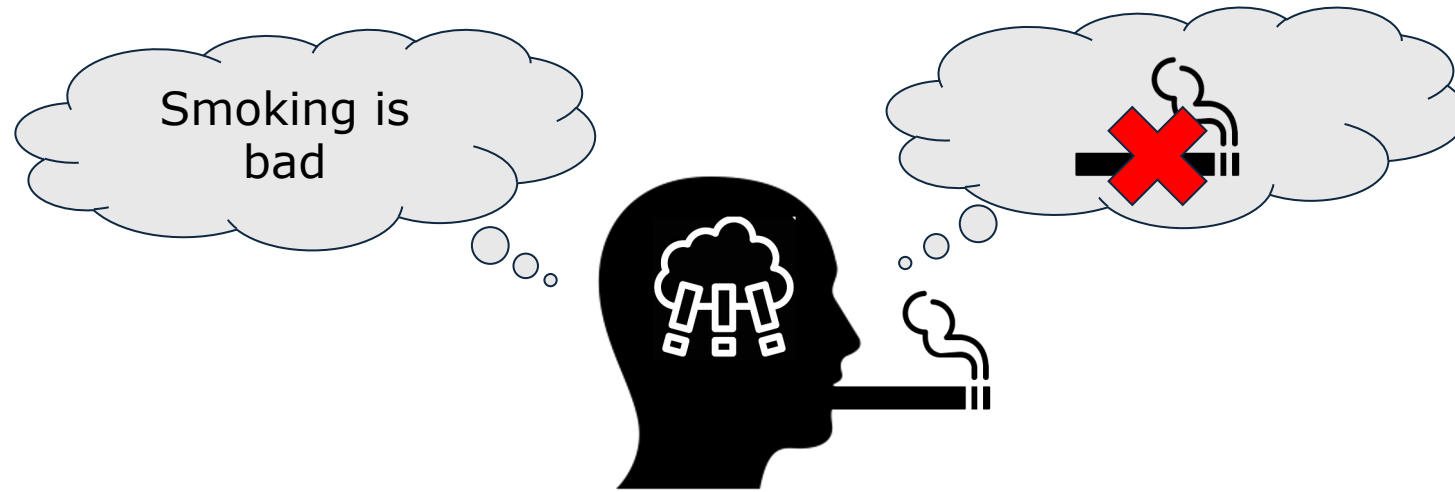


Cognitive Dissonance (Festinger, 1957)

- Refers to the **psychological discomfort** experienced when an individual's **actions are inconsistent with their beliefs** or when they hold contradictory beliefs.
- One of the most enduring, influential, and debated concepts in social psychology



How does Dissonance Arise?



Self-standard Model of Cognitive Dissonance
(Stone & Cooper, 2000)

The Role of Self-Esteem in Cognitive Dissonance



Self-esteem should systematically moderate dissonance

Self-Consistency Model (Aronson, 1969)

A Self-Standards Model of Cognitive Dissonance

Jeff Stone

University of Arizona

and

Joel Cooper

Princeton University

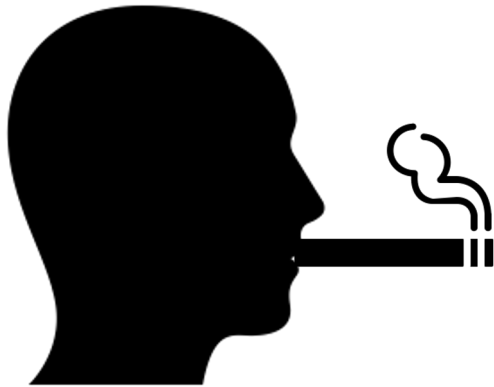
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Step 1

People Behave

People Evaluate Their
Behavior against Standards

Discrepancy
→ Dissonance



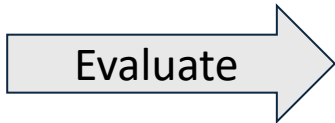
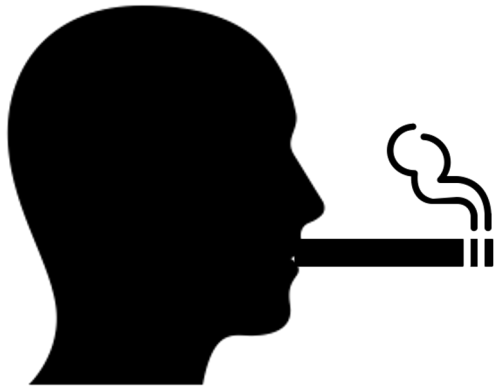
Self-standard Model of Cognitive Dissonance
(Stone & Cooper, 2000)

