Three-levels of Analysis: Connecting cognitive theories of reasoning with empirical results and cognitive modeling

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Summary

A recent increase in theories of human reasoning shows the need to evaluate these theories. While some properties like non-monotonicity can be evaluated theoretically other properties can be evaluated empirically only: For instance the ability to predict quantitative differences in error rates, reponse times, and physiological correlates like eye-movement and brain activations.

In this talk, I will focus on spatial reasoning and introduce a computational model implying a cognitive complexity measure. In a second step, this model will be evaluated on current empirical results. This raises the question of how well these cognitive models can predict human behavior and the associated cognitive difficulty. Moreover, there is the demand to examine these models on their cognitive adequacy for physiological correlates such as eye movements and brain activations. The goal is to have cognitive computational models that can form a bridge to psychology and neuroscience at the same time.