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Order Effects in Probabilistic Reasoning Potentialities and Limits of Modeling Methods

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Abstract: A well-known phenomenon in sequential reasoning processes is that the order of information (congruent/incongruent with certain hypotheses) influences the assignment of probabilities to hypotheses and in turn, judgments of them. For instance, order effects are known to have severe consequences in medical diagnosis and tactical military decision making (Chapman et al., 1996; Zhang et al., 1998). Hogarth and Einhorn (1992) Belief-Adjustment Model (BAM) describes cognitive mechanisms that result in different types of order effects and precise predictions of probabilities can be derived. In the present study BAM model was contrasted with a Bayes net (Pearl, 1988) model that predicts competing probabilities for the experiment in which participants estimated the probabilities of hypotheses during the reasoning process. Results show, that both models predict different parts of the same data. Overall, the fit is not sufficient and we conclude that order effects can be explained by an interaction of several cognitive processes.