A Cognitive Assistant for Improving Human Reasoning Skills

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Highlights

- In this work, a cognitive assistant was presented that was designed to improve skills for a selection of core reasoning tasks. Although it did not have astonishing success in all the tasks, maybe because Wason's Selection Task and Bayesian reasoning are both very complicated concepts to teach, it did show very satisfying results with the other tasks. The cognitive assistant was clearly more effective than an online course on the same skills, proving its worth as a mentor. Especially having in mind that participants only spent roughly 30 minutes talking to it, it can clearly be viewed as a success.

- We can conclude that performance on solving certain reasoning tasks can indeed be improved with the help of pedagogical cognitive assistant, which is especially fortunate as there are not many teachers in this area, despite its importance for arguably everybody's personal life. Of course, the presented agent is only a prototype developed by a single person and could be improved and extended in many ways, as is described in the following section. Nevertheless, it may be seen as a small hint in the right direction for the application of cognitive assistant's technologies to education about reasoning and rationality.

- This article contributes to the community of cognitive assistants two-fold: 1) a dialog-based cognitive assistant for improving human reasoning skills, which is able to adapt to individual performance of the student has been proposed and realized; 2) Over sixty different reasoning tasks and their necessary data (complete with explanations, associated small talk, hints, evaluations etc.) adopted from research in psychology have been integrated in the cognitive assistant, which has been empirically evaluated and confirmed that the cognitive assistant yields higher learning gains than a comparative non-interactive environment.