Step 2

People Behave

People Evaluate Their Behavior against Standards

Discrepancy → Dissonance



I am a healthy person

Personal



Smoking is harmful because it increases risk for lung cancer

Normative



Smoking helps manage stress and relax

Normative



I am the coolest among my friends

Personal

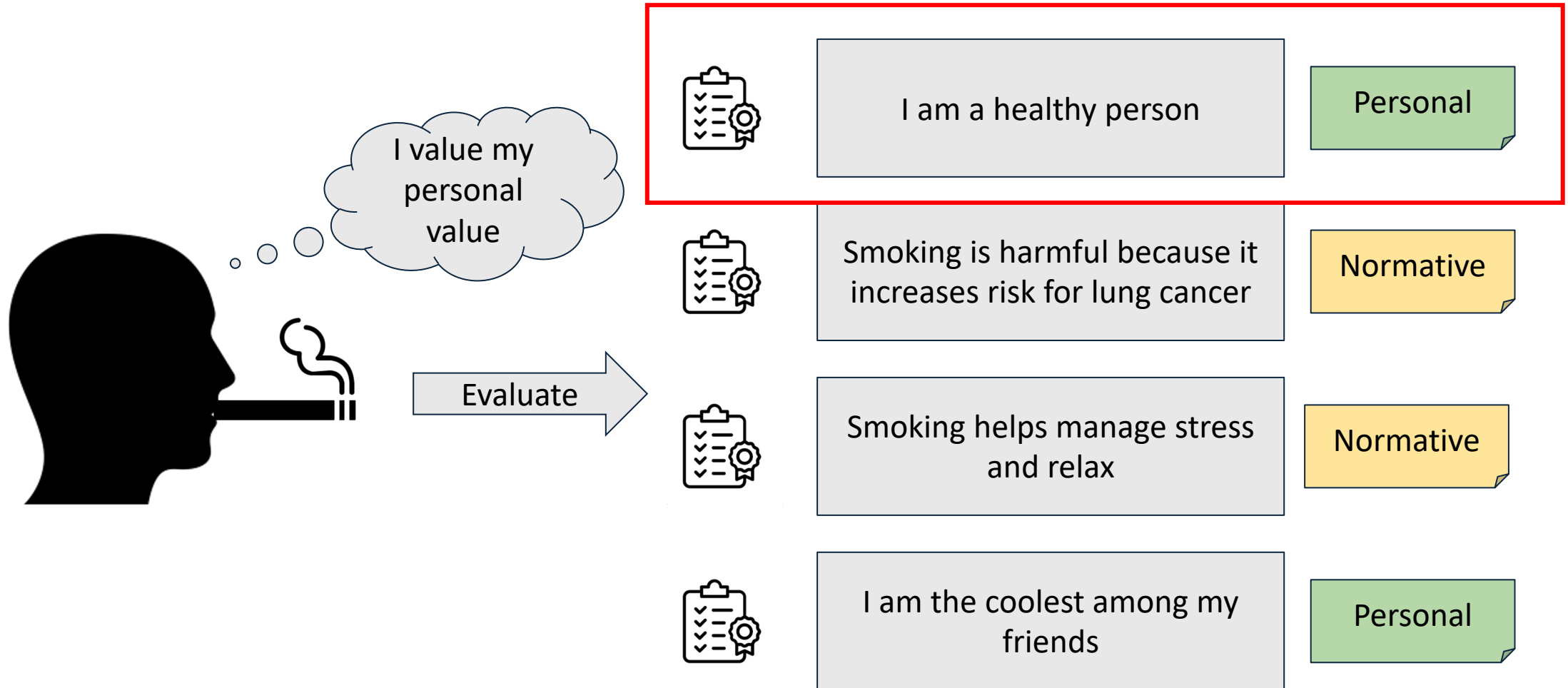
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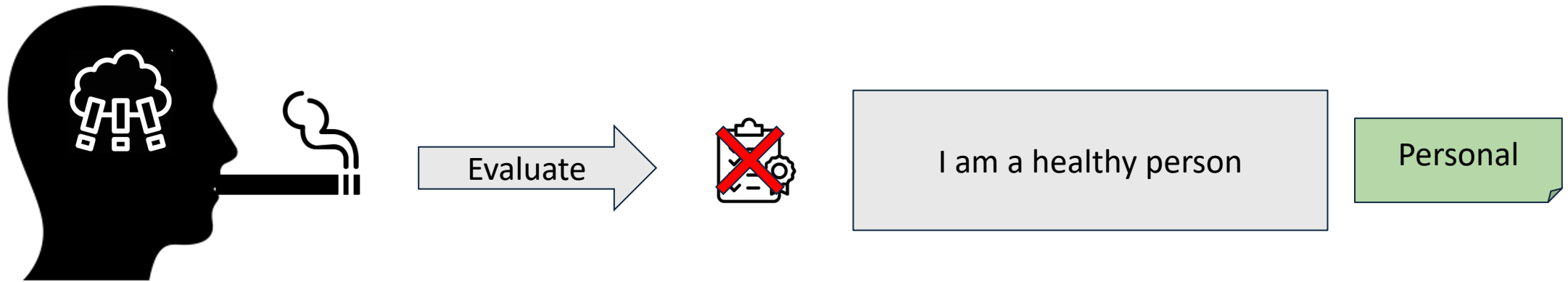
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Step 3

