

AGM

Paradigm approach to belief revision named after E. Alchourròn, P. Gärdenfors, D. Makinson (1985: On the logic of theory change: Partial meet contraction and revision functions. *Journal of Symbolic Logic*, 50:510-530). AGM axiomatically models the change of a fully believed, consistent and deductively closed set of sentences (aka. theory), K , in response to new information, p , which is inconsistent with the set. To yield structure over the belief set, an entrenchment order, \leq , specifies a belief's comparative retractability. This notion is based exclusively on logical properties of sentences (derivability). It serves to formalize a minimal change revision strategy as the contraction of the least entrenched belief, q , deletion of which allows a consistent expansion with p .

See also: non-monotonic logic, dynamic logic, set, set theory

Deduction

Deduction can be characterized as necessary inference. It is widely, though not universally, accepted that deduction is a transition from (at least one) premise(s) to a conclusion, such that it is impossible for the former to be (jointly) true and the conclusion false. However, false premises can lead in a deductively valid way to a true conclusion, e.g., Napoleon was Indian; All Indians are conquerors \therefore Napoleon was a conqueror – constituting an unsound argument. Validity of deductive arguments is widely taken to depend exclusively on logical relations between sentences, rather than substantive relations between the contents they express. Importantly, the content of the conclusion of a deductively valid argument is uninformative relative to the content of the premise-set (cf. induction). Hence, in a deductive argument, one cannot (i) *increase* the (informational) content of the conclusion above that of the premise-set; nor (ii) *decrease* said content by adding more restrictive premises: If A implies B , then $A \& C$ still implies B (monotony), nor (iii) *order* premises according to their contents' importance: Should premises believed to be true deductively imply a false conclusion, then – logically – each premise is equally revisable (cf. scientific laws vs. initial conditions); nor (iv) *validate* premises by means of a true conclusion which is deductively implied (cf. the fallacy of affirming the consequent).

See also: inference rules of, syllogism, tautology, validity, soundness, monotony

Dilemma

Situation in which one of two propositions must be true, each of which yields the same unattractive consequence. Generalizes to: tri-, tetra-, polylemma. Formally: $A \vee B, A \rightarrow C, B \rightarrow C \therefore C$. The conditional premises are called the horns of the dilemma. "Escaping between the horns" amounts to denying the disjunction by showing a third alternative that does not yield the undesired consequence. "Taking it by the horns" amounts to denying at least one of the conditionals. In distinction to a false dilemma (fallacy), both strategies will not succeed in the case of a real dilemma.

See also: inference rules of, disjunction, fallacies

Reference as

Zenker, F. (2008a). Entries: AGM; Deduction; Dilemma. In: Russo, F. & J. Williamson (eds). *Key Terms in Logic*. London: Continuum Books (forthcoming).