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SAP & ERPsim for Research

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Panel Discussion
Online | Sep 27, 2022

ERPsimLab
HEC MONTRÉAL
Serious games to learn enterprise systems and business analytics

Agenda

1. Opening address
   - Sindhu Gangadharan – 10 am Singapore Time
   - Karina Edmonds – 1 pm Montréal Time
2. Panel discussion
3. Q&A
4. Closing remarks

Keynote speaker (1 pm Montréal Time)

Karina Montilla Edmonds, PhD

SVP, Global Head of Academies and University Alliances, SAP

Keynote speaker (10 am Singapore Time)

Sindhu Gangadharan

SVP & MD, SAP Labs India and Head, SAP User Enablement

Moderators

Michael Bliemel

Ontario Tech University

Pierre-Majorique Léger

HEC Montréal

Panelists (1 pm Montréal Time)

Karina Edmonds
SAP Academies and University Alliances

Jeff Mullins
University of Arkansas

Bih-Ru Lea
Missouri University of S&T

Mark Angolia
East Carolina University

Mark Hwang
Central Michigan University

Burak Oz
HEC Montréal

Panelists (10 am Singapore Time)

Ramesh Behl
International Management Institute

SVK Bharathi
Symbiosis Intl. (Deemed University)

Mehmood A. Chadhar
Federation University Australia

Nadia Faisal
Federation University Australia

Jeff Mullins
University of Arkansas

Bih-Ru Lea
Missouri University of S&T

Mark Hwang
Central Michigan University

Burak Oz
HEC Montréal

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ERPsim

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Experimental Research Examples

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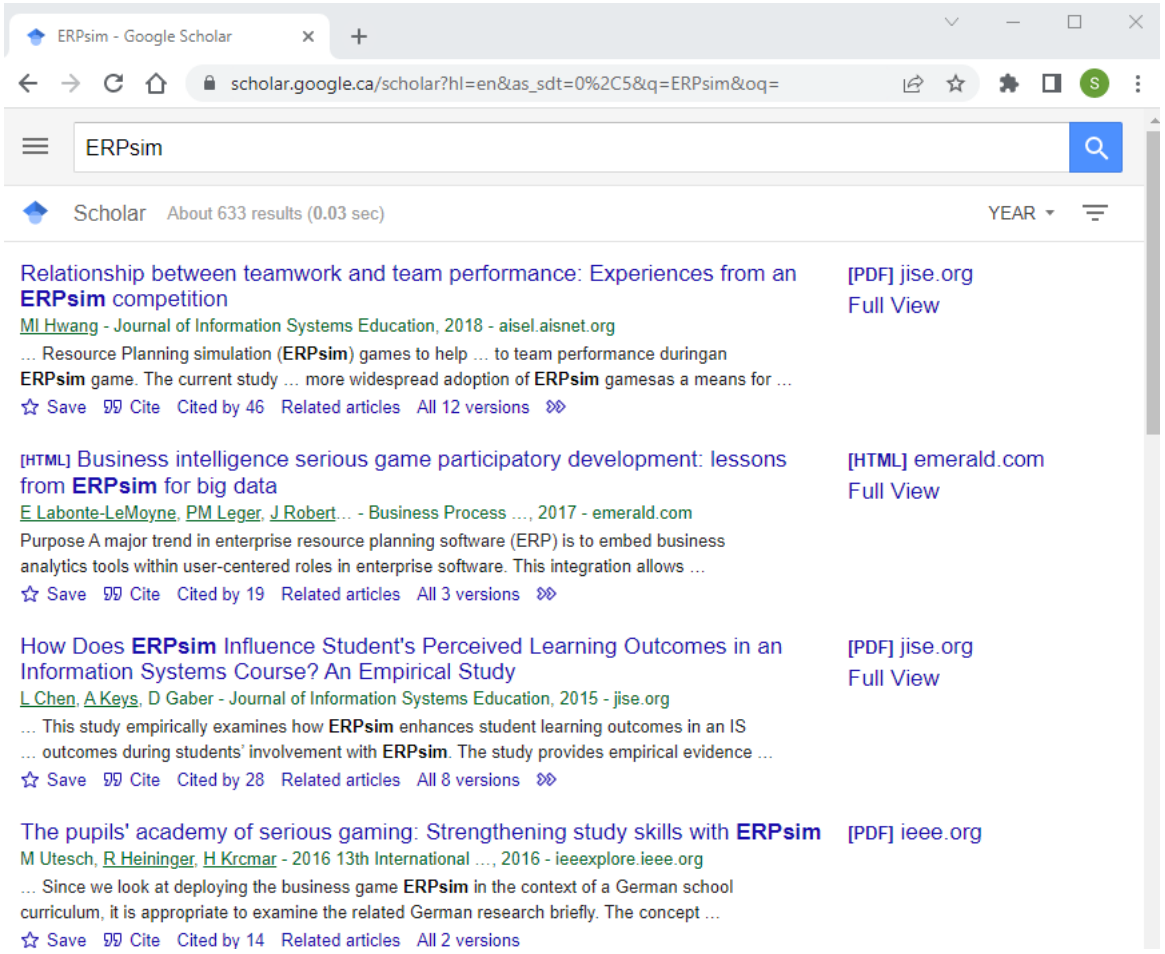
ERPsim for Research

