

# REASONING, SIMPLIFIED: A GUIDED TOUR

SEBASTIÁN SÁNCHEZ MARTÍNEZ

INSTITUT FÜR PHILOSOPHIE  
TU DRESDEN

10 JUNE 2026



- 1 What is Simplified Reasoning?
- 2 How is Simplified Reasoning Rational?
- 3 Epistemic Rationality through Simplified Reasoning?

- 1 What is Simplified Reasoning?
- 2 How is Simplified Reasoning Rational?
- 3 Epistemic Rationality through Simplified Reasoning?



# EXAMPLE 1

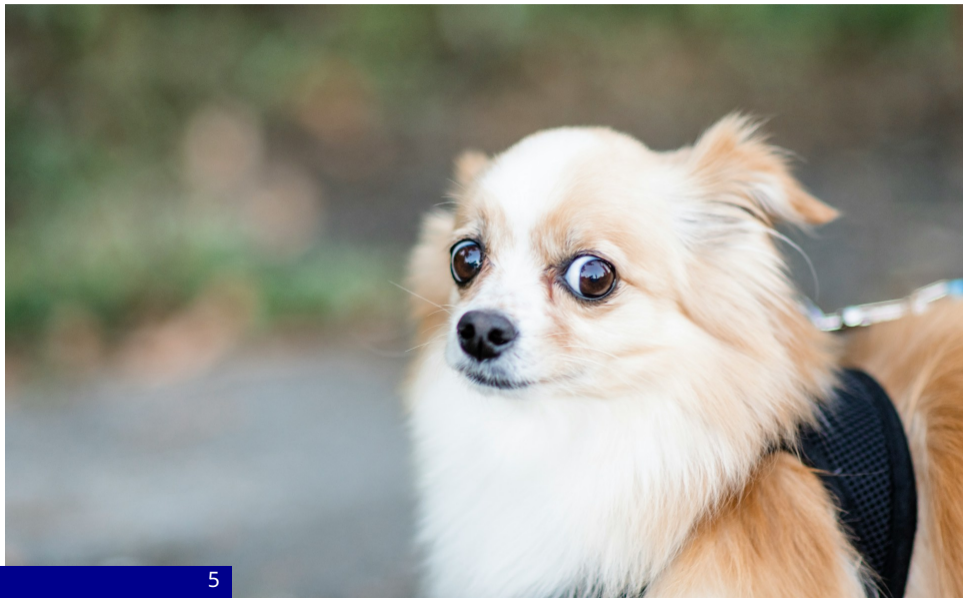
## Plans and bets

Michael is **planning** his day in June in Madrid. He is not certain that it will not rain, but he assumes it won't. If he were instead **betting** 100€ that it will not rain, he will not simply assume it, but consider his credences. But, given Michael's limitations for doing mental math with probabilities, assuming it won't rain usefully **simplifies** his reasoning. <sup>1</sup>

---

<sup>1</sup>(Bratman 1992)

## SOME TERMINOLOGY



## Beliefs and credences

Example: an upcoming dinner party ( $d$ ). Two ways of representing possibility.

- **Belief:** What to think? What to do? Consider what you believe!
  - ▶ *Where will I be at 9PM? or When should I set my alarm? Assume  $d$ !*
- **Credences:** We can be more or less sure of things we believe.
  - ▶ ■  $f: 2 + 2 = 4?$        $\rightarrow$        $c(f) = 1$   
OR  
■  $d?$                        $\rightarrow$        $c(d) = 0.95$
- **Assumption set:**  $\mathcal{S}$  = the set of premises we use to characterize an event of reasoning. Typically, but not necessarily,  $\mathcal{B} = \mathcal{S}$ .

# THE TOPIC OF SIMPLIFIED REASONING

Simplified reasoning works for both:

- What to think? Theoretical.
- What to do? Practical.
- Recent philosophy has not emphasized much on it.
- We can get: unified framework, name explanatory challenges, advance debates over idealization in epistemology.



Cases of simplified elicit in the reader three features:

1. **Unlikelihood:** Agents screen-off what is unlikely **enough**.
2. **Counterfactual:** Intuitively, if more complex reasoning would lead to the **same result**, more advisable to **simplify**.
3. **Stakes:** Simplifying policies are **defeasible**. High stakes justifies more effort.

