Winter 2015 Newsletter

INFORMS Behavioral Operations Management Section

If you have any information for the next issue of this semiannual newsletter please forward an announcement to kschultz@afit.edu.

This newsletter cannot continue without your input.

Old copies of the newsletter can be found at the INFORMS Section Website https://www.informs.org/Community/BOM

General topics include:
A. People
B. Places (Meetings)
C. Things (Research)
D. On the Market

A. People:
The POMS Behavioral Operations College is seeking candidates for leadership roles. Elections to be held in October:
BeOps College VP,
BeOps College Treasurer (tentative). Please let Elliot Bendoly (bendoly.2@osu.edu) know directly if you would be interested, or would like more details.

Cornell announces the launch of the Cornell Institute for Healthy Futures “to provide a multi-disciplinary platform for integrating hospitality, health management/policy, and design thinking to enhance service excellence in healthcare, wellness, senior living and related industries.”

Rich Main has taken command of the 316 Expeditionary Sustainment Command responsible 8,000 Army Reserve Soldiers in the Northeastern United States.

Eirini Spiliotopoulou has accepted a position at VU University Amsterdam in the department of Information, Logistics and Innovation, Faculty of Economics and Business.


Surveys in Operations Research and Management Science (SORMS), formerly known as the Handbooks in Operations Research series, is planning a special issue in behavioral operations management. SORMS publishes state-of-the-art literature reviews on important topics in OR/MS. This special issue will focus on presenting recent research in sub areas of behavioral OM. The deadline for first submissions is September, 2016 with publications slated for July, 2017. See the full call for papers and submission instructions at: http://www.journals.elsevier.com/surveys-in-operations-research-and-management-science/call-for-papers/call-for-papers-consumer-behavior-in-operations-management/

On behalf of the awards committee, please join in congratulating the winners of the 2015 INFORMS Behavioral Operations Management
Section Best Working Paper Award. The results were announced at the conclusion of a special presentation session at INFORMS 2015. While we recognize the winners, the entries suggest a strong pipeline of future work to advance the field. There were 26 entries and there were many high quality submissions – we expect many of these working papers to appear in top academic journals. The entries demonstrated diversity in the breadth and depth of important operations management topics. They also showcase the diversity of research methods, which included analytical modeling, lab/field experiments and econometric / secondary data analyses. The research questions involved individuals, supply chain members, group processes and consumer interactions with both products and services; these also spanned a range of supply chain, operations, healthcare, and organizational settings.

First Place: Bargaining Process and Channel Efficiency by Ernan Haruvy (University of Texas at Dallas), Elena Katok (University of Texas at Dallas), and Valery Pavlov (University of Auckland)

Second Place: Transparency and Indirect Reciprocity in Social Responsibility: An Incentivized Experiment by Tim Kraft (University of Virginia), Leon Valdes (Massachusetts Institute of Technology), and Yanchong Zheng (Massachusetts Institute of Technology)

Honorable Mention: Learning From the Best: The Effects of Public Relative Performance Feedback on Variability and Productivity by Hummy Song (Harvard University), Anita L. Tucker (Brandeis University), Karen L. Murrell (Kaiser Permanente), and David Vinson (Kaiser Permanente)

Enno Siemsen is now the Procotor and Gamble Bascom Professor at the University of Wisconsin and the Director of the Erdman Center for Operations and Technology Management. His new email is esimse
n@wis
c.edu.

Along with his new job, Enno has a new house. Apparently with trees and everything!

New Initiative: Scotiabank Customer Analytics Center at Smith School of Business, Queen’s University Anton Ovchinnikov sent word that a new research centre that will harness the power of data analytics has been established at Smith School of Business, Queen’s University with a generous support of $2.2 million from Scotiabank. Slated to open in February 2016, the Scotiabank Centre for Customer Analytics will bring together professors and students to collaborate with Scotiabank teams on applied research in customer analytics. The Centre will be co-led by Professors Yuri Levin and Mikhail Nediak with participation from faculty in various academic disciplines. See the official announcement here: http://www2.business.queensu.ca/webmail/62012/159561419/3ce0c62c83368a9531f4331f8a49b8e93450dc19a03182fd28a90a76be5afcf3

The newly established Scotiabank Customer Analytics Center at Smith School of Business, Queen’s University has two currently-open post-doc positions: https://smith.queensu.ca/faculty_and_research/faculty-recruitment/post-doctoral-positions.php Please contact Prof. Mikhail Nediak at mikhail.nediak@queensu.ca if you require more information about these positions.
Jaime Andres Castaneda is happy to announce he has accepted a tenure track position at the School of Management of Universidad del Rosario in Bogota, Columbia. The Universidad del Rosario is the oldest University in Columbia and one of the most prestigious in the country.

