The veritistic value of controversial argumentation
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Mill on controversy

“Complete liberty of contradicting and disproving our opinion, is the very condition which justifies us in assuming its truth for purposes of action; and no other terms can a being with human faculties have any rational assurance of being right.” [Mill, 2009, p. 60]

Three Millean theses on the veritistic value of controversy

1. In controversial debates, proponents approach the truth in the long run. The more critical the argumentation, the more rapid proponents track down the truth.
2. The stability of proponent positions indicates their verisimilitude even at low inferential densities. This veritistic indicator becomes more accurate in highly critical debates.
3. The degree of justification of partial proponent positions indicates their verisimilitude at low inferential densities. The accuracy of this indicator depends on the argumentation strategy pursued by the proponents.

A formal model of debate dynamics

- A state of a debate
  - Sentence pool $|S| = 2n$
  - Position of proponent $i$ $P_i^t = S \rightarrow \{T, F\}$
  - Dialectical structure $\tau_1 = (T_1, A_1, U_1)$
- Debate dynamic
  - Argument construction $\tau_t \rightsquigarrow \tau_{t+1}$
  - Update mechanism $P_i^t \rightsquigarrow P_{i+1}^t$
- Initial conditions
  - Arbitrary truth value assignment designated as correct; random proponent positions; no arguments
Key concepts

- A position is **dialectically coherent** iff there is no argument whose premises the position considers true while assigning the truth-value false to its conclusion.
- **Inferential density** of dialectical structure:
  \[ D(\tau) := n - \frac{\log(\sigma_\tau)}{\lambda_\tau} \]
  (\( \sigma_\tau \): number of complete & coherent positions)
- **Verisimilitude** of proponent position:
  proportion of correct truth-value assignments
- **Degree of justification** of a partial position relative to a dialectical structure:
  \[ D\text{OJ}_\tau(p) = \frac{\sigma_\tau(p)}{\sigma_\tau} \]
  - explication of pre-theoretic notion; degrees of justification satisfy, under certain conditions, the probability axioms.

Set up of the debate simulations

<table>
<thead>
<tr>
<th>Type</th>
<th>( \tau_t \leadsto \tau_{t+1} )</th>
<th>( P_{t_s} \leadsto P_{t_{s+1}} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>randomly chosen premises and conclusion</td>
<td>closest coherent</td>
</tr>
<tr>
<td>2</td>
<td>maximal critique (proponent chooses conclusion and premises of new argument so that number of opponents who disagree with conclusion and agree with premises is maximal)</td>
<td>closest coherent</td>
</tr>
</tbody>
</table>

- new arguments never render the truth incoherent
- two ensembles with at least 1,000 debate simulations

Mean verisimilitude evolution

Stability as veristic indicator (\( D=.15 \))