## Selling points 😊

- We can address the phenomenon of simplified reasoning, itself.
- We can partially systematize the cases.

- Leverage the systematization for a formal (Bayesian) treatment.
- ☰ **Tractability:** A reasoning problem is tractable if it can be solved with reasonable resources (e.g. time and cognitive effort).

### Main Results

1. We can give a **definition** of simplified reasoning in terms of reducing  $S^+$ .
2. Push the formal analysis too far and reach its limit: formally deciding whether to simplify would require to spend the very cognitive resources that simplification is supposed to give. This shows **tractability is key**.
3. **Informal** policy evaluation has to kick in at some point.

## WHY PHILOSOPHERS CARE? (CHAPTER 3)

- Explanatory Challenge: why and how do we treat possibilities as true in reasoning? Literature has focused on whether **Belief** or **Credence** accounts address the challenge.<sup>2</sup>
- Dialectic: **Belief** accounts emphasize on tractability, but **credence** accounts can respond, and argue they can better handle degreed information.
- Believing probabilistic contents can answer the charge on behalf of belief accounts!<sup>3</sup>
- **Problem:** Both type of accounts have reasonable responses to each other's proposals.

---

<sup>2</sup>Dinges (2021), MacFarlane (2023), Palmira (2023), and Staffel (2019).

<sup>3</sup>Moss (2018).

## WHY PHILOSOPHERS CARE? (CHAPTER 3)

- Explanatory Challenge: why and how do we treat possibilities as true in reasoning? Literature has focused on whether **Belief** or **Credence** accounts address the challenge.<sup>2</sup>
- Dialectic: **Belief** accounts emphasize on tractability, but **credence** accounts can respond, and argue they can better handle degraded information.
- Believing probabilistic contents can answer the charge on behalf of belief accounts!<sup>3</sup>
- **Problem:** Both type of accounts have reasonable responses to each other's proposals.

---

<sup>2</sup>Dinges (2021), MacFarlane (2023), Palmira (2023), and Staffel (2019).

<sup>3</sup>Moss (2018).

## WHY PHILOSOPHERS CARE? (CHAPTER 3)

- Explanatory Challenge: why and how do we treat possibilities as true in reasoning? Literature has focused on whether **Belief** or **Credence** accounts address the challenge.<sup>2</sup>
- Dialectic: **Belief** accounts emphasize on tractability, but **credence** accounts can respond, and argue they can better handle degreed information.
- Believing probabilistic contents can answer the charge on behalf of belief accounts!<sup>3</sup>
- **Problem:** Both type of accounts have reasonable responses to each other's proposals.

---

<sup>2</sup>Dinges (2021), MacFarlane (2023), Palmira (2023), and Staffel (2019).

<sup>3</sup>Moss (2018).

## WHY PHILOSOPHERS CARE? (CHAPTER 3)

- Explanatory Challenge: why and how do we treat possibilities as true in reasoning? Literature has focused on whether **Belief** or **Credence** accounts address the challenge.<sup>2</sup>
- Dialectic: **Belief** accounts emphasize on tractability, but **credence** accounts can respond, and argue they can better handle degreed information.
- Believing probabilistic contents can answer the charge on behalf of belief accounts!<sup>3</sup>
- **Problem:** Both type of accounts have reasonable responses to each other's proposals.

---

<sup>2</sup>Dinges (2021), MacFarlane (2023), Palmira (2023), and Staffel (2019).

<sup>3</sup>Moss (2018).

## WHY PHILOSOPHERS CARE? (CHAPTER 3)

- Explanatory Challenge: why and how do we treat possibilities as true in reasoning? Literature has focused on whether **Belief** or **Credence** accounts address the challenge.<sup>2</sup>
- Dialectic: **Belief** accounts emphasize on tractability, but **credence** accounts can respond, and argue they can better handle degreed information.
- Believing probabilistic contents can answer the charge on behalf of belief accounts!<sup>3</sup>
- **Problem:** Both type of accounts have reasonable responses to each other's proposals.

---

<sup>2</sup>Dinges (2021), MacFarlane (2023), Palmira (2023), and Staffel (2019).

<sup>3</sup>Moss (2018).

