Summer 2012 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. General topics include:

A. People
B. Meetings
C. Research

A. People:

1. **Enno Siemsen** has been awarded tenure at the University of Minnesota.

2. **Lisa Scheele** won the best presentation award at the Summer Bops Conference presented by the POMS College of Behavioral Operations Management.

3. **Kyle Hyndman and Andrew Davis** won the 2011 POM Behavioral Operations Department Best Reviewer Award. This annual award is sponsored by the POMS College of Behavioral Operations and was given out for the first time this year. The award recognizes reviewers who have provided exceptionally high-quality, timely reviews during the past three years. Reviewers are nominated and voted on by a committee consisting of the Department Editor and all Senior Editors of the Behavioral Operations Department. This year’s award winners were Andrew David from Cornell University and Kyle Hyndman from Maastricht University.
4. Ken Schultz would like to announce a new member of his family. Yes, it a (slightly used) Baby Beemer.

B. Meetings:

1. **INFORMS Bops Section Election Results**
   Results of the election for Informs Behavioral Operations Section are in. Wedad Elmaghraby was elected Vice President and will become President at the next election. Ken Schultz has been reelected as Secretary and Andrew Davis will be the new Treasurer. Enno Siemsen will move from Vice President to President. New officers will assume their duties at the next meeting.

2. **2012 INFORMS Annual Conference**
   We would like to invite you to attend the Behavioral Operations track at the 2012 INFORMS Annual Conference and interact with the speakers this October.

   There are eleven full sessions set for the Bops Tract at INFORMS. We have a fine set of papers being presented, including many papers by established Behavioral Operations scholars. Additionally (and by design), some of the papers are by authors or co-authors who are better known for their work in other areas but who are presenting research that has specific behavioral observations or implications. We also have the opportunity to increase our visibility within INFORMS: Of the eleven sessions, four will be cross listed with other clusters, including Decision Analysis, Health Applications, MSOM and Revenue Management. Lastly, I’d also like to thank our session chairs and co-chairs for their work in organizing these interesting sessions: Reidar Hagtvedt, nita Tucker, Bradley Staats, Stephen Leider, Yael Grushka-Cockayne, Kay-Yut Chen, Yaozhong Wu, Enno Siemsen, Anton Ovchinnikov, Elena Katok, Andrew Davis and Karthik Ramachandran. See you in Phoenix!

3. **2012 POMS Annual Conference**
   The 2012 POMS Annual Conference included a half-day mini-conference hosted by the College of Behavioral Operations Management. It included talks from a number of well-known behavioral researchers such as George Wu, Meg Meloy, Ken Schultz, and Steve Leider.

4. **2013 POMS Annual Meeting**
   The 2013 POMS Annual Meeting will be in Denver, Colorado from May 3-6. There will be a Behavioral Operations Track chaired by Natalia Santamaria of Universidad de los Andes, n-santam@uniandes.edu.co and Cindy Wallin of BYU, cynthia.wallin@byu.edu.

   We invite papers with focus on the analysis of human behavior with relevance to operations management. This track is open to studies of all aspects of behavior that is not completely determined by perfect rationality. Examples include decision making under uncertainty and complexity, social preferences, team dynamics, decision making across cultures, collaboration across cultures, etc. Research submitted to this track should have a clear operations context. Examples include inventory planning and control, resource allocation, supply chain management, project management, and product development. We encourage submission of research focusing on design of management interventions (e.g., mechanisms) for suboptimal human behavior. All research methodologies are welcome.
5. **2012 Conference on Behavioral Research in Operations Management**

The BOPs Summer Conference was held at the University of Maryland's downtown Washington DC campus – it was deemed by all a great success. We had a record number of conference participants (75). Speakers came from all over the world, discussing a range of topics from coordination in humanitarian logistics to asset bubbles in financial markets. In addition, the accepted presentations were complemented by three keynote talks, exploring the forefront of Behavioral research, given by Axel Ockenfels, (University of Cologne) Kevin McCabe (George Mason University) and Tom Wallsten (University of Maryland).

This year there was a new addition to the conference – the day before the start of the conference, there was a Young Scholars’ Workshop <http://lema.smeal.psu.edu/conference/2012/ys.php>. The workshop was designed for PhD students and faculty new to Behavioral Operations, but attracted most of the total conference participants. Attendees were able to listen to tutorial by Rachel Croson, Gary Bolton and Ozalp Ozer. The day concluded with a research incubator: focused discussion groups, which provided an opportunity for young scholars to present their original research to more experienced scholars in a small group setting.