People Behave

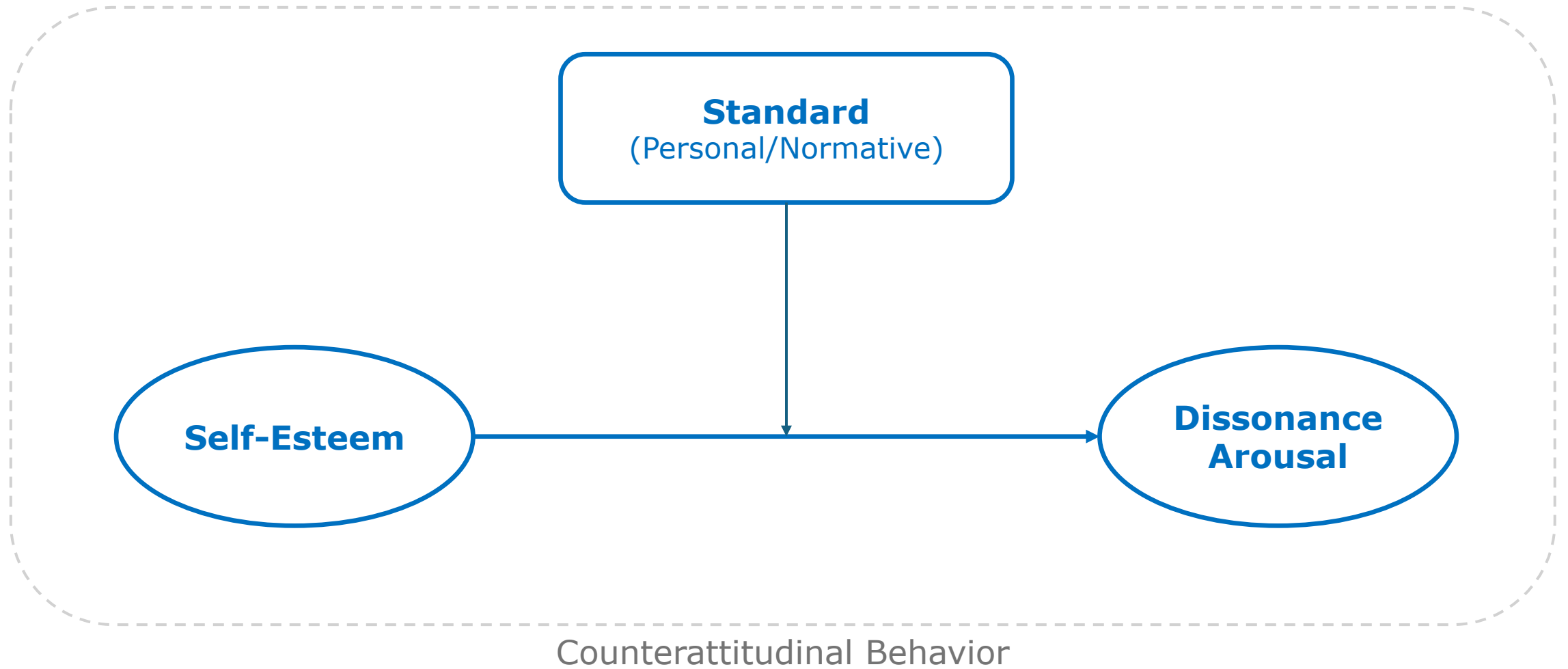
People Evaluate Their Behavior against Standards