## WHY PHILOSOPHERS CARE? (CHAPTER 3)

- Explanatory Challenge: why and how do we treat possibilities as true in reasoning? Literature has focused on whether **Belief** or **Credence** accounts address the challenge.<sup>2</sup>
- Dialectic: **Belief** accounts emphasize on tractability, but **credence** accounts can respond, and argue they can better handle degreed information.
- Believing probabilistic contents can answer the charge on behalf of belief accounts!<sup>3</sup>
- **Problem:** Both type of accounts have reasonable responses to each other's proposals.

---

<sup>2</sup>Dinges (2021), MacFarlane (2023), Palmira (2023), and Staffel (2019).

<sup>3</sup>Moss (2018).

## Main Result (Chapter 3)

- Acceptance: sometimes we voluntarily accept what we treat as true.
- The cognitive function of simplified reasoning is plausibly psychologically realized by acceptance.
- Towards a **full account**: all attitudes need to participate in our theory of simplified reasoning.
- Consider: different practical scenarios require that we take into account our beliefs and credences in determining what we treat as true.
- Acceptance can work directly, but we still need beliefs and credences to determine in some cases *why* we accept and how to do it.

- 1 What is Simplified Reasoning?
- 2 How is Simplified Reasoning Rational?
- 3 Epistemic Rationality through Simplified Reasoning?

- Question: Features of reasoning **processes (policies)** make it tractable?
- Normative features of agents who are resourceful make reasoning tractable
  1. they can approximate high value;
  2. they don't waste cognitive resources; and
  3. they oftentimes go for a value of simplification unavailable for complex policies.
- **Guiding idea:** resourceful agents can make the circumstantially-best out of their limited resources. (Cherniak 1992, 1994; Icard 2023)

- Question: Features of reasoning **processes (policies)** make it tractable?
- Normative features of agents who are resourceful make reasoning tractable
  1. they can approximate high value;
  2. they don't waste cognitive resources; and
  3. they oftentimes go for a value of simplification unavailable for complex policies.
- **Guiding idea:** resourceful agents can make the circumstantially-best out of their limited resources. (Cherniak 1992, 1994; Icard 2023)

- Question: Features of reasoning **processes (policies)** make it tractable?
- Normative features of agents who are resourceful make reasoning tractable
  1. they can approximate high value;
  2. they don't waste cognitive resources; and
  3. they oftentimes go for a value of simplification unavailable for complex policies.
- **Guiding idea:** resourceful agents can make the circumstantially-best out of their limited resources. (Cherniak 1992, 1994; Icard 2023)

### The Consequentialist Framework

- Emphasize on the rationality of the reasoning process through reasoning policies.
- Don't evaluate what agents ought to do, evaluate what they are praiseworthy for doing when they are resourceful.
- Not everything goes: Restrict set of permissible reasoning policies using the policies that are success-conducive.
- **Result:** Resource rationality of simplified reasoning is a matter of doing what is circumstantially best.
- **Slogan:** Doing the best we can with the resources we can is praiseworthy, but we need good inputs to our reasoning policies

- 1 What is Simplified Reasoning?
- 2 How is Simplified Reasoning Rational?
- 3 Epistemic Rationality through Simplified Reasoning?**

- Epistemic rationality understood as the purely epistemic reasons we have for holding our attitudes (opinions, beliefs, credences).
- Question 1: are humans sometimes epistemically rational?
- I propose to begin on the assumption that **yes**, we sometimes achieve epistemic rationality.
- Question 2: What role does resource rationality play in our epistemic successes?

### The Constitutive Enabling View of Epistemic Rationality

- Suppose we really sometimes get purely epistemic goods (accuracy, truth, knowledge, etc.) when we reason.
- Plausibly, since we are cognitively limited, we can get epistemic goods thanks to the resourcefulness of simplifying policies.
- Resource-rational simplifying policies *constitutively enable* epistemic rationality: they enable our achievement of epistemic goods.

# TLDR OF THE DISSERTATION

1. We can systematize the recent discussion using Bayesian tools. The limitations shows us a path forward.
2. Future work needs to reach a more general definition that covers simplification of policies directly.
3. The **credences** we have, what **believe** what we **accept**; all those attitudes can play a role in simplified reasoning.
4. **Rationality** of simplified reasoning: it's a matter being **resourceful** when we reason.
5. Epistemological interpretation of the model: we are epistemically rational partly thanks to our rational ways to simplify reasoning.

DANKE!  
THANK YOU!  
MERC!  
GRAZIE!  
GRACIAS!  
DANK JE WEL!

.....



