Winter 2014 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 Section Website https://www.informs.org/Community/BOM

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

A. People:

Congratulations to Dr. Jamie Andres for his wedding to Tatiana. The ceremony was in Jamie’s home town of Medellin, Columbia on May 30th.
The Production and Operations Management Society has awarded the 2013 Skinner Teaching Innovation Award to Dr. Oliva Rogelio of the University of Cologne has an open position: Assistant Professor in Supply Chain Management For further Information, please contact: Ulrich.Thonemann@uni-koeln.de.

Mays Business School at Texas A&M. From the citation: “Professor Oliva is truly a master of the case method of teaching. His former students describe his classes as extremely demanding, even stressful, but their appreciation is clear from his consistently school-leading teaching evaluations as well as the remarkable 12 teaching awards that he has received in his 16 years of teaching. Former students consistently comment that Prof. Oliva's classes were transformational for them in the professional journeys. In addition, he has made substantial contributions to our profession through his numerous case method workshops around the world, as well as his widely-adopted Harvard Business School cases and teaching notes.”

Anton ovichinnikov is moving to the Queen’s School of Business, Kingston, Ontario as an Associate Professor of Management Science and Operations with tenure.
Dr. Elliot Bendoly has accepted a position as a Full Professor at the Ohio State University’s Fisher College of Business.

B. Places

The Behavioral Operations Cluster at the 2014 INFORMS Annual Conference (Nov 9 - 12) will consist of 13 sponsored sessions, as well as two sessions jointly sponsored with MSOM Supply Chain and Revenue Management & Pricing. Sessions will cover behavioral research using laboratory experiments, field experiments and theory. Topics include inventory management, queueing, pricing, quality, service operations, process improvement and more. Additionally, the finalists for the BOM Best Working Paper prize will present their work Sunday Nov 9 from 4:30-6:00pm. The complete schedule for the cluster is available at: https://informs.emeetingsonline.com/emeetings/formbuilder/clustersessionlist.asp?clnno=3102&mmnno=260

The Behavioral Operations Management section of INFORMS has upgraded the BOM Listserv to INFORMS Connect As the president of the Behavioral Operations Management Section All existing BOM members, will be automatically added to the BOM Community page within INFORMS Connect. If you are not currently a paid member of BOM, you will lose access to this content, as it is considered a member benefit. Don’t miss out - join now!

The 2014 BOM Summer Conference was held at the University of Cologne (sponsored by the DFG Research Unit "Design and Behavior - Economic Engineering of Firms and Markets") in Cologne, Germany. With more than 80 participants from all over the world, the conference was a great success in bringing together researchers from Behavioral Operations and related fields to boost collaboration and joint research and identifying new research directions. In addition to the three keynote talks by Jacob Goeree (University of Zurich), Michael Kramarsch (hkp/// group) and Wilhelm Hofmann (University of Cologne), the main conference consisted of 23 accepted presentations. In the Young Scholar workshop additional 17 young scholars had the opportunity to present their recent work in small groups. Those were accompanied by tutorial by Enno Siemsen (University of Minnesota) and Matthias Sutter (University of Cologne). Yesim Orhun (University of Michigan) and Brent Moritz (Penn State University) were awarded with the Best Presentation Award from the POMS College of Behavioral Operations Management. Congratulations!
The POMS College of Human Behavior hosted a mini-conference on The Human Element of Revenue Management and Pricing on May 8, 2014, in Atlanta, GA. The day included speakers from both academics and industry, including Tammy Farley (Rainmaker Group), Dev Koushik (Global Revenue Optimization, IHG), Loren Williams (EY), John Higbie (Revenue Analytics), Dr. Robert Philips (Columbia Business School), Dr. Laurie Garrow (Georgia Institute of Technology), Joshua Dick (Cox Communications), and Dr. Wedad Elmaghraby (University of Maryland). In addition to individual presentations, Dr. Elliot Bendoly (Emory University) moderated a panel discussion among many of the speakers.

The 2015 BOM Summer Conference will be held at the Johnson School at Cornell University, in Ithaca, NY June 24-26. The organizing committee is comprised of Andrew Davis, Wedad Elmaghraby, Steve Leider, and Elena Katok and Ken Schultz. As with past year conferences, it will likely include a Young Scholars Workshop, along with a series of research paper presentations. Further details will be provided at the annual Informs conference and in email announcements.