Discrepancy → Dissonance

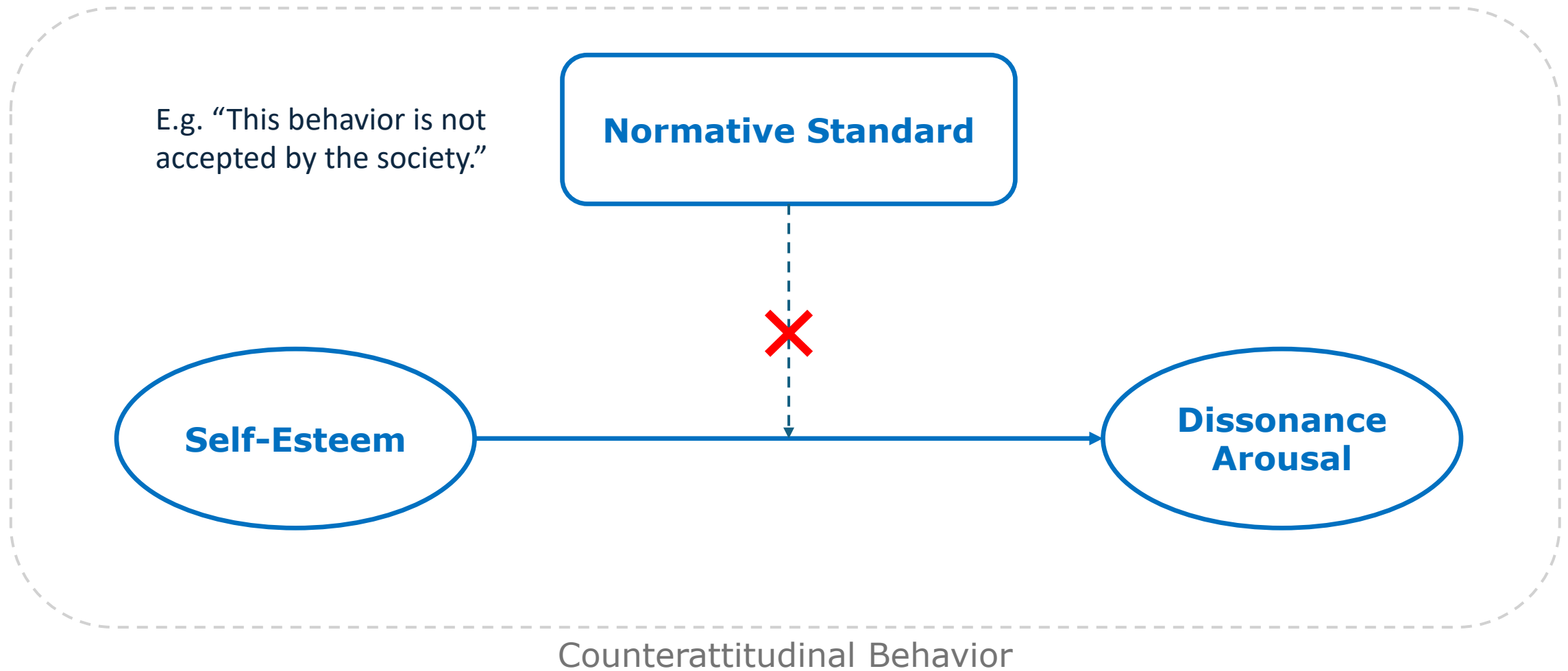


Self-standard Model of Cognitive Dissonance
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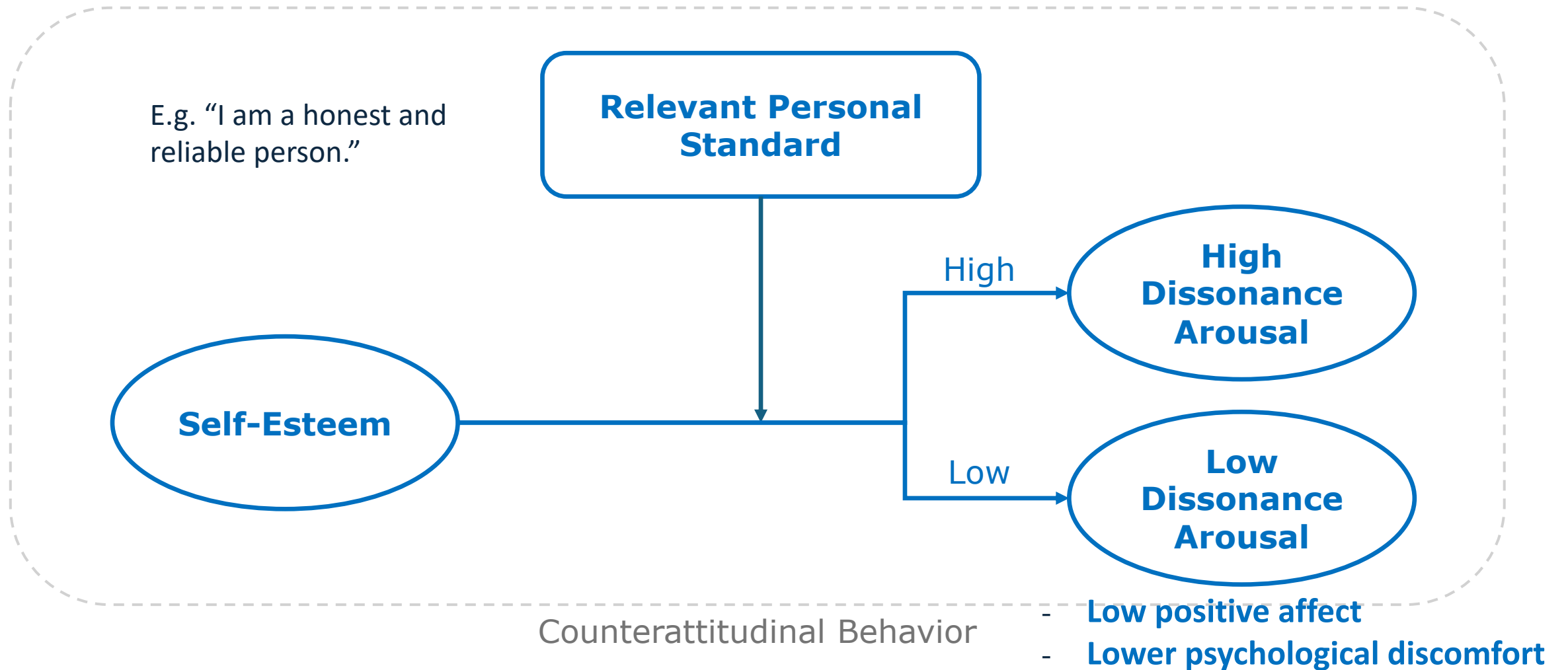
Self-standard Model of Cognitive Dissonance



Self-standard Model of Cognitive Dissonance



Self-standard Model of Cognitive Dissonance



Standard as Moderator: Personal Standard

Self-Consistency for Low Self-Esteem in Dissonance Processes: The Role of Self-Standards

Jeff Stone

University of Arizona

The self-consistency revision of cognitive dissonance theory predicts that people with low self-esteem are less likely to experience dissonance arousal compared to people with high self-esteem. Two experiments investigated how the accessibility of different self-standards in the context of a dissonant act activates the consistency role of self-esteem in the process of cognitive dissonance arousal. In Experiment 1, after participants wrote a counter-

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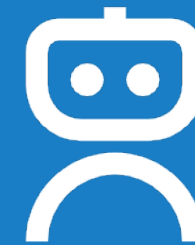
Aronson further reasoned that many of the early dissonance experiments tacitly assumed that participants held positive expectations for moral and competent behavior. Would misleading someone about the dullness

Experiment on LLM Agent Instead

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Why LLM?