# REFERENCES I



BRATMAN, MICHAEL E. (1992). "**PRACTICAL REASONING AND ACCEPTANCE IN A CONTEXT**". In: *Mind* 101.401, pp. 1–16. DOI:

10.1093/mind/101.401.1.



CHERNIAK, CHRISTOPHER (1992). **MINIMAL RATIONALITY**. 2.print. A Bradford Book. Cambridge, Mass.: MIT Press. ISBN: 978-0-262-53087-3

978-0-262-03122-6.



— (1994). "**PHILOSOPHY AND COMPUTATIONAL NEUROANATOMY**". In: *Philosophical Studies* 73.2-3, pp. 89–107. DOI: 10.1007/bf01207659.



CLARKE, ROGER (2013). "**BELIEF IS CREDENCE ONE (IN CONTEXT)**". In: *Philosophers' Imprint* 13, pp. 1–18.



DINGES, ALEXANDER (2021). "**BELIEFS DON'T SIMPLIFY OUR REASONING, CREDENCES DO**". In: *Analysis* 81.2, pp. 199–207. DOI:

10.1093/analys/anaa084.



HARSANYI, JOHN C. (1985). "**ACCEPTANCE OF EMPIRICAL STATEMENTS: A BAYESIAN THEORY WITHOUT COGNITIVE UTILITIES**". In: *Theory and Decision*

18.1, pp. 1–30. DOI: 10.1007/bf00134075.



ICARD, THOMAS (2023). "**RESOURCE RATIONALITY**". (Visited on 02/01/2024).



MACFARLANE, JOHN (2023). "**BELIEF: WHAT IS IT GOOD FOR?**" In: *Erkenntnis*. ISSN: 0165-0106, 1572-8420. DOI: 10.1007/s10670-023-00716-0.

(Visited on 2023).

## REFERENCES II



MOSS, SARAH (2018). **PROBABILISTIC KNOWLEDGE**. First edition. Oxford, United Kingdom: Oxford University Press. ISBN: 978-0-19-879215-4  
978-0-19-885809-6 978-0-19-251058-7.



PALMIRA, MICHELE (2023). **"REASONING SIMPLIFYING ATTITUDES"**. In: *Episteme*, pp. 1–14. DOI: [10.1017/epi.2023.4](https://doi.org/10.1017/epi.2023.4).



ROSS, JACOB AND MARK SCHROEDER (2014). **"BELIEF, CREDENCE, AND PRAGMATIC ENCROACHMENT"**. In: *Philosophy and Phenomenological Research*  
88.2, pp. 259–288. DOI: [10.1111/j.1933-1592.2011.00552.x](https://doi.org/10.1111/j.1933-1592.2011.00552.x).



STAFFEL, JULIA (2019). **"HOW DO BELIEFS SIMPLIFY REASONING?"** In: *Noûs* 53.4, pp. 937–962. DOI: [10.1111/nous.12254](https://doi.org/10.1111/nous.12254).

- I build on the similarities between previous models.<sup>4</sup>
- Theoretical credences  $\neq$  Practical credences

- ▶ **Domains:**

$$\mathcal{S}^+ = \{p_1, p_2, \dots, p_{k+1}\} \rightarrow \mathcal{S} = \{p_1, p_2, \dots, p_k, \cancel{p_{k+1}}\}$$

- ▶ **Theoretical:**

$$c(p) = x, p \in \mathcal{S}^+$$

- ▶ **Practical:**

$$c(p|\mathcal{S}) = x, p \in \mathcal{S}$$

- We can lever the counterfactual feature to use decision theory.
  - ▶ Decision theory applies to both theoretical an practical reasoning.
  - ▶ Which way of reasoning is best to adopt can be evaluated by asking: what are the best means to pursue our epistemic and practical ends?

