Why Coherence Is Not Relative Set-Theoretic Overlap

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Coherence is the property of propositions hanging or fitting together. Intuitively, adding a proposition to some given set of propositions should result in the following three alternatives: (i) an increased, (ii) an unchanged, or (iii) a decreased degree of coherence. In this talk I show that probabilistic coherence measures based on relative set-theoretic overlap are in conflict with this intuitive verdict. More precisely, it can be proven that (i) according to the naive overlap measure of coherence by Glass (2002) and Olsson (2002) it is impossible to increase a set's degree of coherence by adding propositions and that (ii) according to the refined overlap measure of coherence by Meijs (2006) no set's degree of coherence can exceed the degree of coherence of its maximally coherent subset which can only be a two-element set. It can also be shown that this result carries over to all other subset-sensitive refinements of the naive overlap measure based on variations of the employed weighting procedure. As these two results stand in sharp contrast to elementary coherence intuitions which were also shown by Koscholke and Jekel (2015) to have an empirical foundation, I conclude that coherence cannot be measured in terms of relative set-theoretic overlap.

References

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