Causal selection and causal decision theory

Philosophical Foundations of Explanation

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UNIVERSITY
OF AMSTERDAM

Plan

1. Causal selection
   - The flavours of modality
   - How we know what not to think
   - The psychological representation of modality
   - The three strikes law

Abnormal inflation

Abnormal inflation. Suppose that an outcome depends on a causal factor C as well as an alternative causal factor A, such that the outcome will only occur if both C and A occur. Then people will be more inclined to say that C caused the outcome when they regard C as abnormal than when they regard C as normal.

From Icard, Kominsky, and Knobe (2017, p. 81)

Abnormal inflation with statistical norms

(1) a. The match caused the forest fire.
b. The oxygen caused the forest fire.

Abnormal inflation with moral norms

The receptionist in the philosophy department keeps her desk stocked with pens. The administrative assistants are allowed to take pens, but faculty members are supposed to buy their own.

Version 1. *The administrative assistants typically do take the pens. Unfortunately, so do the faculty members. The receptionist has repeatedly e-mailed them reminders that only administrators are allowed to take the pens.*

Version 2. *The receptionist in the philosophy department keeps her desk stocked with pens. Both the administrative assistants and the faculty members are allowed to take the pens, and both the administrative assistants and the faculty members typically do take the pens. The receptionist has repeatedly e-mailed them reminders that both administrators and professors are allowed to take the pens.*

Abnormal inflation with moral norms

On Monday morning, one of the administrative assistants encounters Professor Smith walking past the receptionist's desk. Both take pens. Later, that day, the receptionist needs to take an important message... but she has a problem. There are no pens left on her desk.

(2) The professor caused the problem.

Supercession. Suppose an outcome depends on a causal factor C as well as an alternative causal factor A, such that the outcome will only occur if both C and A occur. Then people will be less inclined to say that C caused the outcome if A is abnormal than if A is normal.

Supercession with statistical norms

Alex is playing a board game. Every turn of the game involves simultaneously rolling two six-sided dice and flipping a fair coin. Alex will either win or lose the game on his next turn.

Version 1. *Alex will only win the game if the total of his dice rolls is greater than 2 AND the coin comes up heads. It is very likely that he will roll higher than 2, and the coin has equal odds of coming up heads or tails.*

Version 2. *Alex will only win the game if the total of his dice rolls is greater than 11 AND the coin comes up heads. It is very unlikely that he will roll higher than 11, but the coin has equal odds of coming up heads or tails.*

> *Alex flips the coin and rolls his dice at exactly the same time. The coin comes up heads, and he rolls a 12, so just as expected, he rolled greater than 2. Alex wins the game.*

Kominsky et al. (2015): participants were significantly less inclined to say that Alex won because of the coin flip when the dice roll was abnormal than when it was normal.

Supercession with moral norms

Imagine a motion detector that goes off whenever two people are in the room at the same time. Suzy and Billy enter the room at the same time, and the motion detector goes off.

In one condition, Billy is supposed to be in the room, while in the other condition he is specifically not supposed to be in the room.

Suzy was judged to be significantly less a cause of the motion detector going off when Billy violated the prescriptive norm than when he acted in accordance with the prescriptive norm.

(Kominsky et al. 2015)

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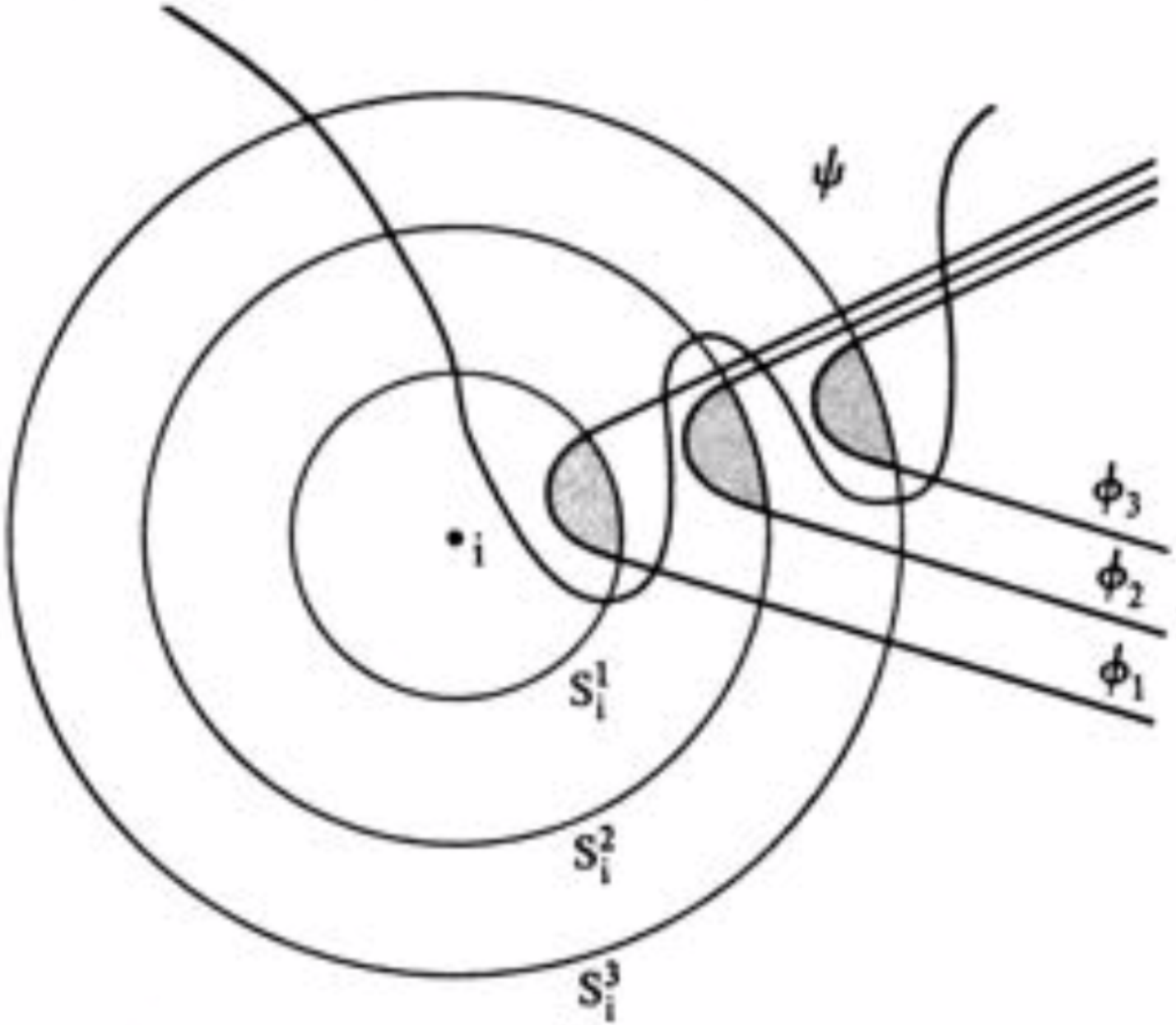
ψ
•i
S_i^1
S_i^2
S_i^3
ϕ_3
ϕ_2
ϕ_1