6. **2013 Conference on Behavioral Research in Operations Management**

The 2013 BOps Summer Conference will be hosted by Stephen Leider at the University of Michigan in Ann Arbor, June 27 - 29. The goal of this conference is to bring together researchers with a common interest in the operations interface between human behavior studies and analytical modeling, with the aim of sharing current work, identifying new research problems, and developing relationships between scholars in the field.
The conference will follow the same format as last year: a one day Young Scholars Workshop and a two day main conference. The workshop will consist of tutorials on Behavioral Research in the morning, following by a research incubator in the afternoon where young scholars can present and receive feedback. We especially encourage all conference participants to attend the workshop and share their insights.

7. The 2014 Conference on Behavioral Research in Operations Management is tentatively planned for Cologne, Germany.

C. Research:

We will use this forum to keep members updated on papers published in the area of Behavioral Operations Management. This is a great opportunity for you to get the word out on your research. Papers qualify if they are aimed principally for an Operations Management audience and if they explicitly include consideration of behavioral factors other than strict profit maximizing, or if they empirically test that assumption. Normally we include papers on individual, not organizational behavior but for the purposes of this newsletter we will accept both. Papers do NOT have to be empirical.

Please send citations and abstracts of any paper you publish in 2012 to KSchultz@afit.edu

The Journal of Operations Management will soon publish its special issue on Behavioral Operations. Enno Siemsen, Rachel Croson and Ken Schultz. The deadline for submissions was in July 2011, and 80 papers were submitted for consideration. Papers that are already accepted include


   Risks arising from operations are increasingly being highlighted by managers, customers, and the popular press, particularly related to large-scale (and usually low-frequency) losses. If poorly managed, the resulting disruptions in customer service and environmental problems incur enormous recovery costs, prompt large legal liabilities, and damage customer goodwill and brand equity. Yet, despite conventional wisdom that firms should improve their own operations by observing problems that occur in others’ processes, significant operational risks appear to be ignored and similar losses recur. Using a randomized vignette-based field experiment, we tested the influence of organization-level factors on knowledge acquisition. Two organization-level factors, namely perceived operational similarity, and to a lesser extent, market leadership, significantly influenced the risk manager’s likelihood of acquiring knowledge about possible causes that triggered another firm’s operational loss. These findings suggest that senior managers need to develop organizational systems and training to expand the screening by risk managers to enhance knowledge acquisition. Moreover, industry and trade organizations may have a role in fostering the transfer of knowledge and potential learning from operational losses of firms.
2. Elliot Bendoly. **Real-time Feedback and Booking Behavior in the Hospitality Industry: Moderating the Balance between Imperfect Judgment and Imperfect Prescription.**

Revenue management (RM) systems now have an established role in the hospitality industry. Nevertheless, use of the systems varies. The price points that these systems generate through the analysis of demand forecasts are, by their very nature, imperfect prescriptions. Given the risk of forecast error in certain reservation contexts, hotel agents are often given the latitude to accept rate bids below the pricing prescriptions of these systems. The frequency and extent of such deviation is dependent in large part on the judgment of reservation agents, who in turn are influenced by their perceptions of how their actions will be viewed by higher levels of management. In this study, we use a laboratory experiment to investigate how different forms of continuous performance feedback influence agent decisions. More specifically, we consider both a revenue-focused metric as well as a metric framed around pricing-curve adherence as the basis of two feedback mechanisms of interest. In an attempt to provide additional insight, we also monitored physiological markers of stress and arousal to determine the emotional state of subjects. The purpose is to use such observations in support of theory regarding the impact of performance measure orientation on decision making. The results suggest implications for the practical use of continuous feedback in these settings.

Announcements for other accepted publications for the first half of 2012, in the order I received them, are:


We compare how experienced procurement managers and students solve the newsvendor problem. We find that managers broadly exhibit the same kind of pull-to-center bias as do students. Also, managers use information and task-training no better than students. The performance of managers is positively affected by the level of their education and their level in the organizational hierarchy. We discuss implications for theory and for how ordering might be improved in practice.


One key driver of improvement in surgical outcomes is a surgeon’s prior experience. However, research notes that not all experience provides equal value for performance. How then should surgeons accumulate experience to improve quality outcomes? In this paper we investigate the differential effects of focal and related (i.e., tasks similar to, but not identical to, the focal task) experience. We open up the black box of the volume-outcome relationship by going beyond just dividing experience into focal and related categories, but also considering how sub-tasks, and context (i.e., the organization in which the work takes place) affect performance. To understand
these issues, we assemble a novel data set on 71 cardiothoracic surgeons who performed over 6,500 procedures during a period of 10 years since the introduction of a breakthrough surgical procedure. We find that as compared to related experience, surgeon focal experience has a greater effect on surgeon performance. We also demonstrate that sub-task experience has different, non-linear performance relationships for focal and related experience. Finally, we find that focal experience is more firm-specific than related experience and that non-firm experience reduces the learning rate for both focal and related experience. We discuss implications of our findings for healthcare delivery and operations management.