Cost-effective



Easy to deploy



Direct Manipulation



* Self-Esteem
Level

Anthropomorphic



Are LLMs Appropriate for Psychological Experiments?

Perceptual Analysis

- (Li et al., 2023)

Morality

- (see Dillion et al., 2023 for review)

False Belief Task as Children

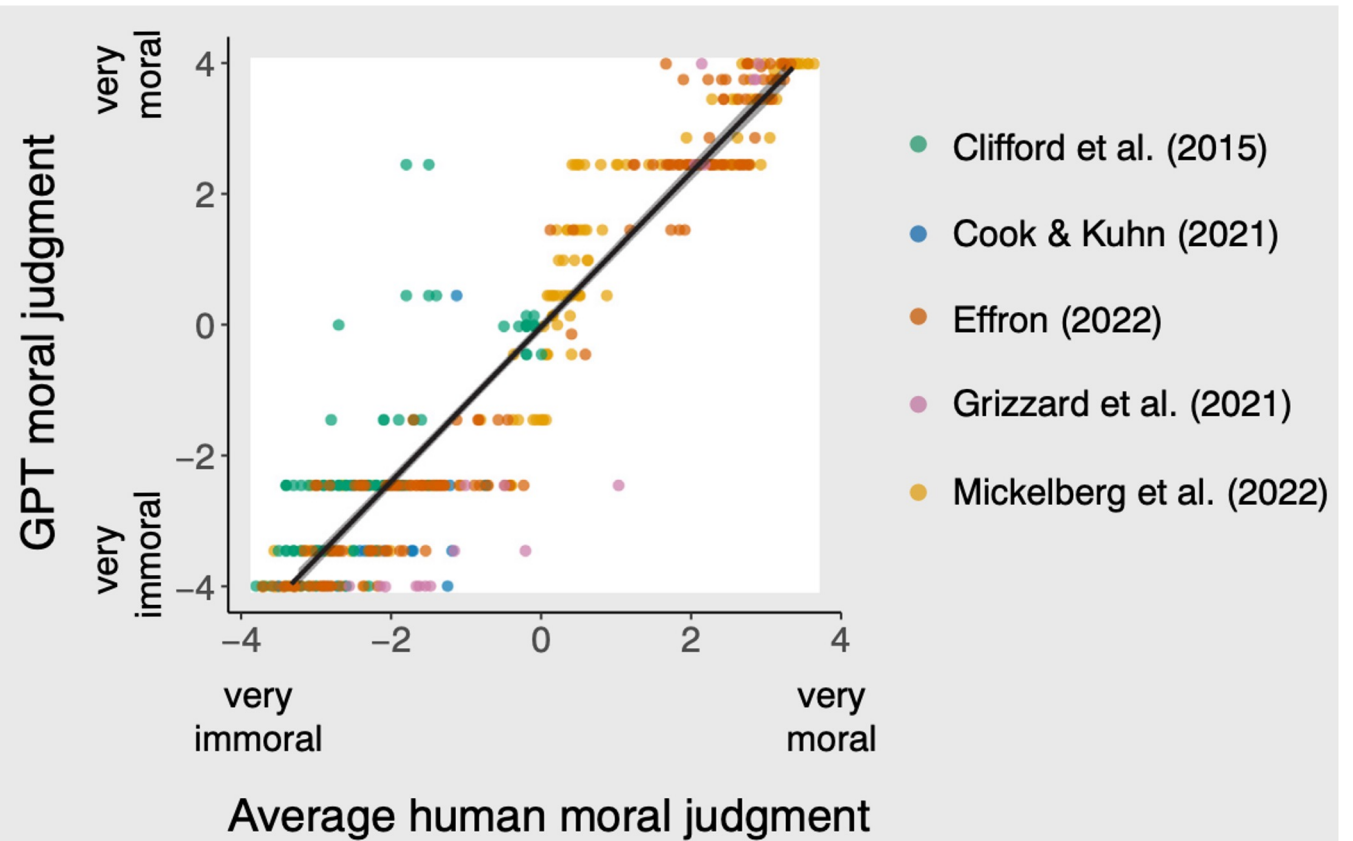
- (Milicka et al., 2024)

Voting Behavior

- (Argyle, 2023)

Political Opinions

- (Hwang et al., 2023)



