# On the illegitimate roles of values
# when experts reason and report

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# Goal, strategy, thesis

Main question. What are the illegitimate roles of values in expert reasoning and reporting?

Research strategy. Build a simple decision-theoretic model to assess various answers

$+$ Clear adequacy assessment
$-$ Model-to-world gap

Thesis.

Negative phase. Against three proposals
Constructive phase.

❶ Lossy VS lossless information processing
❷ Limits to legitimate use of values for each type

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Introduction

Why experts?

Model of
reporting

Three
proposals

Truth only

Indirect only

Priority to epistemic

Lossy/lossless

Conclusion

References

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# Why have experts
## Social function and its consequence

## Division of epistemic labor: saving on resources

- Information collection and processing
  - $+$ greater speed and reliability by training
- Selected information in simple reports
  - $+$ streamline decision

## Consequence

- Lossy information compression in reporting

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Introduction

Why experts?

Model of
reporting

Three
proposals

Truth only

Indirect only

Priority to epistemic

Lossy/lossless

Conclusion

References

# Lossy compression and reporting
### A toy model

## Building blocks

- Possible states of the world:
    - $\mathbf{W} = \{S, \neg S\}$
- Possible expert reports:
    1. $R =$ '$S$ is the case'
    2. $\neg R =$ '$S$ is not the case'
- Outcomes $O$
- Belief state of the expert: $p_S$
- Value function over $O$: $V(O)$

|        | $S$        | $\neg S$        |
| ------ | ---------- | --------------- |
| $R$    | $O_{R,S}$  | $O_{R,\neg S}$  |
| $\neg R$ | $O_{\neg R,S}$ | $O_{\neg R,\neg S}$ |

Restating the issue: $p_S \in [0, 1] \to \{R, \neg R\}$

- Known canons of epistemic adequacy and rationality
- Which canons for moral adequacy?

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Introduction

Why experts?

Model of
reporting

Three
proposals

Truth only

Indirect only

Priority to epistemic

Lossy/lossless

Conclusion

References

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# Illegitimate role of values?

### 1- Against non-epistemic concerns

## The principle

'Aim only at one good: truth'

|       | $S$          | $\neg S$          |
|-------|--------------|-------------------|
| $R$   | $O_{R,S}$    | $O_{R,\neg S}$    |
| $\neg R$ | $O_{\neg R,S}$ | $O_{\neg R,\neg S}$ |

## Implication for the value function and the choice

- Only relevant property of $O$: truth

$$V(O_{R,S}) = V(O_{\neg R,\neg S}) > V(O_{\neg R,S}) = V(O_{R,\neg S})$$

- Decision rule:

$$\text{If } p_S > .5, \text{ pick } R, \text{ else } \neg R.$$

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Introduction

Why experts?

Model of
reporting

Three
proposals

Truth only

Indirect only

Priority to epistemic

Lossy/lossless

Conclusion

References

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# Illegitimate role of values?

1- Against non-epistemic concerns (continued)

Decision rule

If $p_S > .5$, pick $R$, else $\neg R$.

|        | $S$        | $\neg S$        |
|--------|------------|-----------------|
| $R$    | $O_{R,S}$  | $O_{R,\neg S}$  |
| $\neg R$ | $O_{\neg R,S}$ | $O_{\neg R,\neg S}$ |

## Simple example with unappealing prescription

|                 | Harmless vaccine | Harmful vaccine |
|-----------------|------------------|-----------------|
| Positive report | T & 100 %        | F & ∼50 %       |
| Negative report | F & 99 %         | T & 99 %        |

- Risk the life of 49 % of the population as soon as

$$Probability(\text{Harmless}) > .5$$

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Introduction

Why experts?

Model of
reporting

Three
proposals
Truth only
Indirect only
Priority to epistemic

Lossy/lossless

Conclusion

References

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# Illegitimate role of values?

### 2- Against consequentially direct role

SCIENCE, POLICY, and the
VALUE-FREE IDEAL
HEATHER E. DOUGLAS
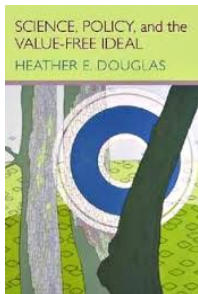
### Beyond epistemic concerns

"[S]cientists should consider the potential
social and ethical consequences of error in their
work, [...] they should weigh the importance of
those consequences, and [...] they should set
burdens of proof accordingly."