Kratzer's answer to the Samaritan paradox

(3) There must be no murder.

(4) If a murder occurs, the jurors must convene.

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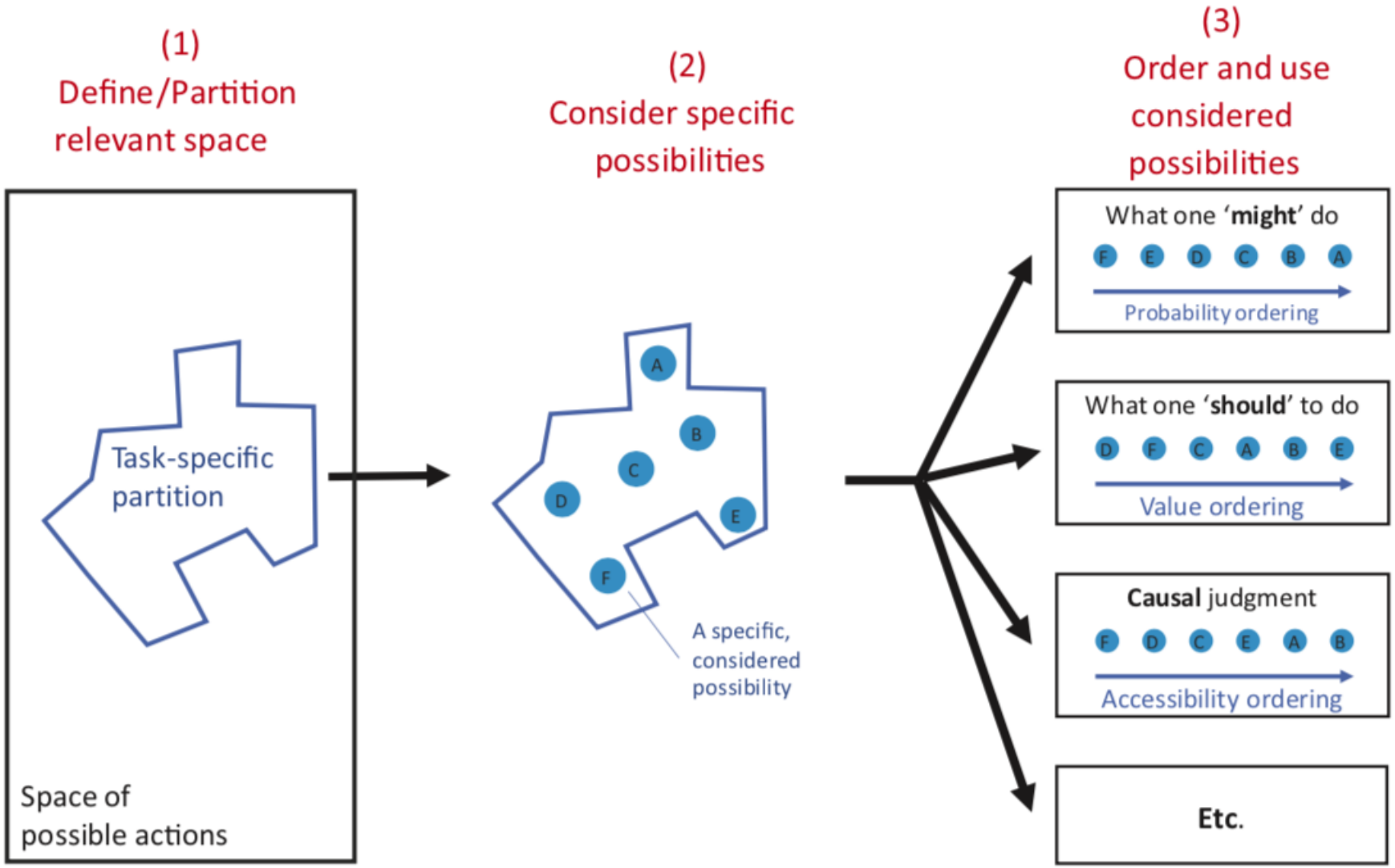
Trends in Cognitive Sciences