Rachel Croson is moving to Michigan State University (Ed note: aka “The University in Michigan” “that other school up north” or “who?” depending on your Big 10 affiliation.) She will be the Dean of the college of Social Sciences. “Her strong leadership, record of accomplishments and enthusiasm for the future of the college will benefit our entire community of social, behavioral and economic science faculty, researchers and students.” (MSU Provost June Pierce Youatt) Congratulations Rachel!

Zhixi Wan has been prompted to an Associate Professor with tenure at the University of Oregon’s Operations and Business Analytics department. Go Blue and Go Ducks!"

John Macdonald has moved to Colorado State University. His new email is John.Macdonald@colostate.edu.

B. Places

The Seventh International Workshop on Behavioral Operations Management jointly organized by Tsinghua University and Tianjin University was held in Tianjin China on December 19-20, 2015. There were more than 460 conference participants. Lorenz Goette (University of Bonn), Brent Moritz (Penn State University), Anton Ovchinnikov (Queen's University), Enno Siemons (Univ. of Wisconsin-Madison), and Jianfeng Yu (University of Minnesota) gave keynote speeches. Tony Haitao Cui, Shucheng Fang, Minqiang Li, George Shanthikumar, Wei Zhang, and Xiaobo Zhao served as co-chairs for the workshop.

The 2016 International Workshop on Behavioral Operations Management will be jointly organized by Tsinghua University and Southeast University and take place in Southeast University in Nanjing on December 17-18, 2016. Southeast University (SEU), initially established in 1902 as Sanjiang Normal
College, is one of the oldest institutions of higher education in China. Southeast University has become a comprehensive and research-oriented university featuring the coordinated development of such multi-disciplines as science, engineering, medicine, literature, law, philosophy, education, economics, management, art, etc., with engineering as its focus.

**NFORMS International**'s first ever Behavioral Operations Management track was presented this past summer at Waikoloa Beach Resort on the Big Island of Hawaii. At seven sessions the track was the fourth largest in the conference. As a whole, the conference suffered from low attendance with 200 of the registered participants not being able to make it.

Earlier this summer (July 14-16) the Wisconsin School of Business hosted the 11th Annual Behavioral Operations Conference in Madison. UT-Dallas, Maryland, Penn. State, and Minnesota were also sponsors. The conference attracted over 80 junior and senior scholars from all over the world - including India, China, New Zealand, Europe, and Latin America. About 40 scholars also participated in the Young Scholar’s Workshop on the first day, which included engaging tutorials on the editorial/revision process (Andrew Davis, Enno Siemsen, and Karen Donohue) and on field experiments (Justin Sydnor). George Wu gave the keynote talk during the main
conference, and Elena Katok led us in an interactive demonstration with the software SoPHIE. Finally, congratulations to Bob Batt who won the "Best Presentation Award" by popular vote!

Anton Ovchinnikov chaired the Behavioral Operations track at the Canadian Operations Research Society's (CORS) conference in Banff, Alberta. Despite the small scale of the conference, the sessions were well attended and included topics in inventory management, dynamic pricing and revenue management, procurement contract design and project management. 2017 CORS will be held in Quebec City on July 17-21, 2017, jointly with IFORS; stay tuned for updates and plan on visiting this amazing city and conference next summer.

The Behavioral Operations track in this year’s POMS Annual meeting was the largest ever – consisting of 24 total sessions and almost 100 papers presented. Thanks to everyone for a great event. It was preceded by Behavioral Ops mini-conference. The next mini-conference will be at the 2018 meeting.

D. Things:


Can managers enhance social responsibility while also improving profitability? Research demonstrates that there are “win-win” investments that improve both socially desirable outcomes and the bottom line, from energy and the environment to wages and workplace safety. Yet many such opportunities are not taken—money is left on the table. Here we explore this puzzle using the case of energy efficiency in a large research university, a setting that should favor implementation of win-win actions. However, despite a long time horizon, large endowment and pro-social mission, the university failed to implement many programs offering both large environmental and financial benefits. Using ethnographic field study and panel regression we develop a novel simulation model integrating energy use, maintenance, and facilities renewal. We find that the organization inadvertently fell into a capability trap in which poor performance prevented investments in win-win opportunities and the capabilities needed to realize them, perpetuating poor performance. Escaping the trap requires investments large enough and sustained long enough to cross tipping thresholds that convert the vicious cycle into a virtuous cycle of better performance, greater investment and still better performance. We discuss how the organization is escaping from the trap and whether the results generalize to other contexts.

