Forecasting the evolution of a system: the role of cognitive strategies in complexity discovery

Jean-François Gagnon
Université Laval

Sébastien Tremblay
Université Laval

Abstract: The present study investigates the use of cognitive strategies to forecast the evolution of a complex and dynamic situation. The experimental task requires subjects to predict the evolution (t+1) of the state of multiple variables within a self-determined situation embedded in a system dynamics simulation. Four distinct scenarios entail a total of 24 variables that evolve dynamically at different levels of complexity. Complexity of the evolution is measured by its distance from a linear model. Results show that performance (i.e. fit of predictions to real simulation change) decreases as complexity of the evolution increases. Data also suggest that subjects adapt their strategy as the complexity increases, and hence achieve better performance than if they had kept their initial one. This suggests that cognitive strategies used to predict system evolution should be taken into account in modeling the relation between complexity and prediction performance.