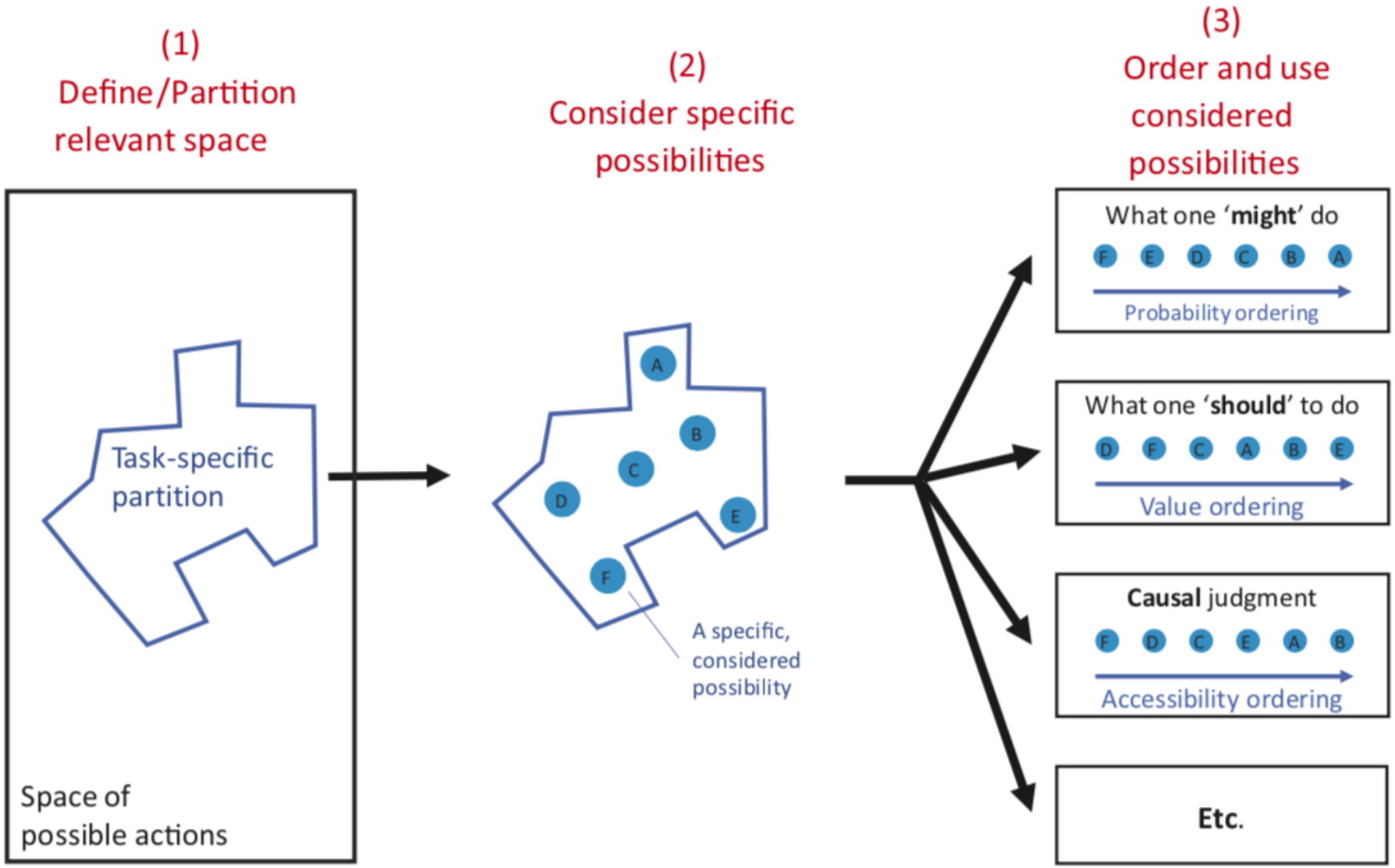
Opinion

How We Know What Not To Think

Jonathan Phillips,[1,*] Adam Morris,[2] and Fiery Cushman[2]

Humans often represent and reason about unrealized possible actions – the vast infinity of things that were not (or have not yet been) chosen. This capacity is central to the most impressive of human abilities: causal reasoning, planning, linguistic communication, moral judgment, etc. Nevertheless, how do we select possible actions that are worth considering from the infinity of unrealized actions that are better left ignored? We review research across the cognitive sciences, and find that the possible actions considered by default are those that are both likely to occur and generally valuable. We then offer a unified theory of why. We propose that (i) across diverse cognitive tasks, the possible actions we consider are biased towards those of general practical utility, and (ii) a plausible primary function for this mechanism resides in decision making.


(1)
Define/Partition
relevant space
Task-specific
partition
Space of
possible actions
(2)
Consider specific
possibilities
A
B
C
D
E
F
A specific,
considered
possibility
(3)
Order and use
considered
possibilities
What one 'might' do
F E D C B A
Probability ordering
What one 'should' to do
D F C A B E
Value ordering
Causal judgment
F D C E A B
Accessibility ordering
Etc.


