

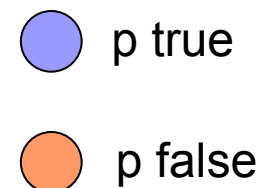
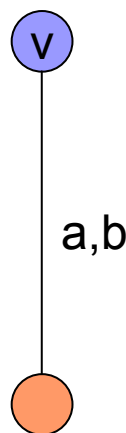
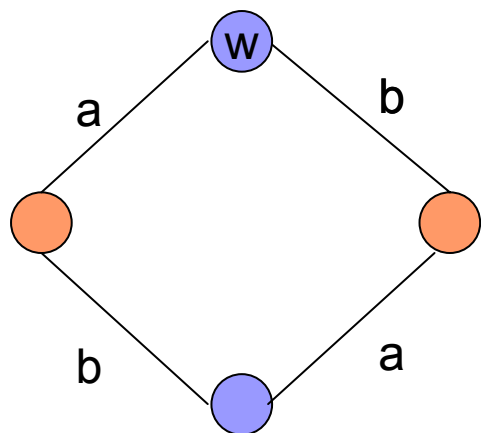


# Natural Models for Epistemic Semantics

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# Specific problems



- No unique model for one and the same “epistemic situation” (not even up to bisimulation).
- No bisimulation invariance.
- No supervenience.
- Distributed knowledge in terms of information states  
≠  
Distributed knowledge in terms of knowledge sets.

# General problem / consideration

- Epistemic logic can only deal with the factual and higher order knowledge of a group of agents about those aspects of a situation that are captured by the formal language that is used to describe that situation.
- Equivalently, epistemic logic only deals with knowledge about the sentences of the formal language that is used.

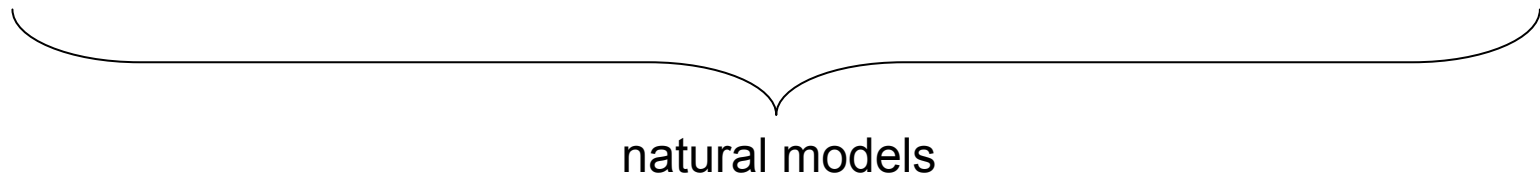
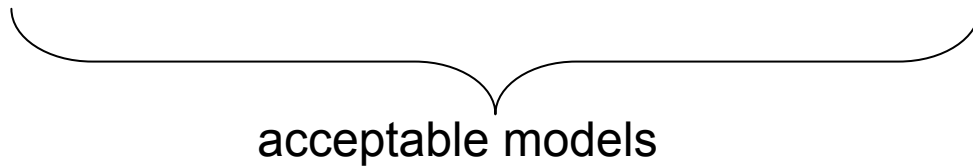
# Consequences

“All an agent knows” in  $(M,w)$  is  $\text{Know}_a(M,w) = \{ \varphi \mid (M,w) \text{ satisfies } [a] \varphi \}$ .

Tightness

Modal Saturation

Non-redundancy



Naturalness = modal saturation + non-redundancy

A model is natural if and only if it is isomorphic to a generated sub-model of the canonical model.

# Further work

- Distributed knowledge in **dynamic** epistemic logic. Previously unclear due to bisimulation variance.
- Dynamic notions of distributed knowledge. What knowledge can be established by a group of agents **through communication**?
- Group structure: communication **networks**.

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