Announcing the Final Examination of Mr. Javier Rivera for the degree of Doctor of Modeling and Simulation

Date: May 5, 2016
Time: 12:00 p.m.
Room: Partnership II Room #141.
Dissertation title: Cognitive Flexibility: Using Mental Simulation to Improve Script Adaptation

Human behavior and decision-making depend largely on past experiences that generate specific action patterns (i.e., scripts, Gioia & Manz, 1985) for specific situations. In an ideal world, in which changes in the environment do not conflict with these action patterns, humans would be able to operate consistently, efficiently, and automatically. However, real-world environments are dynamic and fluid, thus altering behavior and forcing changes in scripts. Research suggests that to implement alternate solutions to changing situations, humans select from a "library" of learned scripts. Since humans tend to implement scripts to the degree that these are successful over a period of time, implementing alternate scripts can be difficult. That is, unless one has the cognitive flexibility to adapt scripts, implementing a new solution to a problem can be difficult and/or unsuccessful. Cognitive flexibility allows one to restructure knowledge to form an adaptive response to changes set forth by the environment. At issue is the difference between possessing a repertoire of scripts that can be selected and implemented to solve a problem, and having the cognitive flexibility to effectively switch between scripts when a change in context occurs. The purpose of this dissertation is to: (a) evaluate the effectiveness of possessing alternate scripts to respond to situations, and (b) assess the effectiveness of cognitive flexibility training on the ability to switch between scripts. The ultimate goal is to improve mental flexibility in situations where a specific approach should be revised and adjusted to conform to changes in context. A total of 48 participants were randomly assigned to one of four conditions in a 2 (number of scripts) x 2 (training present or absent) design: (a) single script, (b) single script and cognitive flexibility training, (c) two scripts, and (d) two scripts and cognitive flexibility training. Participants either learned one script or two scripts on how to respond to a car engine overheat. In addition, depending on the study condition, participants completed a cognitive flexibility training that used a mental simulation approach. The cognitive flexibility training was intended to allow participants to imagine a number of different scenarios that may impact that task, evaluate assumptions, check assumptions against the situation, imagine a response to such scenarios, and review the effectiveness of the developed solutions. The results of this research suggested that for situations requiring a change or an adaptation to an alternate script, possessing two scripts facilitated correct decision-making, whereas cognitive flexibility training may have hindered decision-making. In addition, for situations requiring a standard script, possessing two scripts was detrimental to decision-making performance, regardless of cognitive flexibility training. Theoretical implications in terms of script-processing and cognitive flexibility, as well as practical implications for training design are provided.

Outline of Studies:
Major: Modeling and Simulation

Educational Career:
B.S., 2007, University of Central Florida
M.S., 2010, University of Central Florida

Committee in Charge:
Dr. Florian Jentsch
Dr. Stephanie Lackey
Dr. Randall Shumaker
Dr. Valerie Sims

Approved for distribution by Florian Jentsch, Committee Chair, on April 25, 2016.

The public is welcome to attend.