(1)
Define/Partition relevant space
(2)
Consider specific possibilities
(3)
Order and use considered possibilities
Task-specific partition
Space of possible actions
A
B
C
D
E
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A specific, considered possibility
What one 'might' do
F E D C B A
Probability ordering
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F D C E A B
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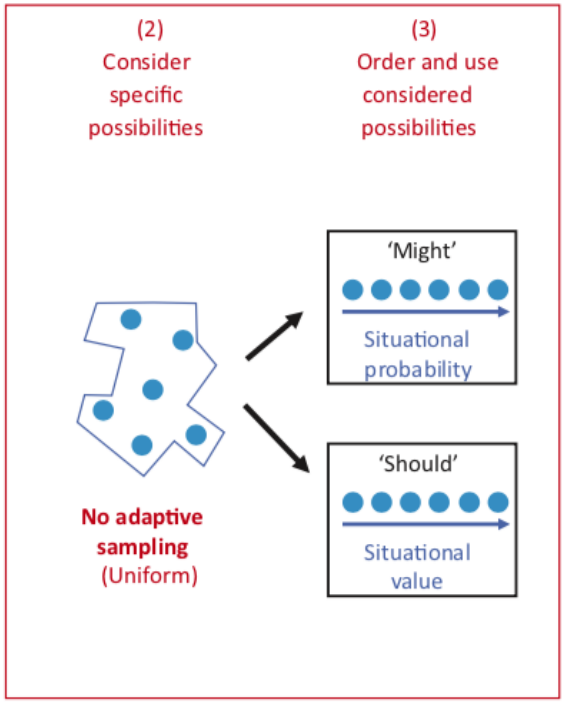
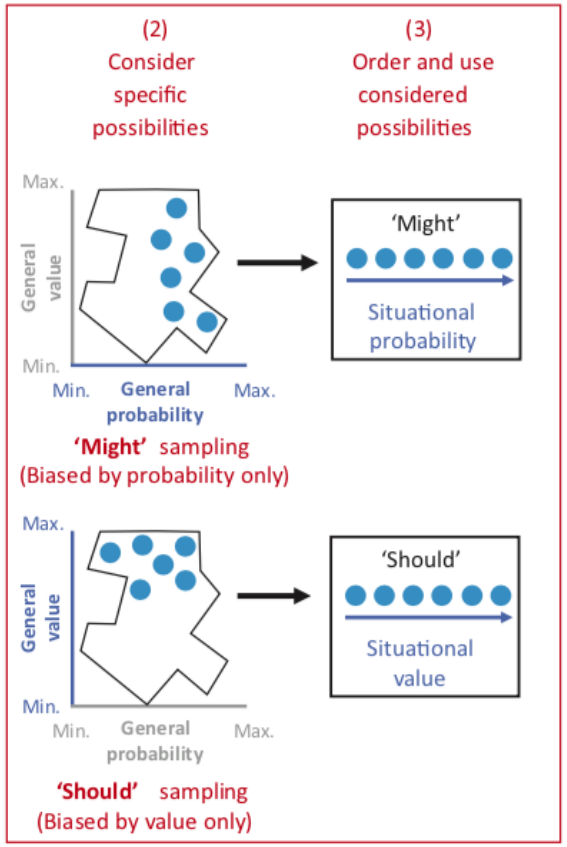
Etc.

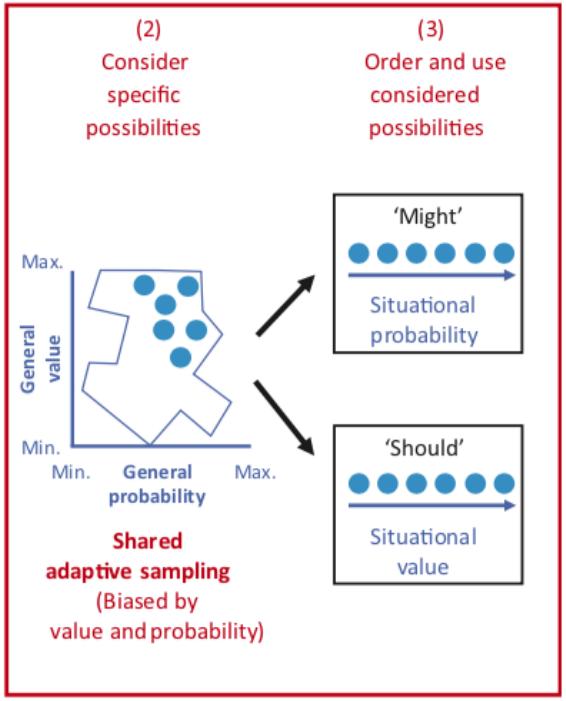
(B) No adaptive sampling model
(Traditional model)