http://video.aom.org/services/player/bcpid4138000623001?bckey=AQ~~,AAADuYB6PgE~,FtI5Ot0kV8eotAjjTBjmGwmJPHwdlAs&bctid=4744425476001


Inventory record inaccuracy (IRI) is a pervasive problem in retailing and causes non-trivial profit loss. In response to retailers’ interest in identifying antecedents and consequences of IRI, we present a study that comprises multiple modeling initiatives. We first develop a dynamic simulation model to compare and contrast impacts of different operational errors in a continuous (Q, R) inventory system through a full-factorial experimental design. While backroom and shelf shrinkage are found to be predominant drivers of IRI, the other three errors related to recording and shelving have negligible impacts on IRI. Next, we empirically assess the relationships between labor availability and IRI using longitudinal data from five stores in a global retail chain. After deriving a robust measure of IRI through Bayesian computation and estimating panel data models, we find strong evidence that full-time labor reduces IRI whereas part-time
labor fails to alleviate it. Further, we articulate the reinforcing relationships between labor and IRI by formally assessing the gain of the feedback loop based on our empirical findings and analyzing immediate, intermediate, and long-term impacts of IRI on labor availability. The feedback modeling effort not only integrates findings from simulation and econometric analysis but also structurally explores the impacts of current practices. We conclude by discussing implications of our findings for practitioners and researchers.


Various operational strategies for mitigating supply chain disruption have been studied theoretically, but few studies have investigated behavioral decision-making in multi-echelon supply chains experiencing disruptions. We explore the effects of communicating disruption information in real-time to supply chain members using the beer distribution game in a controlled laboratory setting. Both upstream (manufacturer) and downstream (retailer) disruptions are independently considered, and in each of these scenarios, the difference between sharing and not sharing the disruption information is investigated. We find that supply chain disruptions may cause higher order variability when compared to the base case (no disruption). For a disruption at an upstream echelon, sharing the disruption information is found beneficial in reducing order variability and supply chain cost—upstream echelons experience more benefits from information sharing than downstream echelons. Therefore, we advocate that manufacturers share supply disruption information in real-time in order to benefit from a reduced bullwhip effect and its associated costs. For a disruption at a downstream echelon, sharing disruption information does not appear to have a significant benefit. Past studies have shown the importance of sharing downstream inventory information with upstream supply chain members. In the event of disruptions, our results demonstrate that sharing upstream disruption information with downstream members is beneficial.


When dealing with urgent, ill-defined problems, such as rapidly evolving emergency situations, operations managers have little time for problem formulation or solution. While the mechanisms by which humans formulate and solve problems have been described, mechanisms for rapid, concurrent formulating and solving are not well understood. This study investigates these mechanisms through a field study of transportation planning in a humanitarian response setting. The findings show that the problem is solved through greedy search and formulated through sensemaking, in which search enables updates to an evolving problem formulation, and the formulation directs and limits the search process. This study explores the implications of these findings for the development of better problem formulation processes and problem-solving strategies for urgent and ill-defined operations management problems.


We present an experimental study of the price-setting newsvendor problem, which extends the traditional framework by allowing the decision maker to determine both the selling price and the order quantity of a given item. We compare behavior under this model with two benchmark conditions where subjects have a single decision to make (price or quantity). We observe that subjects deviate from the theoretical benchmarks when they are tasked with a single decision. They also exhibit anchoring behavior, where their anchor is the expected demand when quantity is the decision variable and is the initial inventory level when price is the decision variable. When decision makers set quantity and price concurrently, we observe no significant difference between the normative (i.e., expected profit-maximizing) prices and the decision makers’ price choices. Quantity decisions move further from the normative benchmarks (compared to when subjects have a single decision to make) when the ratio of cost to price is less than
half. When this ratio is reversed, there is no significant difference between order levels in single- and multi-task settings. In the multidecision framework, we also observe a tendency to match orders and expected demand levels, which subjects can control using prices.


Operational failures persist, in part because employees work around them without engaging in actions to prevent recurrence. To break this cycle, we investigate the impact of work design factors on responses to operational failures. We use hospital nurses as subjects in a laboratory experiment, where, unknown to them, two medication administration supplies are missing. We observe their real-time responses to the two failures and whether they contribute an improvement idea. We randomly assign half of the participants to an experiment location far away from a satellite pharmacy where the missing supplies can be obtained (“difficult condition”), and the other half are located near the satellite pharmacy (“easy condition”). Both conditions contain risky, against-policy supplies that can be used to complete the work tasks, giving participants a choice between policy-compliant workarounds and risky, against-policy workarounds. In the first study, we find that participants in the difficult condition are more likely to contribute improvement ideas but are less likely to use policy-compliant workarounds. A second experiment with a 2 × 2 design shows that participants in the difficult condition who have high access to the process owner are more likely to use policy-compliant workarounds than when they have low access. Our results suggest that hospitals can increase communication about operational failures by deliberately making it difficult to work around them while simultaneously providing a high level of access to process owners. Otherwise, nurses encountering operational failures are likely to resort to against-policy workarounds, a behavior observed in practice.