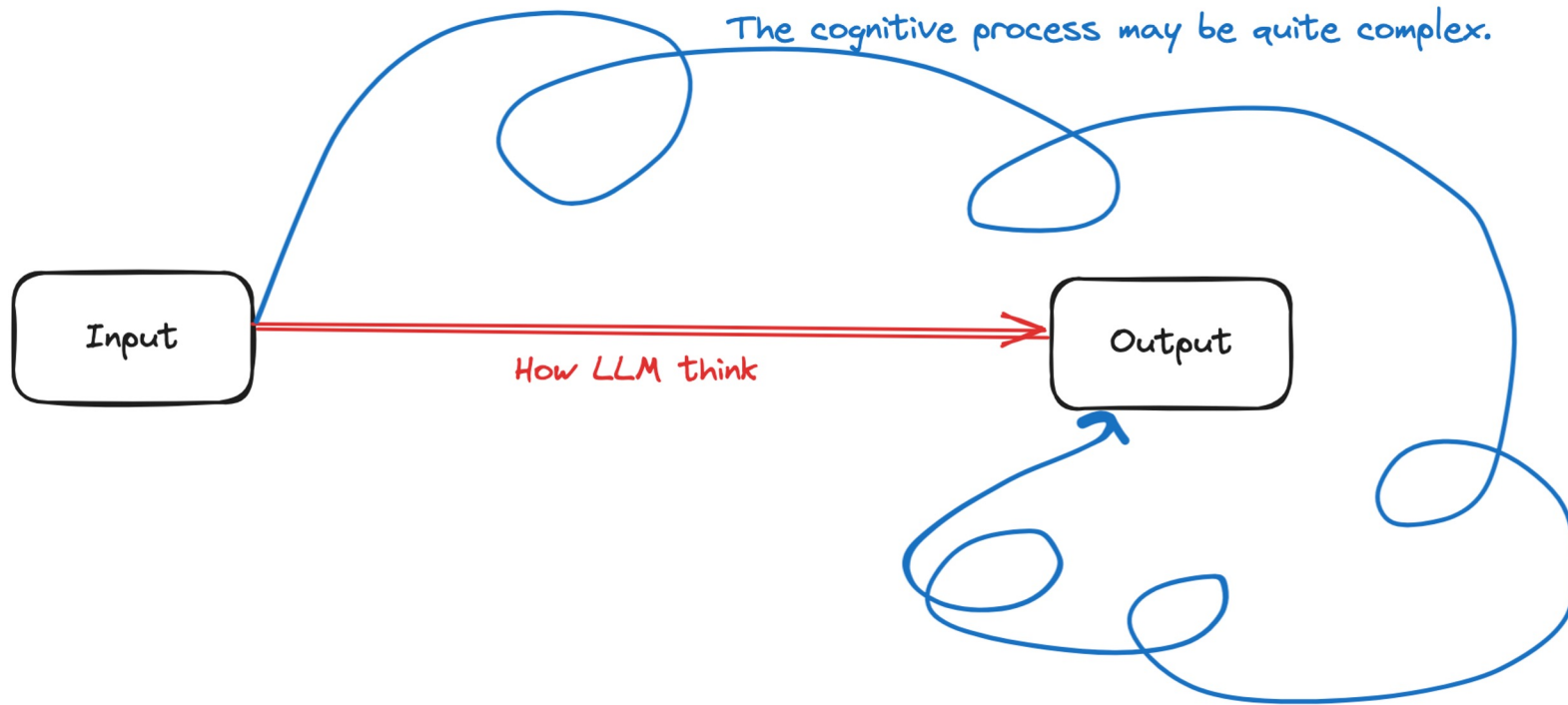
Research Questions

- Can LLMs simulate human behavior influenced by self-esteem?
- How can LLMs provide new insights into the relationship between self-esteem and cognitive dissonance?