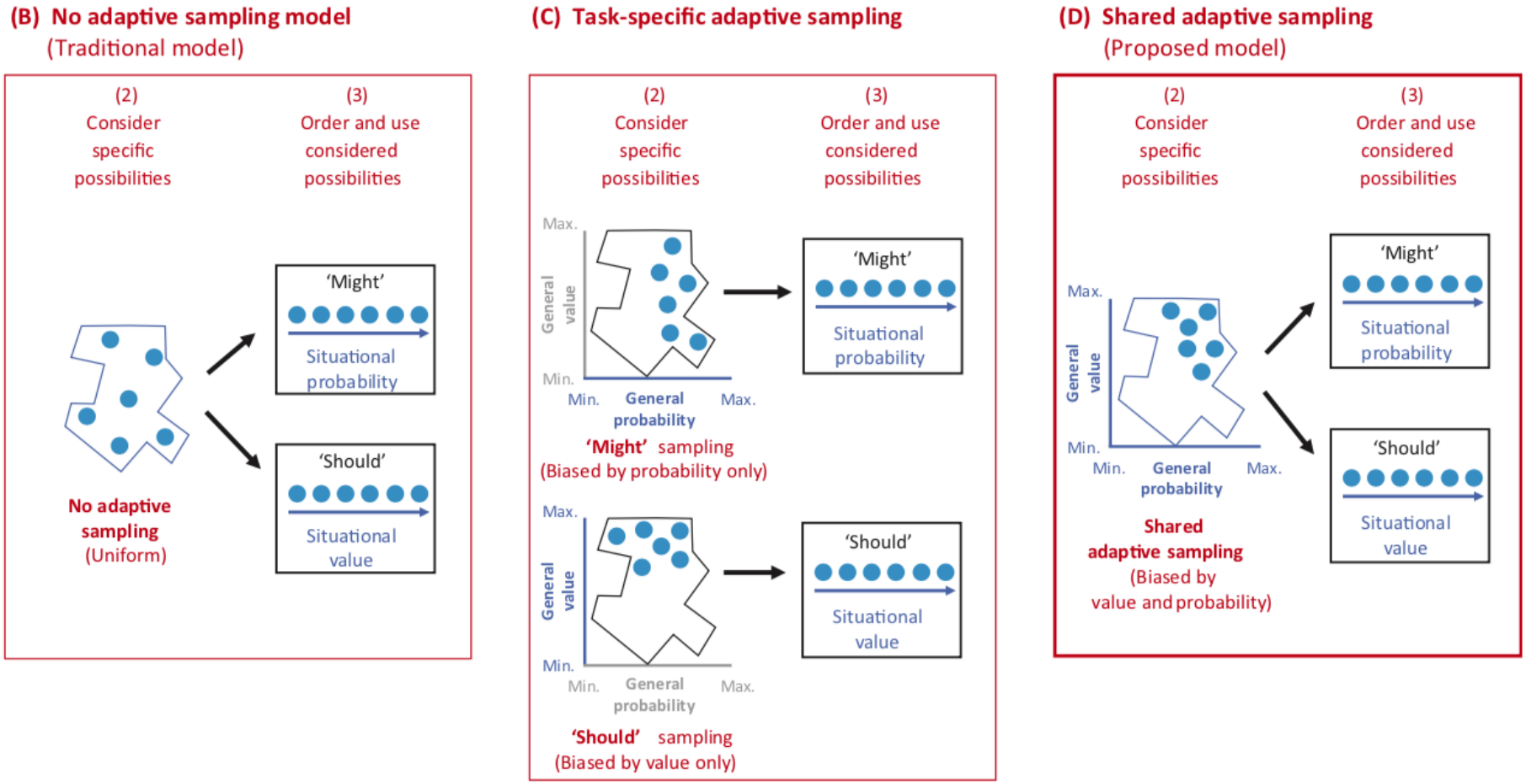


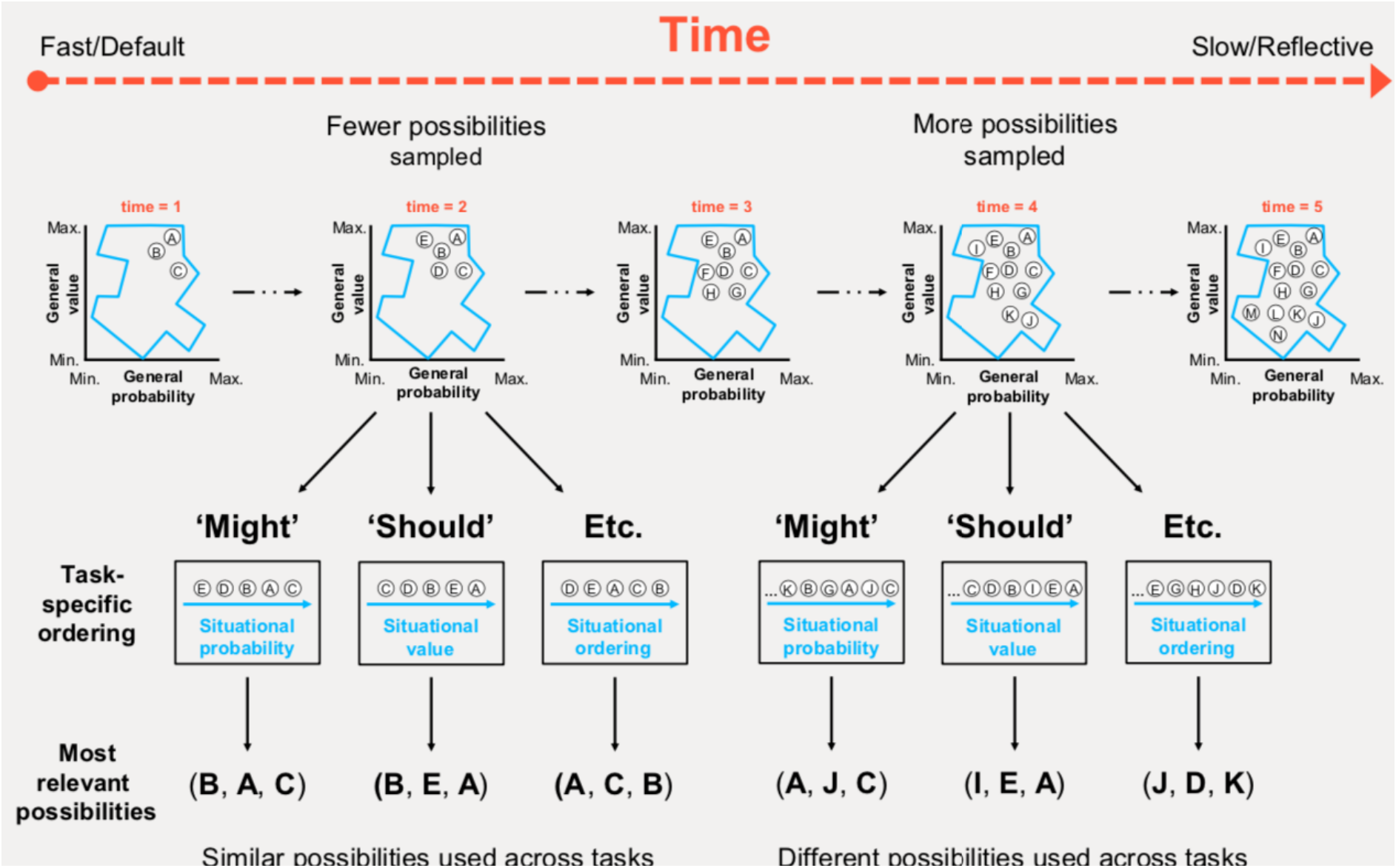
(C) Task-specific adaptive sampling