Douglas (2009, 87); following Rudner (1953)

Illegitimate? (consequential interpretation; Elliott 2013)

Indirect role: Consider "unintended consequences associated
with mistakes that they want to avoid"

X Direct role: Consider "intended outcomes that they want to
bring about"

# Illegitimate role of values?
2- Against consequentially direct role (continued)

## Implications for value function

|     | $S$        | $\neg S$        |
|-----|------------|-----------------|
| $R$ | $O_{R,S}$  | $O_{R,\neg S}$  |
| $\neg R$ | $O_{\neg R,S}$ | $O_{\neg R,\neg S}$ |

- Allowed $V(O_{\neg R,S}) \neq V(O_{R,\neg S})$;
- But always $V(O_{R,S}) = V(O_{\neg R,\neg S})$.

## Intuitively plausible for the previous example

|                 | Harmless vaccine | Harmful vaccine |
|-----------------|------------------|-----------------|
| Positive report | T & 100 %        | F & ~50 %       |
| Negative report | F & 99 %         | T & 99 %        |

## But unappealing for other cases

|                 | Effective vaccine | Ineffective vaccine |
|-----------------|-------------------|---------------------|
| Positive report | T & 100−ε %       | F & 10−ε %          |
| Negative report | F & 10 %          | T & 10 %            |

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Introduction

Why experts?

Model of
reporting

**Three
proposals**
Truth only
Indirect only
Priority to epistemic

Lossy/lossless

Conclusion

References

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# Illegitimate role of values?

3- For a priority to epistemic values

## The principle

Non-epistemic values can influence decision only if "epistemic values fail to indicate a unique best option" (Steel and Whyte, 2012, 170).

## Implication for the decision rule

Pick $R$ if $\begin{cases} p_S > .5 \text{ or} \\ p_S = .5 \text{ \& } V(O_{R,S}) + V(O_{R,\neg S}) > V(O_{\neg R,S}) + V(O_{\neg R, \neg S}) \end{cases}$

else $\neg R$.

## Unappealing as soon as $p_S \neq .5$

|                  | Harmless vaccine | Harmful vaccine |
|------------------|:----------------:|:---------------:|
| Positive report  | T & 100 %        | F & ~50 %       |
| Negative report  | F & 99 %         | T & 99 %        |

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Introduction

Why experts?

Model of reporting

**Three proposals**
Truth only
Indirect only
Priority to epistemic

Lossy/lossless

Conclusion

References

# Illegitimate role of values?
### Sum up of negative phase

## Rejected proposals for lossy reporting

1. Against non-epistemic concerns
2. Against a consequentially direct role
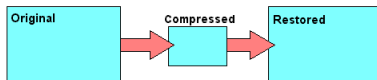3. For a priority to epistemic concerns

*Now to the positive phase.*

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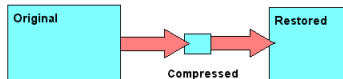SHERBROOKE

# Lossy VS lossless information processing

A proposal

## Information processing

- Lossy processing such as reporting
- Lossless processing such as explicit deduction and Bayesian updating



Analogy with file compression
(source: www.yourdictionary.com)

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Introduction

Why experts?

Model of
reporting

Three
proposals

Truth only

Indirect only

Priority to epistemic

**Lossy/lossless**

Conclusion

References

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# Lossy VS lossless information processing
## A proposal (continued)

## Principle when lossless processing

- Only epistemic concerns

## Why?

- Breaking the rules of deductive or inductive logic would clash with rationality requirements

*Side remark*: Link to logical interpretation of direct role (Elliott, 2013)

- Douglas (2008) claims that non-epistemic values "should not provide warrant for a claim."

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Introduction

Why experts?

Model of
reporting

Three
proposals

Truth only

Indirect only

Priority to epistemic

Lossy/lossless

Conclusion

References

# Lossy VS lossless information processing
## A proposal (end)

## Principle for lossy processing

- Include non-epistemic concerns for all outcomes $O$ and all degrees of belief $p_s$ in the general decision rule:

  Pick $R$ if
  $$p_S[V(O_{R,S}) - V(O_{\neg R,S})] > p_{\neg S}[V(O_{\neg R, \neg S}) - V(O_{R, \neg S})],$$
  else $\neg R$.

- Additional conditions to avoid illegitimate non-epistemic concerns:
  - Reliance on established norms
  - Publicity of reasons for choices
  - "The health of my patient will be my first consideration" (Physician's Oath)

# Conclusion

## Question
What are the illegitimate roles of non-epistemic values when experts process information?

## The relevant distinction
Lossless VS lossy information processing

For lossless cases. Against the influence of non-epistemic concerns

For lossy cases. More room for non-epistemic concerns than Douglas and Steel are ready to grant.

## Thanks!

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Introduction

Why experts?

Model of
reporting

Three
proposals

Truth only

Indirect only

Priority to epistemic

Lossy/lossless

Conclusion

References

# References

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