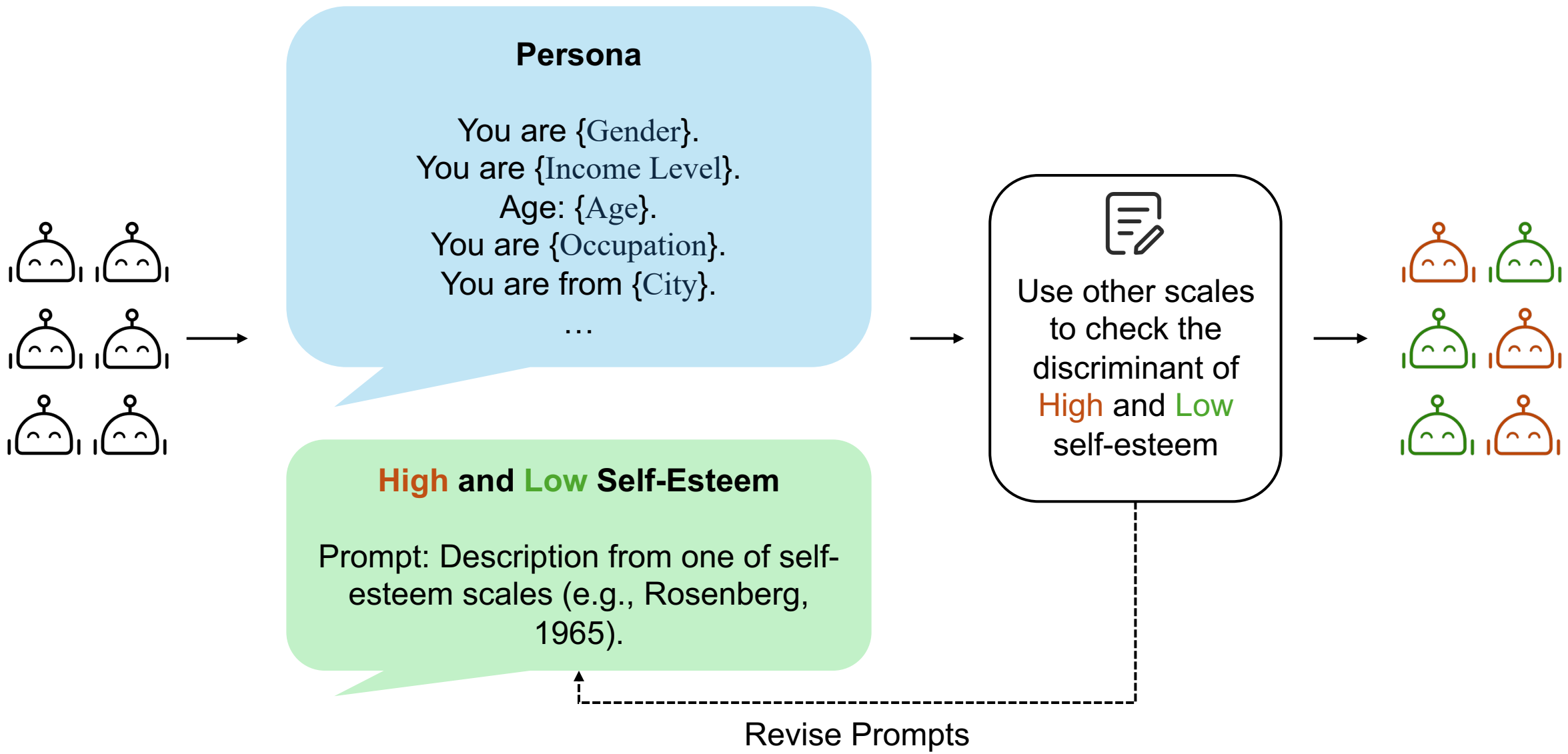
Additional Concern



sycophancy
(Sharma et al., 2023)

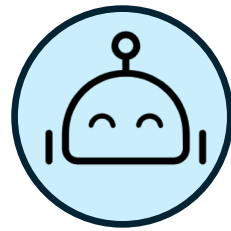


Alignment in real behavior pattern?





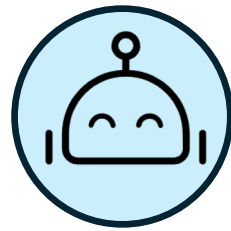
What is your attitude towards {Event}, using a 11-point scale where 1 means strongly disagree and 11 means strongly agree?



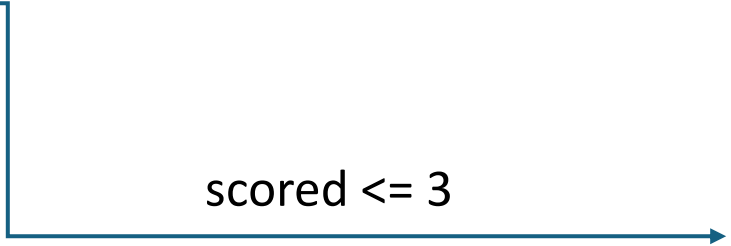
Score: 3.
Reason: @#^&\$@#&\$....



What is your **attitude** towards {Event}, using a 11-point scale where 1 means strongly disagree and 11 means strongly agree?



Score: 3.
Reason: @#^&\$@#&\$....



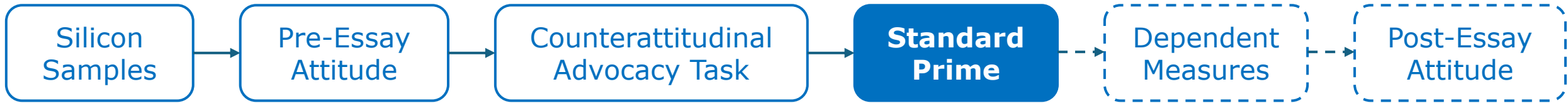
Following Experiment



Whereas we would like to stress the voluntary nature of your decision regarding which side of the issue to write on, we currently need **strong, forceful arguments in support of {Event}**. Please be aware that if you do not want to complete this task, you may stop participating now without any loss.



Essay:
.....



Here is a group of words that can be **unscrambled** to form a grammatically **correct sentence**. However, one word does not belong in the word group and should be omitted from the sentence they form. Your goal is to complete the sentence scrambles as quickly as possible. For example, [car, birds, a, gas, needs] → "A car needs gas."



Got it! Let's start!



Personal Standard

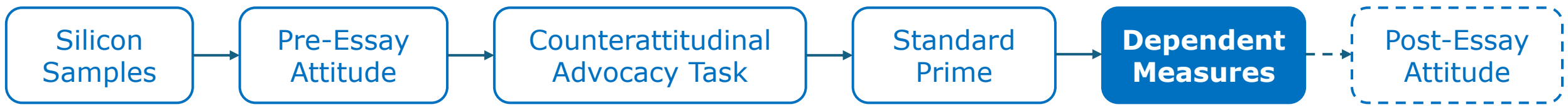
- I follow my personal standards.
- I am responsible to myself.
- I have expectations for my behavior.
- My private aspirations are important.
- Individual morals guide my behavior.
- ...

Neutral Prime

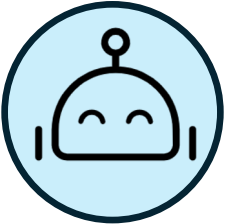
- A car needs gas.
- The dog eats food.
- A phone rings.
- A pencil is sharp.
- Birds fly south.
- ...