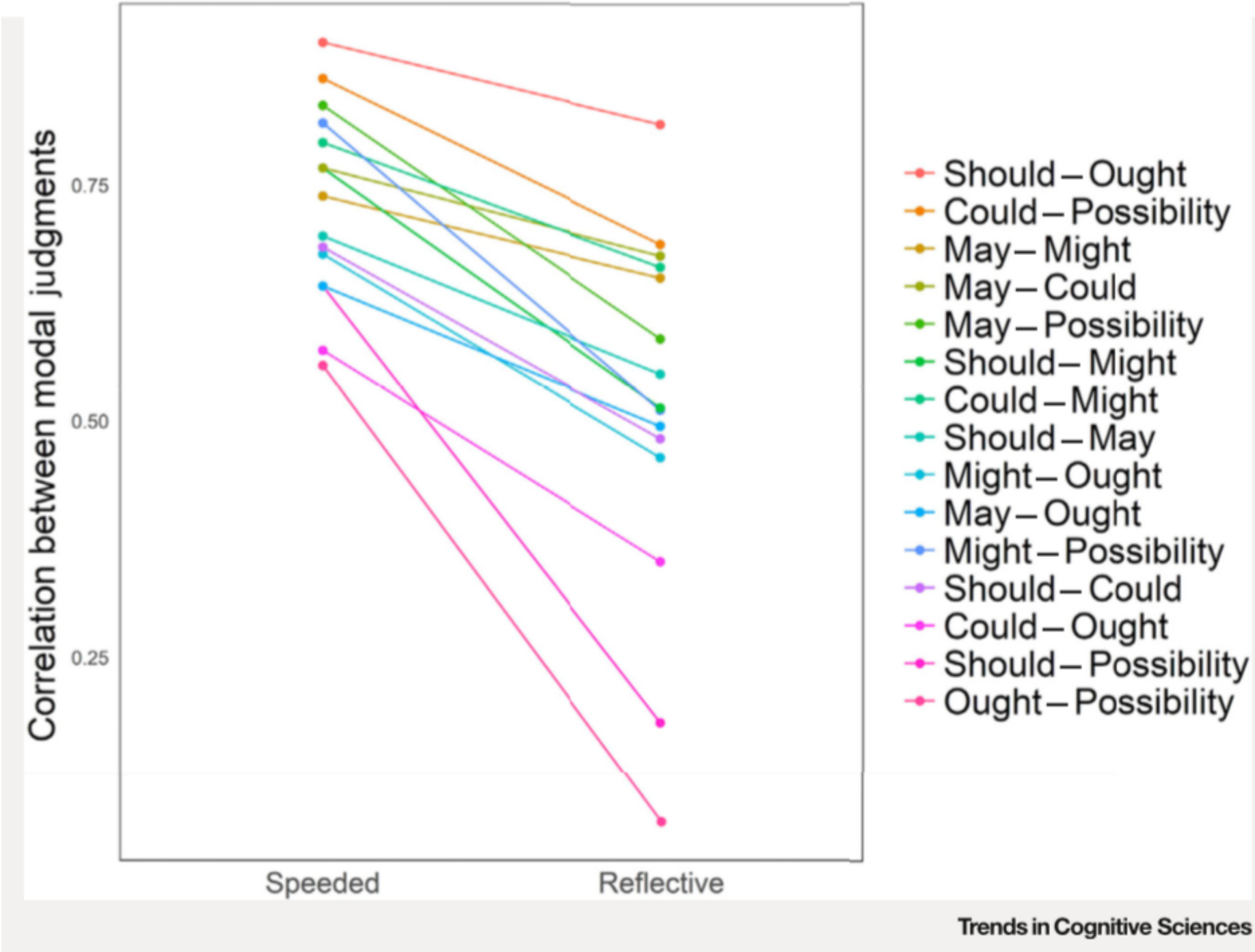


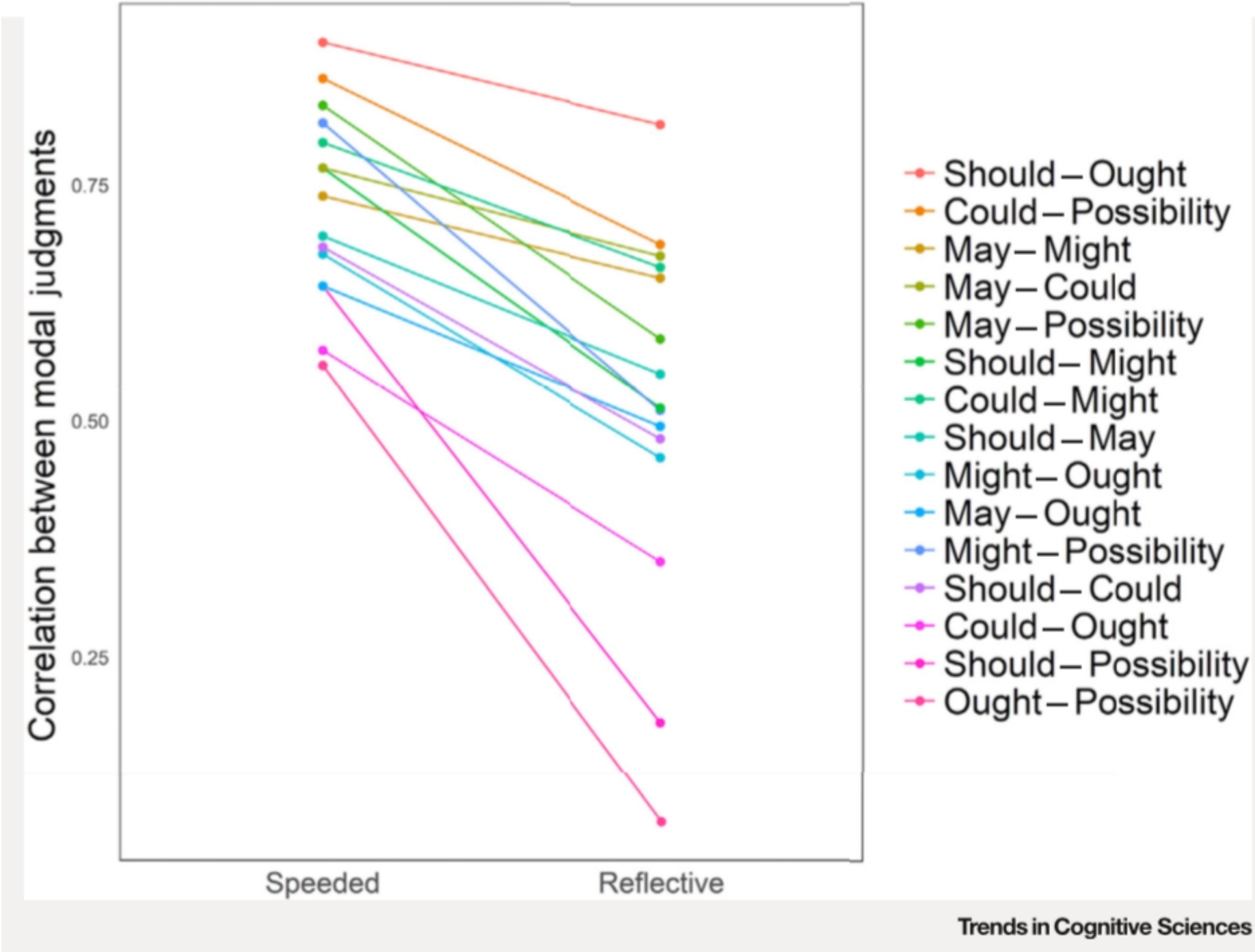
(D) Shared adaptive sampling
(Proposed model)