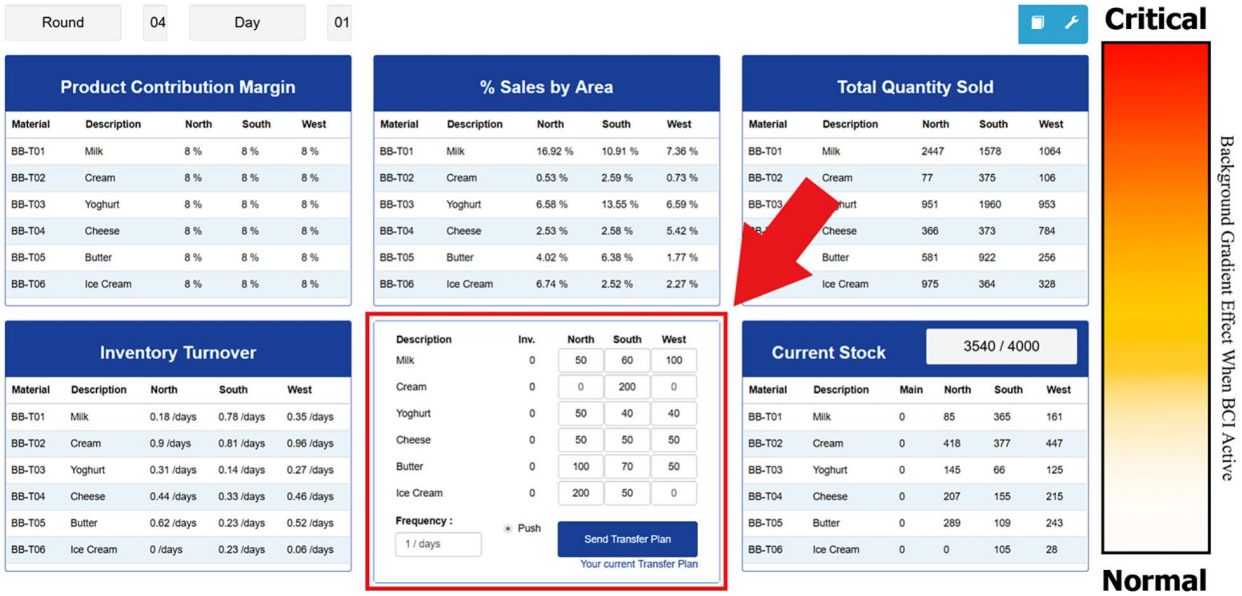


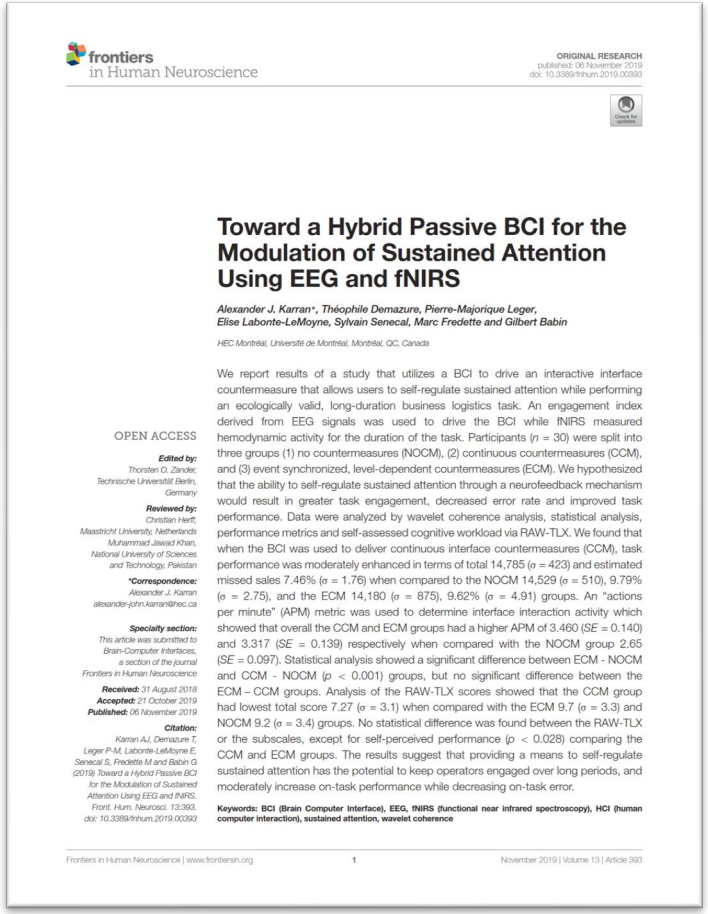
- # Towards a Hybrid Passive BCI for the Modulation of Sustained Attention Using EEG and FNIRS

Objective: Test the effectiveness of a brain-computer interface in regulating users' attention in monitoring tasks

Methods:

Participants as individuals, logistics introduction game with only stock transfer decisions, **simulation speed is very slow**




frontiers in Human Neuroscience

ORIGINAL RESEARCH

Toward a Hybrid Passive BCI for the Modulation of Sustained Attention Using EEG and fNIRS

Alexander J. Karran, Théophile Demazure, Pierre-Majorique Leger, Elise Labonte-LeMoyne, Sylvain Senecal, Marc Fredette and Gilbert Babin

HEC Montréal, Université de Montréal, Montréal, QC, Canada

We report results of a study that utilizes a BCI to drive an interactive interface countermeasure that allows users to self-regulate sustained attention while performing an ecologically valid, long-duration business logistics task. An engagement index derived from EEG signals was used to drive the BCI while fNIRS measured hemodynamic activity for the duration of the task. Participants (n = 30) were split into three groups (1) no countermeasures (NOCM), (2) continuous countermeasures (CCM), and (3) event synchronized, level-dependent countermeasures (ECM). We hypothesized that the ability to self-regulate sustained attention through a neurofeedback mechanism would result in greater task engagement, decreased