

## ESCAPING TRIVIALITY

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*Abstract:* One way to interpret the triviality results proved by David Lewis<sup>1</sup> is that there can be no consistent mapping of the probability calculus into first-order logic. If the axioms of the probability calculus are assumed alongside truth-functionality for the standard conditional operator, then it is not the case that in a regular distribution of probability there is a proposition C equivalent to the material conditional  $a \rightarrow b$  such that  $p(C)$  equals the conditional probability of  $b/a$  i.e.  $b$  (given  $a$ ), except for trivial languages. Several strategies have been proposed to escape this result; this paper offers an assessment and endorsement of a strategy, first proposed by Adams<sup>2</sup> and later developed by Skyrms<sup>3</sup>, the upshot of which is that the assertion of conditionals does not go by their probability of truth since truth values are non-applicable for conditionals.

*Keywords:* triviality, conditionals, probability.

### I. INTRODUCTION

At least going back to Frank Ramsey's "Truth and Probability"<sup>4</sup>, there has been an interest in establishing a connection between first-order logic (the logic of certainty / the logic of full belief) and the probability calculus (or the logic of uncertainty / the logic of partial belief). This line of thought is founded on a

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<sup>1</sup> Lewis, D. K. (1976). "Probabilities of Conditionals and Conditional Probabilities", *The Philosophical Review*, Vol. 85, No. 3, pp. 297-315;

<sup>2</sup> Adams, E. W. (1966). "Probability and the Logic of Conditionals" in Hintikka, J. and Suppes, P. (eds.), pp. 256-316, "The Logic of Conditionals", (1975), "A Primer of Probability Logic", (1988);

<sup>3</sup> Skyrms, Brian (1980). "Causal Necessity", "Pragmatics and Empiricism", (1984);

<sup>4</sup> Ramsey, F. P. (1950). "Truth and Probability" in *The Philosophy of Mathematics and other Logical Essays*