Normative Standards

- I follow social standards.
- I am responsible to others.
- I know the rules for behavior.
- Public obligations are important.
- Social morals guide my behavior.
- ...

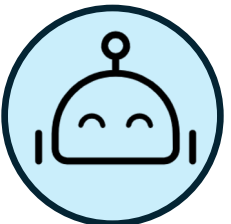


From 1 (does not apply at all) to 7 (applies very much), please rate your current mood state.
 Q1: I feel {Mood State} now.



A1: 3.

Q2: I feel {Mood State} now.



A2: 7.

psychological discomfort
uncomfortable, uneasy, bothered
negative affect
angry toward myself, dissatisfied with myself, disgusted with myself, annoyed with myself
positive affect
happy, good, friendly, energetic, optimistic



Now, what is your **attitude** towards {Event}, using a 11-point scale where 1 means strongly disagree and 11 means strongly agree?



Score: 7.
Reason: @#^&\$@#&\$....

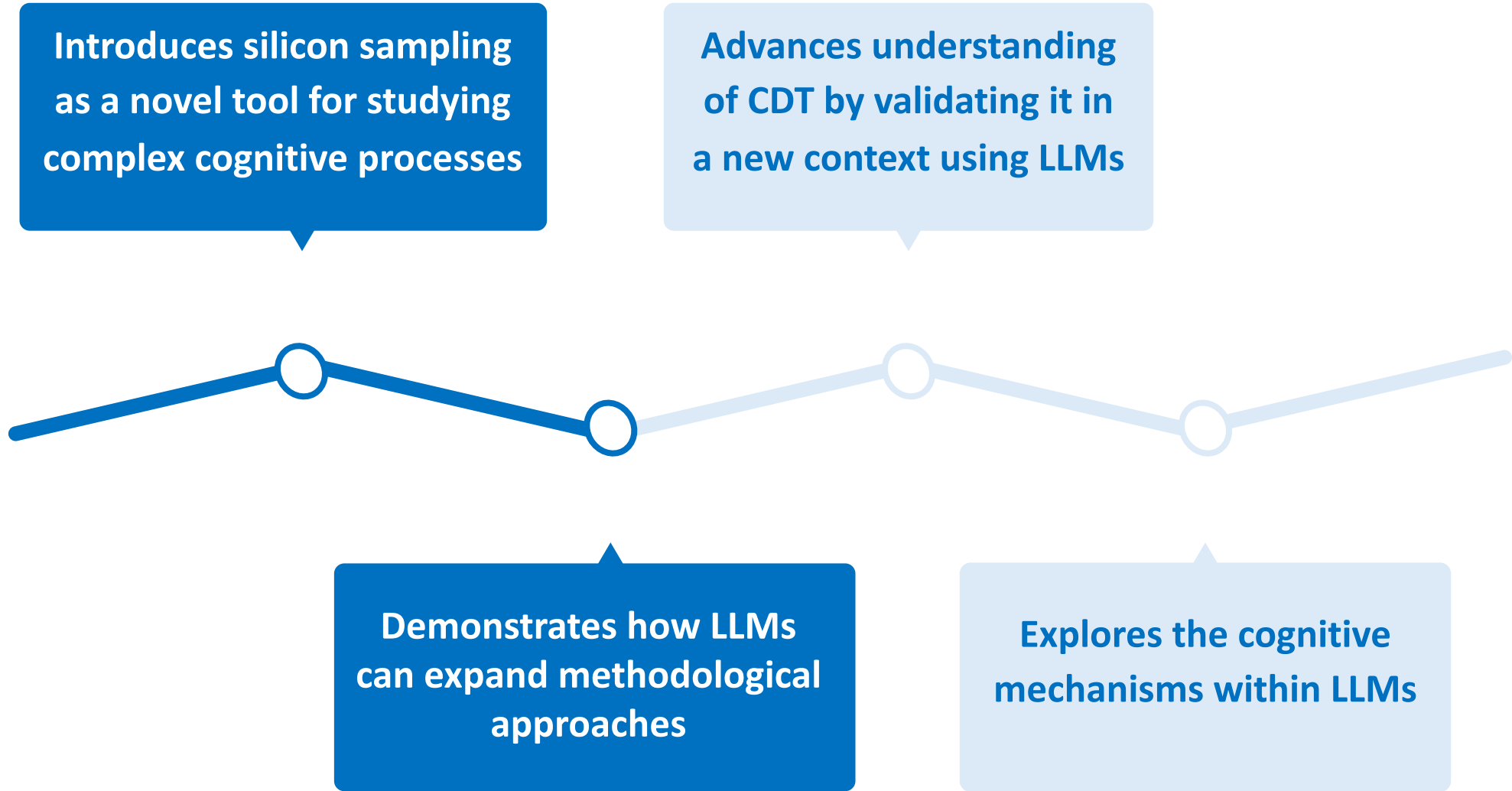
Contributions

Introduces silicon sampling as a novel tool for studying complex cognitive processes

Advances understanding of CDT by validating it in a new context using LLMs

Demonstrates how LLMs can expand methodological approaches

Explores the cognitive mechanisms within LLMs





Thanks for Watching!