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★Logic and conditional probability.

A synthesis.

Studies in Logic (London), 69.

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Publisher's description: "This monograph develops an algebra of Boolean *fractions*, (a|b)—ordered pairs of propositions or events—'a if b', 'event a given event b'. In nine chapters, the author shows that these conditional propositions (together with their associated instantiations or models):

Provide logical elements that better represent and more faithfully facilitate manipulation of certain and uncertain *conditional* information

Extend the Boole's algebra of 2-valued statements to a 3-valued system that includes '*inapplicable* statements'—those whose condition may be false in some or all instances (examples, cases, models...)

Allow a *definition* of the probability of an arbitrary Boolean proposition

Non-trivially combine Boolean logic with standard conditional probability theory

Provide a complete and adequate development of the crucial 4th operation for Boolean logic, namely *conditioning*, including iterated conditioning

Provide an expanded theory of deduction defined in terms of the extended operations on the Boolean fractions

Admit a variety of deduction relations, and that the deductively closed sets generated by some initial set of conditionals can be calculated

Extend the ordinary function operations of sum, difference, product & quotient to real-valued functions with possibly different or overlapping domains of definition

Represent & simplify complex conditional statements in Bayesian expert systems used to calculate *maximum information entropy* solutions

Explicate the logic of quantum measurements by better expressing the changing conditions in quantum mechanics."