A Hybrid Approach to Rational Norms
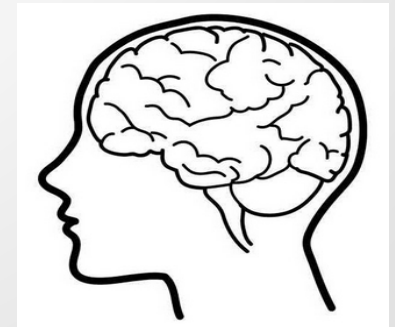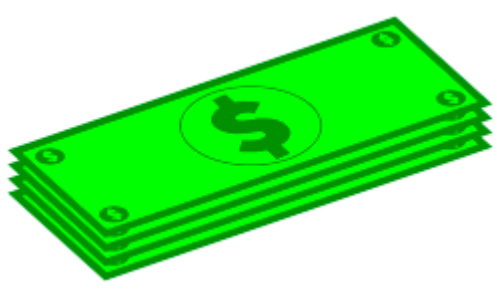
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Workshop on Rationality, Probability, and Pragmatics

May 27th 2016 – Berlin

Motivation

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- Wason's selection task:

Motivation

- Linda Problem

  P("Linda is a bank teller and active in the feminist movement")

  >
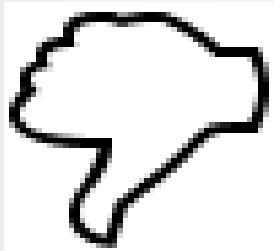
  P("Linda is a bank teller")

Example: The Allais Paradox

A. £1 million for sure

B. £1 million * 89%, £5 million * 10%, nothing * 1%

C. £1 million * 11%, nothing * 89%

D. £5 million * 10%, nothing * 90%

Example: The Allais Paradox

Lottery	89%	10%	1%
A.	£1M	£1M	£1M
B.	£1M	£5M	0
C.	0	£1M	£1M
D.	0	£5M	0

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"Rationality Wars": Two Approaches

- The *Traditional Axiomatic Approach* defines rationality in terms of abstract axioms.

- *Ecological Rationality* defines rationality as the expected performance of a process relative to a particular context

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Rendering Evaluations of Rationality

- The Traditional Axiomatic Approach:
  - Identify the (broad) domain you're in
  - Take an observational record
  - Check against the domain's axioms
  - Rational $\leftrightarrow$ conform to axioms

Rendering Evaluations of Rationality

- The Ecological Approach:
    - Identify processes and contexts of interest

    - Fix context and compare processes

    - Fix process and compare performance across contexts

    - Better (expected) performance ↔ more Eco-Rational

Rendering Evaluations of Rationality

- But rationality judgments are value judgments.

- Where do the values come from?

- How are they justified?

Rendering Evaluations of Rationality

- The Traditional Axiomatic Approach:
    - Domains set goals
    - Value implicit in axioms
    - Representation theorems prove that axioms capture the intended value

Rendering Evaluations of Rationality

- The Ecological Approach:

    More Eco-rational

    $\leftrightarrow$

    better performance   … accurate?

    $\leftrightarrow$

    more **"fast, frugal, and accurate"**

Generating Practical Guidance

Desiderata	Axiomatic approach	Ecological approach
Simple, relatively objective rationality tests		
Directly actionable results		
Generalizable results		

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Generating Practical Guidance

Desiderata	Axiomatic approach	Ecological approach
Simple, relatively objective rationality tests	• Behavior is easily observed • Conformity to axioms is yes/no	:(
Directly actionable results	:(	• People can implement processes • We can teach processes
Generalizable results	• Axioms apply to all people equally	• *Expected* outcomes of processes not distorted by luck

A Hybrid Approach

- Approaches have complementary advantages

- We can combine them into a hybrid approach to harness these advantages:

  - Simulate processes

  - Test with axioms

Further Defense of Axioms

- Axioms are sometimes criticized for having limited applicability or too many preconditions, but:

    - The solution may be more axioms, not fewer!

    - Map axioms to contexts

    - Yields general principles and context-sensitivity

    - Expands domain of our rationality judgments

Conclusions

- The hybrid approach:
  - Allows us to evaluate *strategies* for choice and inference.
  - Provides clear empirical criteria of rationality, and in particular a way to judge the "accuracy" of processes.
  - And how else could we achieve these important desiderata?

Conclusions

"You don't turn to logic to prove that the tree you see over there is larger than the one over here … But sometimes there is no 'tree' … For example, a story told by someone usually offers no empirical criterion for its truth. Then, we can evaluate it by referring to the coherence of the story."

– K. Hammond, *Beyond Rationality*

Thanks for your attention.

Questions or comments?

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