(B) No adaptive sampling model
(Traditional model)
(2) Consider specific possibilities
(3) Order and use considered possibilities
'Might'
Situational probability
'Should'
Situational value
No adaptive sampling
(Uniform)
(C) Task-specific adaptive sampling
(2) Consider specific possibilities
(3) Order and use considered possibilities
Max.
General value
Min.
Min. General probability Max.
'Might'
Situational probability
'Might' sampling
(Biased by probability only)
'Should'
Situational value
'Should' sampling
(Biased by value only)
(D) Shared adaptive sampling
(Proposed model)
(2) Consider specific possibilities
(3) Order and use considered possibilities
'Might'
Situational probability
'Should'
Situational value
Shared adaptive sampling
(Biased by value and probability)


Time
Fast/Default
Slow/Reflective
Fewer possibilities sampled
More possibilities sampled
time = 1
time = 2
time = 3
time = 4
time = 5
Max.
Min.
General value
General probability
'Might'
'Should'
Etc.
Task-specific ordering
Situational probability
Situational value
Situational ordering
Most relevant possibilities
(B, A, C)
(B, E, A)
(A, C, B)
(A, J, C)
(I, E, A)
(J, D, K)
Similar possibilities used across tasks
Different possibilities used across tasks


Correlation between modal judgments
0.75
0.50
0.25
Speeded
Reflective
Should – Ought
Could – Possibility
May – Might
May – Could
May – Possibility
Should – Might
Could – Might
Should – May
Might – Ought
May – Ought
Might – Possibility
Should – Could
Could – Ought
Should – Possibility
Ought – Possibility
Trends in Cognitive Sciences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Should – Could
Could – Ought
Should – Possibility
Ought – Possibility
Trends in Cognitive Sciences

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The psychological representation of modality

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[2]Program in Cognitive Science and Department of Philosophy, Yale University, New Haven, Connecticut