To date, it has not been elucidated whether the strategy method and the direct-response method lead to different behaviors in experiments of economic games. In this study, we investigate this issue under a multi-round setting of the capacity allocation game with both of the elicitation methods. In the first experiment (regular behavioral experiment), subjects are paired to make decisions in a laboratory through a computer network platform. In the second experiment (neuroimaging experiment), the functional magnetic resonance imaging (fMRI) technique is applied to observe similarities and differences in brain activities between the two elicitation methods. The results show that no significant difference is observed in the ordering behaviors between the two methods. Meanwhile, the neuroimaging data reveal that the strategy method induces comparable activations in similar brain regions, as does the direct-response method. Additionally, it is more likely that subjects adjust their decisions during the feedback phase, rather than during the decision phase. Our results indicate that, in multi-round game experiments without features such as emotion, the effect of the elicitation method is not likely to be exhibited.


The planning of surgery durations is crucial for efficient usage of operating theaters. Both planning too long and too short durations for surgeries lead to undesirable consequences, e.g. idle time, overtime, or rescheduling of surgeries. We define these consequences as operating room inefficiency. The overall objective of planning surgery durations is to minimize expected operating room inefficiency, since surgery durations are stochastic. While most health care studies assume economically rational behavior of decision makers, experimental studies have shown that decision makers often do not act according to economic incentives. Based on insights from health care operations management, medical decision
making, behavioral operations management, as well as empirical observations, we derive hypotheses that surgeons’ behavior deviates from economically rational behavior. To investigate this, we undertake an experimental study where experienced surgeons are asked to plan surgeries with uncertain durations. We discover systematic deviations from optimal decision making and offer behavioral explanations for the observed biases. Our research provides new insights to tackle a major problem in hospitals, i.e. low operating room utilization going along with staff overtime.


Companies often struggle to embed environmental sustainability in their supply chain management (SCM) processes due to an insufficient understanding of how to initiate and bring environmental initiatives to fruition. Scholars argue that commitment of employees is crucial to enhance the implementation of these initiatives. Drawing from intra-organizational influence theory, this study examines how managers who champion these initiatives can gain employee affective commitment within a social network context. Prior research has investigated influence behavior by an individual (an agent) within the organization to gain the commitment of another individual (a target), by focusing on this agent–target dyad. Our research extends this single dyadic agent–target perspective, by investigating influence attempts within a more realistic, multi-dyadic context in which influence attempts by multiple agents are possible and in fact likely, and in which an actor can be both an agent and a target. We identify a 90-actor social network, resulting in 273 influence attempts surrounding the implementation of an environmental SCM initiative at a large, multinational corporation, and investigate how the affective commitment of actors in this network is achieved. Based on the analysis of a generalized linear mixed model, the results suggest that if agents want to create a high level of target commitment, then consultation and to a lesser degree inspirational appeals seem to be key, while tactics such as rational persuasion, ingratiation, legitimating, and coalition are not related to affective commitment, within the context of a social network where multiple agents often attempt to influence a target.


Strategy scholars increasingly conduct research in non-traditional contexts. Such efforts often require the assistance of third-party intermediaries who understand local culture, norms, and language. This reliance on intermediation in primary or secondary data collection can elicit agency breakdowns that call into question the reliability, analyzability, and interpretability of responses. Herein, we investigate the causes and consequences of intermediary bias in the form of faked data and we offer Response Pattern Analysis as a statistical solution for identifying and removing such problematic data. By explicating the effect, illustrating how we detected it, and performing a controlled field experiment in a developing country to test the effectiveness of our methodological solution, we encourage researchers to continue to seek data and build theory from unique and understudied settings.”


We provide a model of asset price forecasts and market prices that can be calibrated with experimental data and that can capture various behavioural characteristics of investors such as confidence and panic. We study the resulting dynamical system and show that asset price bubbles may result from seemingly reasonable forecasts and decisions of investors. The model attempts to provide insight into the qualitative connection between investors’ forecasting behaviour and the formation of bubbles and cycles.

