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# Nonmonotonicity and Compatibility Relations in Belief Structures

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**Abstract**

We concern ourselves with the situation in which we use the Dempster-Shafer belief structure to provide a representation of a random variables in which our knowledge of the probability distribution is imprecise. We discuss the role of compatibility relations as a means of enabling inference about one variable, the secondary variable, based upon knowledge about another variable, the primary. We define monotonicity as a condition in which an increase in information about the primary variable in an inference should not result in a decrease in information about the secondary variable. We show what are the conditions required of a compatibility relation to lead to monotonic and nonmonotonic inferences. We provide some examples of non-monotonic relations.

*For technical reasons, this article is stored as two separate computer files, labelled "Part I" and "Part II", respectively. Please replace the present page by a printout of the "Part II" file.*