Managing a Chocolate Factory and Controlling Forest Fires: How to Learn to Make Smarter Decisions

Yoannis Hermida & C. Dominik Güss, PhD • University of North Florida

INTRODUCTION

- Adult decision-makers have the mental ability to make decisions in complex and dynamic environments; however, they also often show cognitive biases and errors within this process (Dörner, 1996).
- Self-reflective, dynamic decision-making (DDM) demands the need for decision makers to consciously contemplate over possible solutions they can take in any given situation (Locke & Latham, 2006).
- DDM process involves identifying a problem, defining goals, gathering information relevant to their goals, elaboration and prediction, and finally formulating a strategy to achieve these goals (Brehmer & Dörner, 1993; Güss, 2011; Locke & Latham, 2006; Ramnarayan et al., 1997).

PURPOSE

The goal of this study is to test if a short training program on errors in DDM and self-reflection can improve performance in two different dynamic computer simulations.

The implications of this study are critical for organizations that encounter dynamic, complex, and uncertain problem situations, as these organizations could utilize DDM training practices focusing on human error and self-reflection for future personnel trainings.

Hypothesis

We predict that individuals who are exposed to error training, compared to those who do not receive the training, would use more self-reflective DDM strategies in complex situations and show better task performance.

METHOD

- 100 undergraduate students participated in the current study.
- Half of the participants worked on ChocoFine and about half on WinFire. ChocoFine lasted 1 hour, WinFire 15 minutes.

Instrumentation

- "**Errors and Their Causes**" training sheet included 6 DDM steps: Problem identification, goal definition, information gathering, elaboration and prediction, planning, decision-making, and action; and evaluation of outcome and self-reflection.
- **ChocoFine** is highly complex with over 1,000 simulated variables and highly non-transparent.
- **WinFire** is less complex, but highly dynamic and therefore, places the participant under more time pressure.
- Participants either independently managed a computer-simulated chocolate factory—ChocoFine (Dörner, 2000) or were a fire rescue chief overseeing the extinguishing of forest fires in the simulation WinFire (Schaub, 2017).

Sample Characteristics

- The current study included 53 males and 47 females, for a total of 100 participants.
- Participant ages ranged from 18 to 41 years old, $(M = 21, SD = 4.08)$.
- Participant races included White, Black, Hispanic, Asian, and other.

RESULTS

- Preliminary results showed marginally significant differences in performance between experimental and control groups, with experimental groups performing slightly better.
- Participants working on ChocoFine reported more errors regarding information gathering; and planning, decision making, and action compared to participants in WinFire.
- Participants in both the ChocoFine and the WinFire experimental groups reported less errors than the respective control groups.
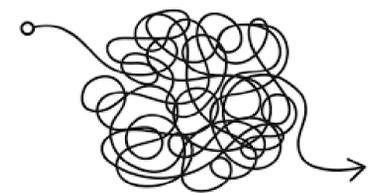
ChocoFine
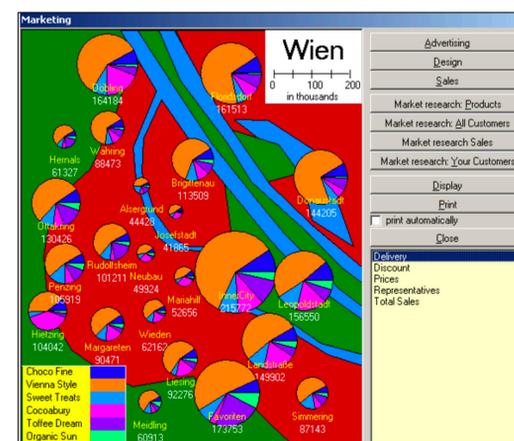
WinFire

DISCUSSION & CONCLUSIONS

- High self-reflection and training participants in DDM process can improve cognitive outcomes and performance in dynamic and complex tasks such as ChocoFine and WinFire.
- The results of this study can translate to practical applications for managerial personnel who make decisions in often stressful and dynamic work environments.
- Encourage the use of self-regulatory decision-making training for business organizations.

LIMITATIONS

- Self-reflection was a self-reported measure. One cannot assume when and how participants exactly engaged in self-reflection.
- Generalizability: The computer simulations, WinFire and ChocoFine, are created to mimic real-world scenarios and used in many training programs with companies and organizations. Would the findings generalize to complex decisions in organizations?

UNF UNIVERSITY *of* NORTH FLORIDA