

# 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]

2

## Three Milleian 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.

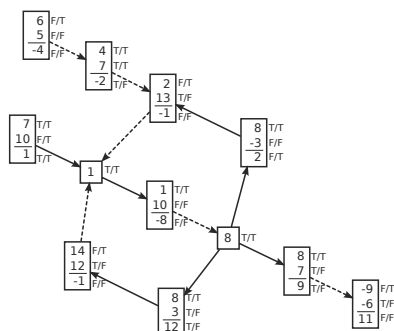
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## A formal model of debate dynamics

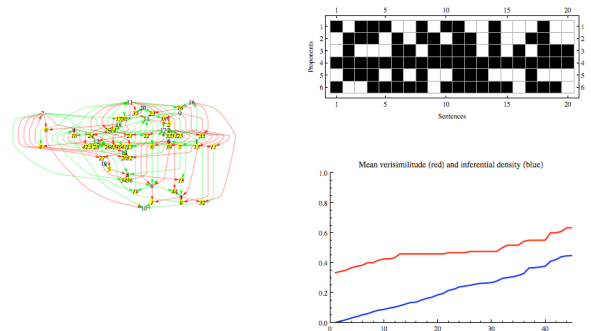
- A state of a debate
  - Sentence pool  $|S| = 2n$
  - Position of proponent  $i$   $\mathcal{P}_t^i = S \rightarrow \{T, F\}$
  - Dialectical structure  $\tau_t = \langle T_t, A_t, U_t \rangle$
- Debate dynamic
  - Argument construction  $\tau_t \rightsquigarrow \tau_{t+1}$
  - Update mechanism  $\mathcal{P}_t^i \rightsquigarrow \mathcal{P}_{t+1}^i$
- Initial conditions
  - Arbitrary truth value assignment designated as correct; random proponent positions; no arguments

4

## A formal model of debate dynamics



5



6

## Key concepts

- A position is **dialectically coherent** iff there is no argument whose premisses the position considers true while assigning the truth-value *false* to its conclusion.

- Inferential density** of dialectical structure:

$$D(\tau) := \frac{n - \lg(\sigma_\tau)}{n}$$

( $\sigma_\tau$ : 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:

$$\text{DOJ}_\tau(\mathcal{P}) = \frac{\sigma_\tau(\mathcal{P})}{\sigma_\tau}$$

- explication of pre-theoretic notion; degrees of justification satisfy, under certain conditions, the probability axioms.

7

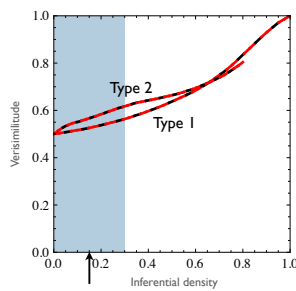
## Set up of the debate simulations

| Type | $\tau_t \rightsquigarrow \tau_{t+1}$  | $\mathcal{P}_t^i \rightsquigarrow \mathcal{P}_{t+1}^i$ |
|------|---|--|
| 1    | randomly chosen premisses and conclusion  | closest coherent                                       |
| 2    | maximal critique<br>(proponent chooses conclusion and premisses of new argument so that number of opponents who disagree with conclusion and agree with premisses is maximal) | closest coherent                                       |

- new arguments never render the truth incoherent
- two ensembles with at least 1.000 debate simulations

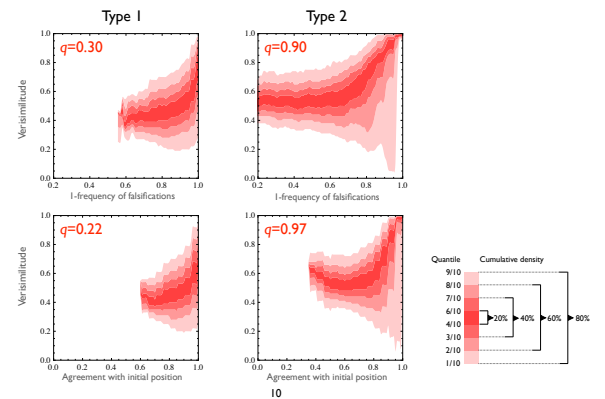
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## Mean verisimilitude evolution



9

## Stability as veritistic indicator ( $D=.15$ )



10

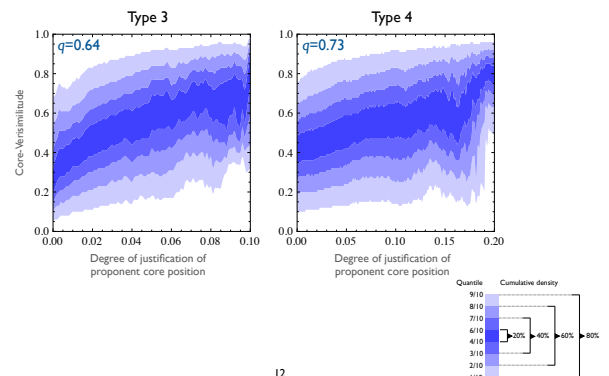
## Set up of the debate simulations

| Type | $\tau_t \rightsquigarrow \tau_{t+1}$   | $\mathcal{P}_t^i \rightsquigarrow \mathcal{P}_{t+1}^i$      |
|------|--|---|
| 3    | randomly chosen premisses and conclusion   | lexicographic closest coherent<br>(priority of core claims) |
| 4    | maximally robust argumentation<br>(new argument maximises the degree of justification) | lexicographic closest coherent<br>(priority of core claims) |

- new arguments never render the truth incoherent
- two ensembles with at least 1.000 debate simulations

11

## Degree of justification as veritistic indicator ( $D=.15$ )



12