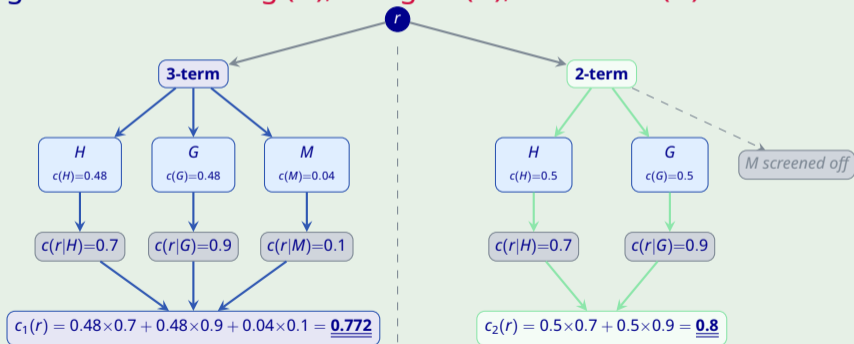
---

<sup>4</sup>Clarke 2013; Harsanyi 1985

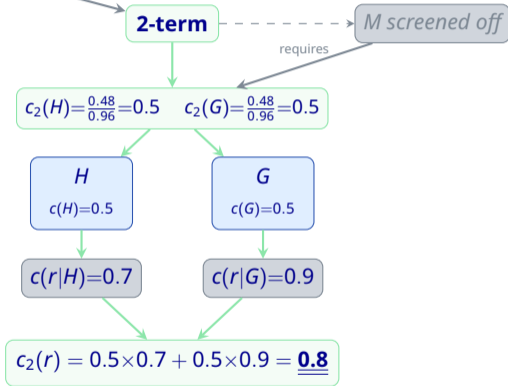
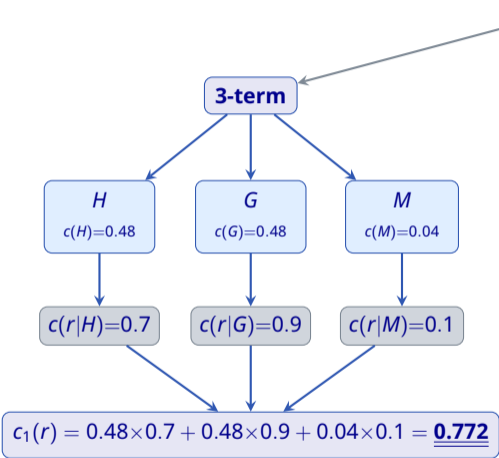
## EXAMPLE 2

### Forecasting

Upcoming event in Hamburg (H), Glasgow (G), or Madrid (G). Forecast rain:<sup>5</sup>



<sup>5</sup>(Ross and Schroeder 2014; Staffel 2019)



# LIMITS OF BAYESIANISM

- I argue that the Bayesian framework is a fruitful starting point to get a plausible characterization of simplified reasoning:

$$\mathcal{S}^+ = \{p_1, p_2, \dots, p_{k+1}\} \rightarrow \mathcal{S} = \{p_1, p_2, \dots, p_k, \cancel{p_{k+1}}\}$$

- In fact, the Bayesian framework points towards its own limitations, since it allows us to formulate a norm on rational simplification.
- Argument: It is possible to formally compute what you **Gain** in reasoning simpler and what you **Lose** in not being as accurate as possible. But if you do, you give up the gains in advance, so a Bayesian analysis can't constrain agents by requiring them to be guided by these formal computations.
- Non-Self Defeat Norm: For any particular reasoning task T and any algorithm that the agent is executing to solve it, formal computations of **Gains** and **Losses** are impermissible.

## Limitations

- **Offstage:** direct simplification of plans, preferences, or reasoning policies.
- $S$  looks like a middleman: real simplification isn't always reached through elimination of epistemic possibilities.
- 🕒 Future work: Can we directly talk about simplified reasoning policies?

## FORMAL RATIONALITY LINK

⊗ **The Link.** With  $\Pi$  the set of available policies ( $|\Pi| > 2$ ),  $\pi$  the full-information policy,  $\pi'$  a simplifying policy, and  $\pi^* = \arg \max_{\Pi} V$ :

$$V(\pi') > V(\pi) \implies \pi' = \pi^*.$$

☹ **Problem.** Global reading of  $\pi^*$ :  $V(\pi') > V(\pi)$  entails only  $\pi \neq \pi^*$ , not  $\pi' = \pi^*$ . Reading  $\pi^*$  makes the conclusion trivial, and I lose *Rationality Link*, which is what matters for me.

### 🔧 **Proposed Repair.**

The best reasoning policy at a situation is not the one that reaches a *global* optimal net value. Simplified policies can be restricted to a smaller set of rationally permissible policies that reach a satisfactory net value. The framework would not deliver true optimality, but only high value in specific reasoning situations within a set of satisfactory policies.