Existing research on newsvendor behavior asserts that individuals engage in demand chasing – adjusting their order quantities towards prior demand. Several metrics have been used to identify this heuristic. Via simulation, current metrics are shown to yield excessive false positives, indicating demand chasing when the true order generating process is independent of prior demand. A simple correlation measure does not suffer from this problem, and is proposed as an alternative to some of the more commonly used measures.


We study a procurement setting in which the buyer seeks a low price but will not allocate the contract to a supplier who has not passed qualification screening. Qualification screening is costly for the buyer, involving product tests, site visits, and interviews. In addition to a qualified incumbent supplier, the buyer has an entrant of unknown qualification. The buyer wishes to run a price-only, open-descending reverse auction between the incumbent and the entrant, and faces a strategic choice about whether to perform qualification screening on the entrant before or after the auction. We analytically study the buyer’s optimal strategy, accounting for the fact that under post-auction qualification the incumbent knows he could lose the auction but still win the contract. In our analysis we derive the incumbent’s optimal bidding strategy under post-auction qualification and find that he follows a threshold structure in which high-cost incumbents hold back on bidding — or even boycott the auction — in order to preserve their profit margin, and only lower-cost incumbents bid to win. These results are strikingly different from the usual open-descending auction analysis where all bidders are fully qualified and bidding to win is always a dominant strategy. We test our analytical results in the laboratory, with human subjects. We find that qualitatively our theoretical predictions hold up quite well, although incumbent suppliers bid somewhat more aggressively than the theory predicts, making buyers more inclined to use post-auction qualification.

The bullwhip effect describes the tendency for the variance of orders in supply chains to increase as one moves upstream from consumer demand. Previous research attributes this phenomenon to both operational and behavioral causes. We report on a set of laboratory experiments with a serial supply chain, using the Beer Distribution Game. The experimental conditions eliminate all operational causes of the bullwhip effect. Nevertheless, we find that the bullwhip effect persists in this setting and offer one possible explanation based on coordination risk. Coordination risk exists when individuals’ decisions contribute to a collective outcome and the decision rules followed by each individual are not known with certainty, e.g., where managers cannot be sure how their supply chain partners will behave. We conjecture that the existence of coordination risk may contribute to bullwhip behavior. We test this conjecture by controlling for environmental factors that lead to coordination risk and find these controls lead to significant reduction in order oscillations and amplification. Next, we investigate a managerial intervention to reduce the bullwhip effect, inspired by our conjecture that coordination risk contributes to bullwhip behavior. While the intervention, holding additional on-hand inventory, does not change the existence of coordination risk, we find that it reduces order oscillation and amplification by providing a buffer against the endogenous risk of coordination failure. We conclude that the magnitude of the bullwhip can be mitigated, but that its behavioral causes appear robust.


This paper studies the performance of wholesale pricing when the supply chain partners fairness concerns are private information. We find that some properties of wholesale pricing established under complete information hold under incomplete information as well. First, wholesale pricing can coordinate the supply chain, despite the information asymmetry, when fairness concerns are strong enough. Second, in the case when an equitable profit split does not imply that the retailers profit must be higher than that of the supplier, the suppliers equilibrium offer is never rejected. Overall, the study makes two primary contributions. First, it provides a partial characterization of the equilibrium when the conditions required for coordination do not hold, that is when fairness concerns are mild. In this case, the model predicts that the expected market price must be exactly the same as under complete information. The channel efficiency, nevertheless, is strictly lower than under complete information. The distribution-free lower bound on channel efficiency suggests that this efficiency loss should be quite small, though. Second, it provides an experimental test of the models predictions, as well as a direct validation of the assumptions of preferences heterogeneity and mildness by obtaining the empirical distribution of the preferences.