C. Things:

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 then strict profit maximizing, of 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 accepted for publication to KSchultz@afit.edu


Abstract: In this paper, we address the question of how the assessment of costs influences decisions in a newsvendor setting. We expect that different cost types lead to different behavior. In our investigation, we consider a newsvendor problem with opportunity costs and a newsvendor problem with penalty costs. In addition, we differentiate between three cases with different margins for each of the two problems. In an experimental study, we observe that the average order quantities in the newsvendor problem with penalty costs exceed the average order quantities in the newsvendor problem with opportunity costs and that a mean anchor effect, familiar from a number of previous studies, exists. A different weighting of costs can be seen as the main driver for the different order quantities. Thus, a biased perception of different cost types exists and decision makers are more
sensitive to penalty costs than to opportunity costs. Based on our observations, we can identify situations where
the cost weighting and the mean anchor effect compensate for each other and thus lead to “good” decisions as
well as situations where the two effects compound and therefore lead to “bad” decisions. As penalty costs are
present in many newsvendor situations, our insights allow us to apply the findings from behavioral studies of the
newsvendor problem to a broader context.


Abstract: This article provides a data-driven assessment of economic and environmental aspects of remanufacturing for product + service firms. A critical component of such an assessment is the issue of demand cannibalization. We therefore present an analytical model and a behavioral study which together incorporate demand cannibalization from multiple customer segments across the firm's product line. We then perform a series of numerical simulations with realistic problem parameters obtained from both the literature and discussions with industry executives. Our findings show that remanufacturing frequently aligns firms' economic and environmental goals by increasing profits and decreasing the total environmental impact. We show that in some cases, an introduction of a remanufactured product leads to no changes in the new products' prices (positioning within the product line), implying a positive demand cannibalization and a decrease in the environmental impact; this provides support for a heuristic approach commonly used in practice. Yet in other cases, the firm can increase profits by decreasing the new product's prices and increasing sales—a negative effective cannibalization. With negative cannibalization the firm's total environmental impact often increases due to the growth in new production. However, we illustrate that this growth is nearly always sustainable, as the relative environmental impacts per unit and per dollar rarely increase.


Abstract This paper discusses the interaction between revenue management and customer relationship management for a firm that operates in a customer retention situation but faces limited capacity. We present a dynamic programming model for how the firm balances investments in customer acquisition and retention, as well as retention across multiple customer types. We characterize the optimal policy and discuss how the policy changes depending on capacity limitations. We then contrast the modeling results with those of a behavioral experiment in which subjects acted as managers making acquisition and retention decisions. In the modeling part of the paper, we introduce a concept of the value of an incremental customer (VIC), and show that when capacity is unlimited, VIC equals customer lifetime value (CLV), but when capacity is limited VIC is much smaller and changes dynamically depending on the number of customers and their mix. As a result, the optimal spending is constant and depends on CLV for the firms with unlimited capacity, but changes dynamically and is generally unrelated to CLV when capacity is limited. In the experimental part, we introduce a concept of conditional optimality for the analysis of state-dependent decisions. Applying this concept to our data, we document a number of decision biases, specifically the subjects' tendency to overspend on retaining high-value customers and underspend on lower-value customers retention and acquisition. We show that providing CLV information exacerbates these biases and leads to a loss of net revenue when capacity is limited, but providing information about the marginal costs of acquisition and retention eliminated these biases and increases net revenue.


Abstract: In reverse auctions, buyers often retain the right to bargain further concessions from the winners. The optimal form of such procurement is an English auction followed by an auctioneer's option to engage in ultimatum bargaining with the winners. We study behavior and performance in this procurement format using a laboratory experiment. Sellers closely follow the equilibrium strategy of exiting the auction at their costs and then accepting strictly profitable offers. Buyers generally exercise their option to bargain according to their equilibrium strategy, but their take-it-or-leave-it offers vary positively with auction prices when they should be invariant. We explain this deviation by modeling buyers' subjective posteriors regarding the winners' costs as distortions of the Bayesian posteriors, calculated using a formulation similar to a commonly used probability weighting function. We further test the robustness of the experimental results and the subjective posterior explanation with three additional experimental treatments.


Abstract. We experimentally investigate the evolution play in an infinitely repeated voluntary contribution mechanism (VCM). We find that in infinitely repeated VCM games: (i) average contributions in the first round are similar to those of finitely repeated VCM games; (ii) most groups have a non-monotonic trend of contribution with repetition; and (iii) contributions remain at the same level after an unexpected restart. The data provides strong support for heterogeneous subjects, which may explain the non-monotonic trend of average contributions. This trend is caused by one category of subjects who expect others to contribute in period t as they did in period t − 1.


D. On the Market

In a new feature for the summer newsletter we will publish information on recent graduates who are on the job market.


Lijia Tan. Wang Yanan Institute for Studies in Economics, Xiamen University, China. "An Experimental Comparison of Reserve Price Auctions and Auctions with Renegotiation" ljtan.wise@gmail.com

George Ball. Advisor: Rachna Shah with the Supply Chain and Operations Department, Carlson School of Management, University of Minnesota. The Product Recall Decision: “A Behavioral Investigation” http://www.carlsonschool.umn.edu/faculty-research/ball0197/George_P_Ball.aspx


E. My Favorite Paper

For each newsletter I ask an accomplished researcher in our field to present one of their favorite works, one they think is worth taking a look at. This may be a paper, chapter or book and may be their ‘favorite’ in any way they wish to define it. It should be loosely related to behavioral operations and not written by them. The column will include a short introduction to the guest editor, a citation to the paper and abstract and a description by the guest editor of why the paper is his or her favorite. I hope you enjoy the feature. I encourage nominations for future guest editors for this column.

