

A Cognitive Analysis Model for Complex Open-ended Analogical Retrieval

Junya Morita (morita@cog.human.nagoya-u.ac.jp)

Abstract

Although many cognitive models have successfully simulated the results of controlled psychological experiments, few researchers have attempted to apply their models to complex, realistic phenomena. In this study, MAC/FAC (“many are called, but few are chosen”), which models two stages of analogical reasoning [Forbus, 1995], was applied to our experimental data. In our experiment, subjects were presented a cue story (Figure 1) and asked to retrieve cases learned from everyday life. Next they rated the goodness as an analogy of each retrieved case. For each retrieved case, we used the algorithms of the MAC/FAC to compute two kinds of similarity scores: C-Vectors and SESs. As a result, the computed content vectors explained the overall retrieval of cases well, whereas the structural evaluation scores had a strong relation to the rated scores (Figure 2). These results support the MAC/FAC’s theoretical assumption – different similarities are involved in the two stages of analogical reasoning.

Keyword: cognitive science, open-ended data, cognitive modeling, analogical reasoning.

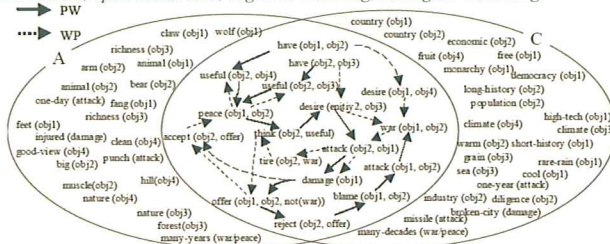


Figure 1. Propositions contained in the cue stories

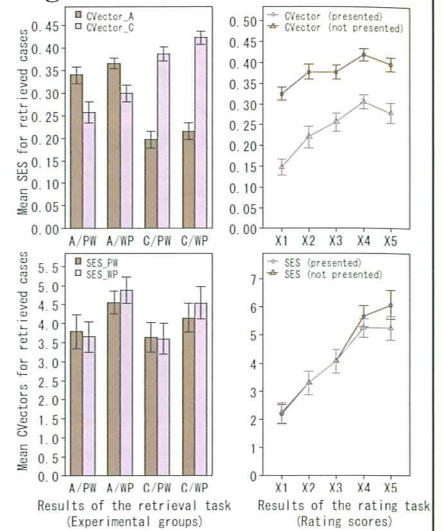


Figure 2. Results of the experiment