error rate and improved task performance. Data were analyzed by wavelet coherence analysis, statistical analysis, performance metrics and self-assessed cognitive workload via RAW-TLX. We found that when the BCI was used to deliver continuous interface countermeasures (CCM), task performance was moderately enhanced in terms of total 14,785 (σ = 423) and estimated missed sales 7.46% (σ = 1.76) when compared to the NOCM 14,529 (σ = 510), 9.79% (σ = 2.75), and the ECM 14,180 (σ = 875), 9.62% (σ = 4.91) groups. An "actions per minute" (APM) metric was used to determine interface interaction activity which showed that overall the CCM and ECM groups had a higher APM of 3.460 (SE = 0.140) and 3.317 (SE = 0.139) respectively when compared with the NOCM group 2.65 (SE = 0.097). Statistical analysis showed a significant difference between ECM - NOCM and CCM - NOCM (p < 0.001) groups, but no significant difference between the ECM – CCM groups. Analysis of the RAW-TLX scores showed that the CCM group had lowest total score 7.27 (σ = 3.1) when compared with the ECM 9.7 (σ = 3.3) and NOCM 9.2 (σ = 3.4) groups. No statistical difference was found between the RAW-TLX or the subscales, except for self-perceived performance (p < 0.028) comparing the CCM and ECM groups. The results suggest that providing a means to self-regulate sustained attention has the potential to keep operators engaged over long periods, and moderately increase on-task performance while decreasing on-task error.