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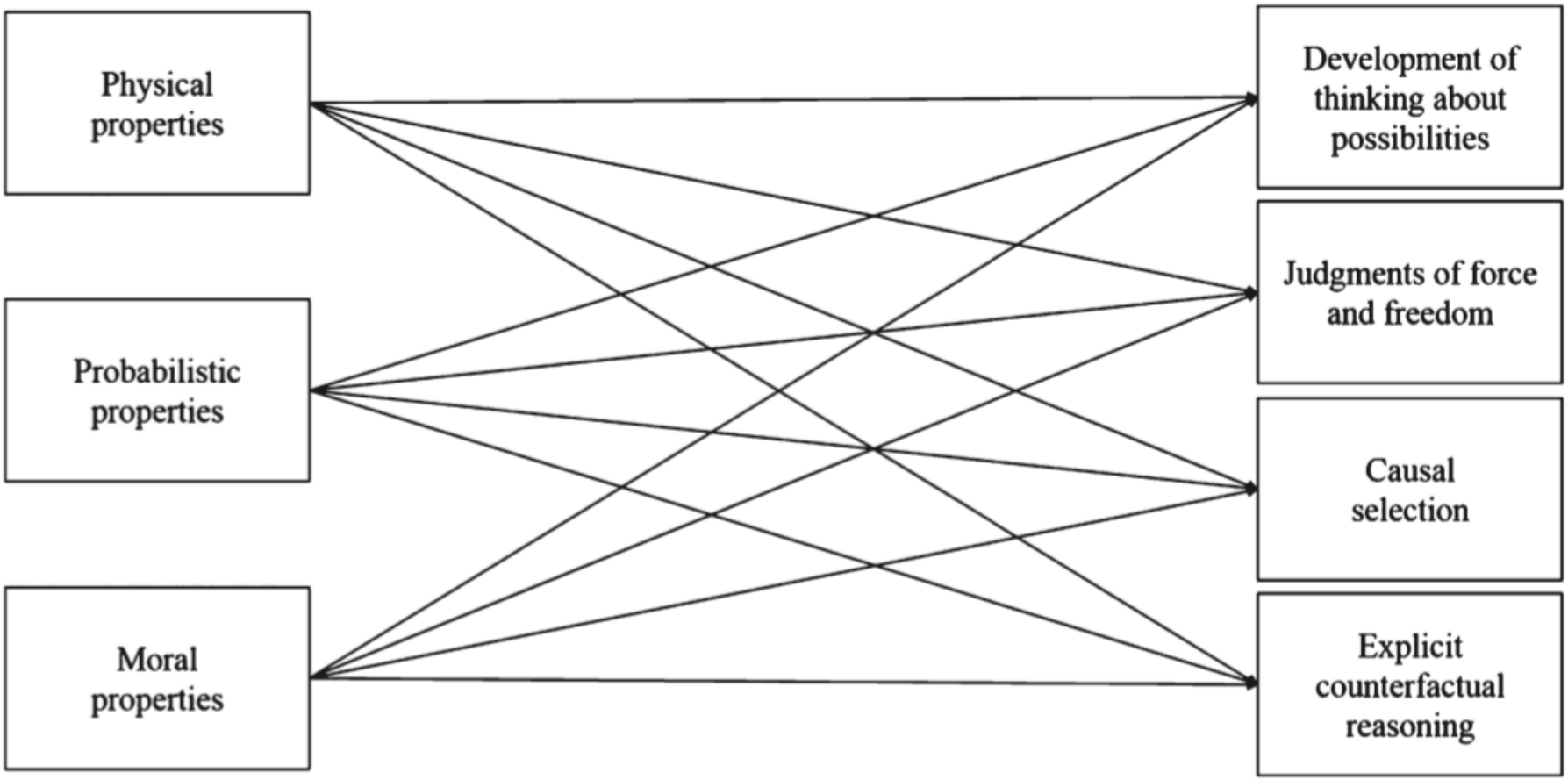
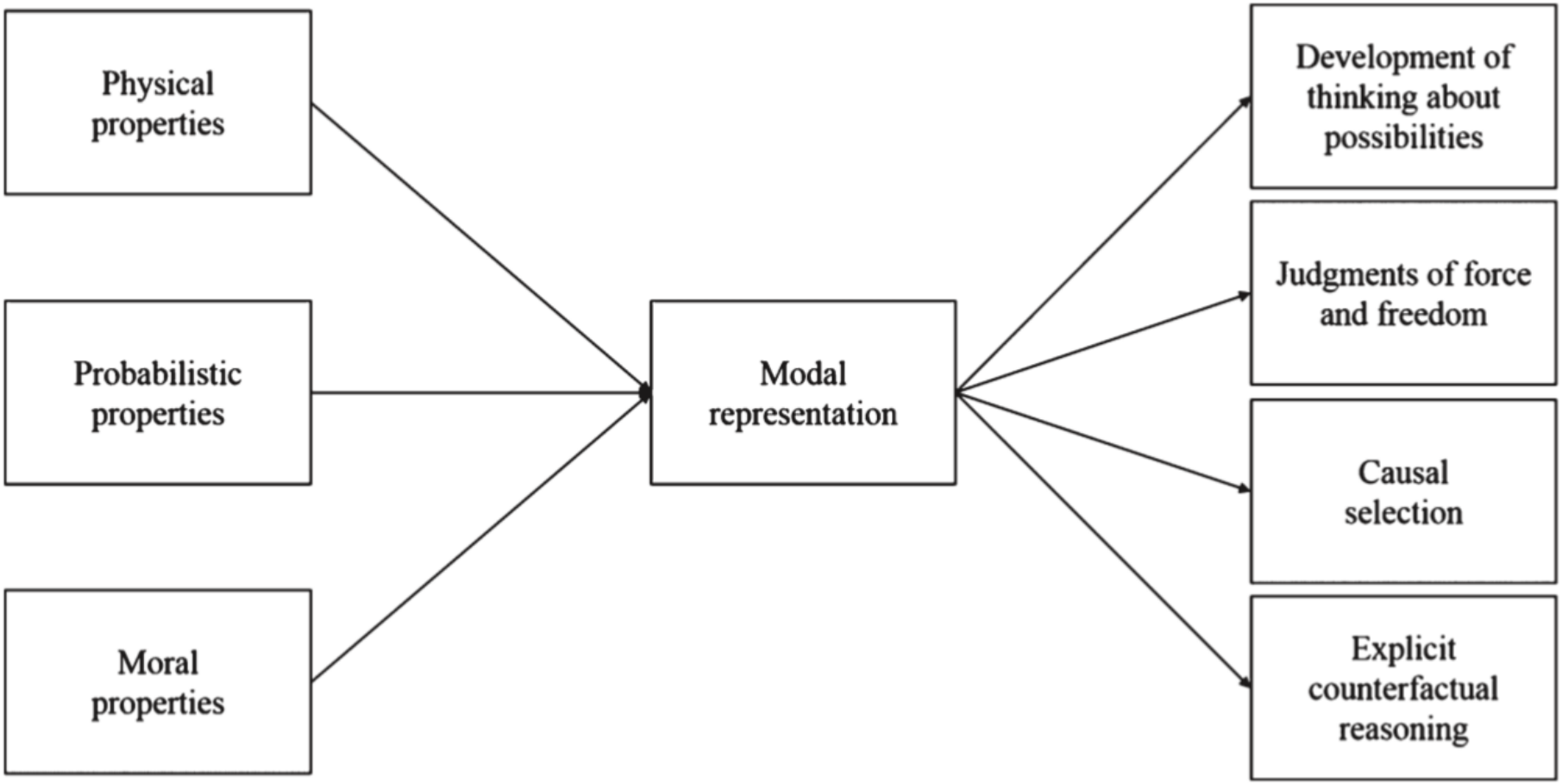
A series of recent studies have explored the impact of people's judgments regarding physical law, morality, and probability. Surprisingly, such studies indicate that these three apparently unrelated types of judgments often have precisely the same impact. We argue that these findings provide evidence for a more general hypothesis about the kind of cognition people use to think about possibilities. Specifically, we suggest that this aspect of people's cognition is best understood using an idea developed within work in the formal semantics tradition, namely the notion of modality. On the view we propose, people may have separate representations for physical, moral and probabilistic considerations, but they also integrate these various considerations into a unified representation of modality.


Physical properties
Probabilistic properties
Moral properties
Development of thinking about possibilities
Judgments of force and freedom
Causal selection
Explicit counterfactual reasoning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Modal representation
Development of thinking about possibilities
Judgments of force and freedom
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Explicit counterfactual reasoning

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https://youtu.be/JMLzjLo8yxw?t=452

Steve Kroft (interviewer): "You've got a bicycle thief, or in some cases people who had their third strike be stealing cookies, or pizza, getting 25 to life."

Gray Davis (Governor): "Well in this pizza case, this fella had five serious felony offences before he stole pizza. Let me ask you this. Do you want to make a case for people stealing pizza?"

Kroft: "No. In my mind I offer an opinion that 25 years to life is a little stiff."

Davis: "But you don't get it for stealing pizza. You get it for the accumulated offences that occurred before you stole pizza."

Kroft: "But if he didn't steal pizza, he'd still be out on the street."

Davis: "And if he didn't commit another crime he wouldn't go back to prison."