We report on results of several laboratory experiments that investigate on-line procurement auctions in which suppliers bid on price, but exogenous bidder quality affects winner determination. In procurement auctions, bidder quality may or may not be publically known to all bidders, and the effect of this quality transparency on the auction outcome is one aspect of auction design that we examine. The second aspect of auction design that we examine is the effect of price visibility on the auction outcome, and the interaction between price visibility and quality transparency. In terms of price
visibility, we consider two extreme cases: the sealed bid request for proposals (RFP), and the open-bid dynamic auction event. In terms of bidder quality transparency, we also consider two extreme cases: a setting in which bidder qualities are publically known and the case in which they are private. We find that in our laboratory experiments, the RFP format is consistent in generating higher buyer surplus levels than does the open-bid dynamic format. This advantage is independent of the quality transparency. In contrast, the open-bid format is highly sensitive to quality transparency, generating significantly lower buyer surplus levels when the information about bidder quality is public.


Using the controlled setting of the laboratory, we systematically investigate supply chain features that lead to production smoothing. In contrast to prior laboratory studies of the bullwhip effect, we find that the bullwhip effect disappears in several of our experiments. More importantly, our study shows that when customer demand has a predictable seasonal component, retailers smooth orders. This behavior is more pronounced when changing order levels is costly. The results demonstrate how simplifying the structure of the supply chain leads to production smoothing behavior.


A popular procurement auction format is one in which bidders compete during a live auction event but observe only the rank of their own bid and not the price bids of their competitors. We investigate the performance of auctions with rank feedback in a simple setting for which analytical benchmarks are readily available. We test these benchmarks in the laboratory by comparing the performance of auctions with rank-based feedback to auctions with full-price feedback as well as to auctions with no price feedback (sealed-bid auctions). When bidders are risk-neutral expected-profit maximizers, the buyer’s expected costs should be the same under rank and full-price feedback; moreover, expected buyer costs should be the same as in a sealed-bid auction. However, when we test this theoretical equality in a controlled laboratory setting we find that, consistent with practitioners’ beliefs but contrary to our model, rank feedback results in lower average prices than full-price feedback. We identify two behavioral reasons for the difference. The first explanation is based on the similarity of the bidders’ problem in a sealed-bid first-price auction and an open-bid auction with rank feedback. The second explanation incorporates the use of jump bids motivated by bidder impatience.

The use of screening contracts is a common approach to solve supply chain coordination problems under asymmetric information. One main assumption in this context is that managers without specific incentives will rather use their private information strategically than reveal it truthfully. This harms supply chain performance. This paper investigates the impact of information sharing in a principal-agent setting that is typical for many supply chain transactions. We conduct a laboratory experiment to test whether information sharing has an influence on supply chain coordination. We find that information sharing within the supply chain has two positive effects. First, information sharing reduces the inefficiencies resulting from information deficits, if there is a certain amount of trust in the supply chain. Second, communication can limit out-of-equilibrium behavior with a small impact on the own payoff, but a large impact on the supply chain partner. Furthermore, we find that both effects are amplified when communication takes place in an environment that allows the less informed supply chain party to punish or to reward the better informed party. Although our extended mechanisms substantially enhance the poor performance of the theoretically optimal coordination contract menu, we find no mechanism that implements supply chain performance superior to the theoretically predicted second-best level.


Although product modularity is often advocated as a design strategy in the Operations management literature, little is known about how consumers respond to modular products. In this research we undertake several experiments to explore consumer response to modularly upgradeable products in settings featuring technological change. We consider both the initial product choice (between a modularly upgradeable product and an integral one) and the subsequent upgrade decision (replacement of a module versus full product replacement). First, we show that consumers tend to discount the cost savings associated with modular upgrades excessively (insufficiently) when the time between the initial purchase and the upgrade is short (long). This suggests that modular upgradability as a product feature has higher profit potential for slowly rather than rapidly improving products. Second, we observe a preference reversal between the initial purchase and the point of upgrade: At the point of initial purchase, people foresee making a full product replacement in the future, yet, when faced with the actual upgrade decision, they are more likely to revert to modular upgrades. Finally, we discuss and test several pricing and product design strategies that the firm can use to respond to these cognitive biases.


Measures to extend the economic lives of products—such as remanufacturing carried out by closed-loop supply chains—are receiving increased attention because of various economic and regulatory factors. In this paper, we examine drivers of price differentials between new and remanufactured products using data on purchases made on eBay. Our analysis shows that seller reputation significantly explains the price differentials between new and remanufactured products. We also find that products remanufactured by original equipment manufacturers or their authorized factories are purchased at relatively higher prices than products remanufactured by third parties. However, in the presence of these reputation signals (seller reputation and remanufacturer identity), we find that stronger warranties are not significantly associated with higher prices paid for remanufactured products. Our work contributes to the closed-loop supply chain research stream in operations management by empirically examining market factors that have not been studied before.