Keywords: BCI (Brain Computer Interface), EEG, fNIRS (functional near infrared spectroscopy), HCI (human computer interaction), sustained attention, wavelet coherence

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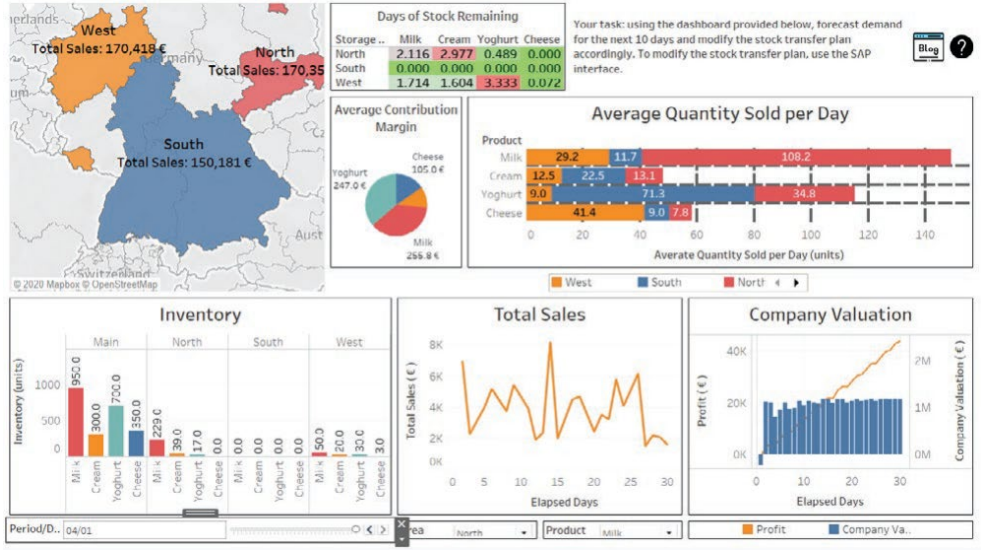
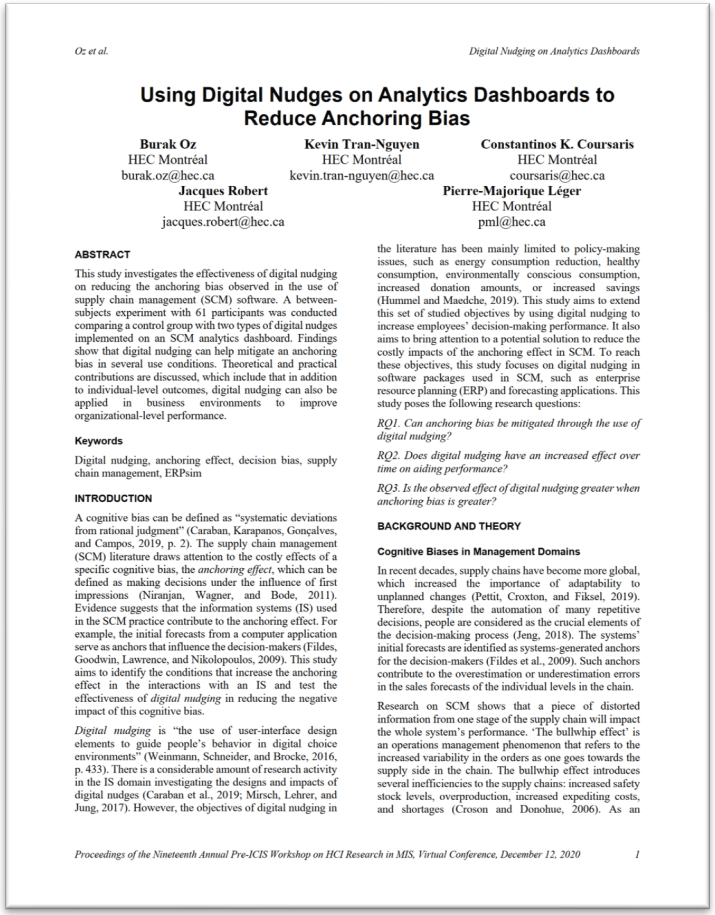
• Using Digital Nudges on Analytics Dashboards to Reduce Anchoring Bias