For this newsletter I am glad to welcome Dr. Enno Siemsen for and his contribution. Dr. Gary Bolton has graciously accepted to write for the next newsletter.

Schweitzer and Cachon (2000) – A Review and Commentary

Almost 15 years have gone by since the publication of Schweitzer and Cachon (2000). To refer to the paper as seminal is an understatement: it not only kicked off a stream of research on news vendor decision making, but also demonstrated that a behavioral analysis of operational decision contexts is a fruitful and important endeavor. It is, for sure, a paper that has helped to jump start the field of behavioral operations.

Using a laboratory experiment, Schweitzer and Cachon (2000) make three empirical observations: (1) average observed orders lie in between mean demand and optimal order quantities, the so-called ‘pull-to-center effect’; (2) there is an asymmetry in the pull to center effect, with order quantities being more strongly pulled towards the mean in low-margin conditions than in high-margin conditions, and 3) decision makers react to demand signals, despite their perfect knowledge of the underlying demand distribution. The pull-to-center effect has been replicated extensively by now, although, as Lau, Hasija and Bearden (2013) point out, the effect describes aggregates across a population, but is not very descriptive of individual behavior. Asymmetry in the
pull-to-center effect has also been observed in other studies, but the magnitude and direction of this asymmetry is highly variable, sometimes being in opposite direction compared to Schweitzer and Cachon (2000), see e.g. Ho, Lim and Cui (2010). Demand chasing is likely a forecasting phenomenon, with decision makers predicting the next step in a time series according to simple error-response learning despite theoretically knowing the underlying demand distribution (Kremer, Moritz and Siemsen 2010).

Schweitzer and Cachon (2000) proceed to provide theoretical explanations for the pull to center effect. They reject risk- and loss-aversion as possible explanations, since such preferences would imply lower-than-optimal inventory order quantities. This logic is generally accepted in the literature, although, as de Vericourt, Jain, Bearden and Filipowicz (2013) point out, empirically measured risk preferences still predict observed behavior in the newsvendor context. Schweitzer and Cachon (2000) proceed to examine specific preferences/biases such as stockout aversion and the underestimation of opportunity costs, and conclude similarly that neither of these would per se predict behavior that conforms with the pull-to-center effect.

The plausible explanations that Schweitzer and Cachon (2000) emphasize are prospect theory, regret, and anchor-and-adjustment behavior. In a second experiment, they expose decision makers to a shifted demand distribution which essentially eliminates losses; since the pull-to-center effect is again observable under this condition, they reject prospect theory as a possible explanation. This point is further emphasized in Nagarajan and Schechter (2014), who show that under commonly used/estimated parameters and functional forms, prospect theory would lead to the prediction that order quantities fall below their optimum for low-margin conditions, and above their optimum for high-margin conditions, which is clearly counter to the observed pull-to-center effect. Kremer, Minner and van Wassenhove (2010) also point out that any theory that reduces the newsvendor choice to a choice among lotteries provides at best an incomplete picture, since the pull-to-center effect becomes weaker if the inventory frame is taken out of the decision. This begs the question why prospect theory is such a prevalent explanation in other ‘choice under uncertainty’ contexts, and appears less useful to explain newsvendor decisions. Is this a deficiency in prospect theory, which is more established in environments with fewer outcomes, as Nagarajan and Schechter (2014) point out? Or is this due to the fact that in the newsvendor context, pinning down what subjects see as losses and gains, and therefore what the correct reference point is, is inherently more difficult than in more simple contexts of choices among gambles? Prospect theory has certainly remained discredited as an explanation of behavior since Schweitzer and Cachon (2000), but my guess is that the last argument in this discussion has not been made.

Regret theory, i.e. the preference to avoid ex-post inventory error, is seen as a robust explanation for the pull to center effect. Schweitzer and Cachon (2000) assume that this regret is symmetric for orders that exceed or are insufficient to meet actual demand. Ho, Lim and Cui (2010) propose that these costs are asymmetric, and use this asymmetry as an explanation for the asymmetry in the pull-to-center effect. Ockenfels and Selten (2014) essentially convert this argument into an impulse balance equilibrium, and propose that order quantities therefore balance ex-ante the expected impulse from over-ordering with the expected impulse from under-ordering.

In summary, much has happened in the field since Schweitzer and Cachon (2000), but also many of the observations and explanations given by Schweitzer and Cachon (2000) have stood the test of time. The paper is thus not only seminal, but also enduring, and deserves to be read. It should be a starting point for every doctoral student journeying into the field of behavioral operations.

References


