Looking at conditionals within the possibilistic framework

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Abstract. Conditionals play a key role in different areas of logic, probabilistic and non-monotonic reasoning, and they have been studied and formalised from different angles. In this talk we will focus on recent developments on various foundational aspects of conditionals related to the possibilistic model of uncertainty. We will first show that a suitable notion of conditional possibility, for which a triviality result similar to Lewis' in the probabilistic setting can be proved, is fully compatible with an algebraic setting of Boolean algebras of conditionals in the sense that an analogue of Stalnaker's Thesis holds. On the other hand, we will argue that the approach to conditionals as random quantities by Gilio, Sanfilippo and colleagues, based on de Finetti's notion of conditional as a three-valued object and shown to be compatible with the above Boolean algebraic setting, admit a faithful possibilistic counterpart. In that approach, conditionals are interpreted as possibilistic variables instead, and their possibilistic expectation provides a means of extending a possibility on plain events to arbitrary (compound) conditionals. Finally, if time permits, we will also discuss recent results regarding Lewis-Stalnaker conditionals, formalized in Lewis's logics C1 and C2, their algebraic characterization, and a possibilistic imaging update rule that avoids the triviality result, so that the (plain) possibility of these conditionals is nothing but their imaged possibility.

This presentation is based on the below joint works with a number of colleagues.

References

1. Flaminio, T., Gilio, A., Godo, L., and Sanfilippo, G.: Compound Conditionals as Random Quantities and Boolean Algebras. KR 2022.
2. Flaminio, T., and Godo, L.: Conditional Objects as Possibilistic Variables. ECSQARU 2023.
3. Flaminio, T., Godo, L., and Hosni, H.: Boolean algebras of conditionals, probability and logic. *Artificial Intelligence*, 2020.
4. Flaminio, T., Godo, L., and Rosella, G.: Possibility of Conditionals and Conditional Possibilities: From a Triviality Result to Possibilistic Imaging. KR 2024.
5. Flaminio, T., Godo, L., and Ugolini, S.: Canonical Extension of Possibility Measures to Boolean Algebras of Conditionals. ECSQARU 2021.