The purpose of this paper is to consider queuing systems where captive repeat customers select a service facility each period. Are people in such a distributed system, with limited information diffusion, able to approach optimal system performance? How are queues formed? How do people decide which queue to join based on past experience? The authors explore these questions, investigating the effect of information availability, as well as the effect of heterogeneous facility sizes, at the macro (system) and micro (individual performance) levels.


In order to decrease patient waiting time and improve efficiency, healthcare systems in some countries have recently begun to shift away from decentralized systems of patient referral from general practitioners (GPs) to specialists toward centralized ones. From a queueing theory perspective, centralized referral systems can decrease waiting time by reducing the variation in the referral process. However, from a social psychological perspective, a close relationship between referring physician and specialist, which is characteristic of decentralized referral systems, may safeguard against high referral rates; since GPs refer patients directly to the specialists whom they know, they may be reluctant to damage that relationship with an inappropriate referral. The purpose of this paper is to examine the effect upon referral behavior of a relationship between physicians, as is found in a decentralized referral system, vs a centralized referral system, which is characterized by an anonymous GP-specialist relationship. In a controlled experiment where family practice residents made decisions concerning referral to specialists, physicians displaying high confidence referred significantly fewer patients in a close relationship condition than in a centralized referral system, suggesting that for some physicians, referral behavior can be affected by the design of the service system and will, in turn, affect system performance.


Prior experimental research shows that, in aggregate, decision makers acting as suppliers to a newsvendor do not set the wholesale price to maximize supplier profits. However, these deviations from optimal have rarely been examined at an individual level. In this study, presented with scenarios that differ in terms of how profit is shared between retailer and supplier, suppliers set wholesale price contracts which deviate from profit-maximization in ways that are either generous or spiteful. On an individual basis, these deviations were found to be consistent with how the profit-maximizing contract compares to the subject’s idea of a fair contract. Suppliers moved nearer to self-reported ideal allocations when they indicated a high degree of concern for fairness, consistent with previously proposed fairness models, and were found to be more likely to act upon generous inclinations than spiteful ones.


The decision to buy an item at a regular price or wait for a possible markdown involves a multi-dimensional trade-off between the value of the item, the delay in getting it, the likelihood of getting it, and the magnitude of the price discount. Such trade-offs are prone to behavioral anomalies by which human decision makers deviate from the discounted expected utility model. We build an axiomatic preference model that accounts for three well-known anomalies and produces a parsimonious generalization of discounted expected utility. We then plug this behavioral model into a Stackelberg-Nash game between a firm that decides the price discount and a continuum of consumers who decide to wait or buy, anticipating other consumers’ decisions and the resultant likelihood of product availability. We solve the markdown management problem and contrast the results of our model with those under discounted.
expected utility. We analytically show that accounting for the behavioral anomalies can result in larger markdowns and higher revenues. Finally, we calibrate our model via a laboratory experiment and validate its predictions out-of-sample.


We investigate retailers’ dynamic pricing decisions in a stylized two-period setting with possible supply constraints and demand from both myopic and strategic consumers. We present an analytical model and then test its predictions in a behavioral experiment in which human subjects played the role of pricing managers. We find that the fraction of strategic consumers in the market systematically moderates the optimal pricing structure. When this fraction exceeds a certain threshold, the retailer offers relatively small late season markdowns to discourage strategic consumers from waiting and to incentivize them to buy during the early season; otherwise, the retailer offers relatively large markdowns to divert all strategic consumers to the late season, where the majority of revenue is made. Our model analyses suggest that the latter policy is optimal under fairly broad conditions. Our experiment shows that after some significant learning, aggregate behavior is able to approximate the key qualitative predictions from our model analysis, with one notable deviation: in the presence of a mixture of myopic and strategic consumers, subjects act somewhat myopically – they underprice and oversell in the main selling season, which significantly limits their ability to generate revenue in the markdown season.


Using behavioral experiments, we study the impact of queue design on worker productivity in service systems that involve human servers. Specifically, we consider two queue design features: queue structure, which can either be parallel queues (multiple queues with a dedicated server per queue) or a single queue (a pooled queue served by multiple servers); and queue-length visibility, which can provide either full or blocked visibility. We find that 1) the single-queue structure slows down the servers, illustrating a drawback of pooling; and 2) poor visibility of the queue length slows down the servers; however, this effect may be mitigated, or even reversed, by pay schemes that incentivize the servers for fast performance. We provide additional managerial insights by isolating two behavioral drivers behind these results--task interdependence and saliency of feedback.


E. On the Market:


**Tamás Csermely**, University of Vienna. Advisor: Stefan Minner. "Behavioral Decisions in Inventory Systems with Dual Sourcing Option". [https://sites.google.com/site/csermelytamas/](https://sites.google.com/site/csermelytamas/)