Objective: Test the effectiveness of digital nudging in mitigating anchoring bias

Methods:

Participants as individuals, logistics introduction game with only stock transfer decisions, **simulation speed is very fast, decisions only made in-between rounds**





Oz et al. Digital Nudging on Analytics Dashboards

Using Digital Nudges on Analytics Dashboards to Reduce Anchoring Bias

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ABSTRACT

This study investigates the effectiveness of digital nudging on reducing the anchoring bias observed in the use of supply chain management (SCM) software. A between-subjects experiment with 61 participants was conducted comparing a control group with two types of digital nudges implemented on an SCM analytics dashboard. Findings show that digital nudging can help mitigate an anchoring bias in several use conditions. Theoretical and practical contributions are discussed, which include that in addition to individual-level outcomes, digital nudging can also be applied in business environments to improve organizational-level performance.

Keywords

Digital nudging, anchoring effect, decision bias, supply chain management, ERPsim

INTRODUCTION

A cognitive bias can be defined as "systematic deviations from rational judgment" (Caraban, Karapanos, Gonçalves, and Campos, 2019, p. 2). The supply chain management (SCM) literature draws attention to the costly effects of a specific cognitive bias, the *anchoring effect*, which can be defined as making decisions under the influence of first impressions (Niranjan, Wagner, and Bode, 2011). Evidence suggests that the information systems (IS) used in the SCM practice contribute to the anchoring effect. For example, the initial forecasts from a computer application serve as anchors that influence the decision-makers (Fildes, Goodwin, Lawrence, and Nikolopoulos, 2009). This study aims to identify the conditions that increase the anchoring effect in the interactions with an IS and test the effectiveness of *digital nudging* in reducing the negative impact of this cognitive bias.

Digital nudging is "the use of user-interface design elements to guide people's behavior in digital choice environments" (Weinmann, Schneider, and Brocke, 2016, p. 433). There is a considerable amount of research activity in the IS domain investigating the designs and impacts of digital nudges (Caraban et al., 2019; Mirsch, Lehrer, and Jung, 2017). However, the objectives of digital nudging in the literature has been mainly limited to policy-making issues, such as energy consumption reduction, healthy consumption, environmentally conscious consumption, increased donation amounts, or increased savings (Hummel and Maedche, 2019). This study aims to extend this set of studied objectives by using digital nudging to increase employees' decision-making performance. It also aims to bring attention to a potential solution to reduce the costly impacts of the anchoring effect in SCM. To reach these objectives, this study focuses on digital nudging in software packages used in SCM, such as enterprise resource planning (ERP) and forecasting applications. This study poses the following research questions:

RQ1. Can anchoring bias be mitigated through the use of digital nudging?

RQ2. Does digital nudging have an increased effect over time on aiding performance?

RQ3. Is the observed effect of digital nudging greater when anchoring bias is greater?

BACKGROUND AND THEORY

Cognitive Biases in Management Domains

In recent decades, supply chains have become more global, which increased the importance of adaptability to unplanned changes (Pettit, Croxton, and Fiksel, 2019). Therefore, despite the automation of many repetitive decisions, people are considered as the crucial elements of the decision-making process (Jeng, 2018). The systems' initial forecasts are identified as systems-generated anchors for the decision-makers (Fildes et al., 2009). Such anchors contribute to the overestimation or underestimation errors in the sales forecasts of the individual levels in the chain.

Research on SCM shows that a piece of distorted information from one stage of the supply chain will impact the whole system's performance. 'The bullwhip effect' is an operations management phenomenon that refers to the increased variability in the orders as one goes towards the supply side in the chain. The bullwhip effect introduces several inefficiencies to the supply chains: increased safety stock levels, overproduction, increased expediting costs, and shortages (Croson and Donohue, 2006). As an

Oz, Burak; Tran-Nguyen, Kevin; Coursaris, Constantinos K.; Robert, Jacques; and Léger, Pierre-Majorique, "Using Digital Nudges on Analytics Dashboards to Reduce Anchoring Bias" (2020). SIGHCI 2020 Proceedings. 3.

Thank You!

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