

The Effect of Power on Biased Newsvendor Order Behavior: An Experimental Study

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Abstract

We extend behavioral research in newsvendor settings by experimentally exploring the effect of power on newsvendor order decisions under two profit conditions. We also analyze people's risk profiles and explore if the expo-power utility function, which relaxes the assumption of constant absolute risk aversion, explains observed behavior.

Keywords: Power, Newsvendor, Expo-power utility function

Introduction

The Newsvendor problem characterizes situations where a procurement order, production order, or an inventory plan must be made by a manager before a realization of unknown demand occurs (Käki et al., 2013). Both leftovers and shortages are costly: if the manager orders too much, she will have to salvage leftovers or dispose them at a loss, whereas if she orders too little, she will forgo additional profits (Eeckhoudt et al., 1995). This classic single-period inventory problem dates back to Edgeworth's (1888) bank reserve problem and Arrow et al.'s (1951) inventory control policies under demand uncertainty and has been extended to more complex inventory systems (Choi, 2012) and other operations contexts such as advance booking of orders in service industries (Weatherford and Pfeifer, 1994), operating room management (Olivares et al., 2008), and resource allocation and scope decisions in new product development (Gonçalves et al., 2013), among others.

A behavioral approach studying how people place Newsvendor orders is more recent, dating back to Schweitzer and Cachon's (2000) seminal Newsvendor laboratory (lab) experiment. Despite the simple structure of the Newsvendor problem, experimental studies have frequently shown that people systematically deviate from the expected profit-maximizing quantity (e.g., Bolton and Katok, 2008; Bostian et al., 2008; Schweitzer and Cachon, 2000). In particular, these studies have shown that

people's inventory orders are lower than the optimum in high-profit or low-cost Newsvendor systems and higher than the optimum in low-profit or high-cost inventory systems. This biased order behavior is known as the pull-to-center effect (Bostian et al., 2008). Despite the pervasiveness of the bias, there is no clarity on what actually drives pull-to-center effect behavior as suggested by the different modeling approaches proposed to explain it such as ex post inventory error minimization (Schweitzer and Cachon, 2000), overconfidence (Croson et al., 2011, cited in Ren and Croson, 2013), random errors (Su, 2008), and reference dependence (Ho et al., 2010), among others.

According to choice theory, decisions and biases are also result of how people assign value to decision outcomes (Bernoulli, 1738/1954). Building on this idea, there is research studying how power changes the anticipated value of gains and losses, claiming that power holders might become less loss averse, even when power can do nothing to affect the experience of future gains and losses (see Inesi (2010) and references therein). Assuming a link between loss aversion and the pull-to-center effect (Schweitzer and Cachon, 2000), we first manipulate power through episodic priming (Galinsky et al., 2003) to reduce loss aversion and influence typical Newsvendor order behavior. We then use the expo-power utility function (Saha, 1993) to explain observed behavior since this utility function is able to capture decreasing, neutral, and increasing risk attitudes, increasing thus its potential to explain biased Newsvendor order behavior (Eeckhoudt et al., 1995).

The rest of the paper proceeds as follows: in next section we review relevant Newsvendor and power literature and formulate the main hypothesis. Then, we explain the experimental design and treatments. We describe the main findings. Finally, we conclude.

Literature review

The Newsvendor problem is a one-shot business decision that occurs in many different business contexts such as buying seasonal goods for a retailer, making the last buy or last production run decision, setting safety stock levels, selecting the right capacity for a facility or machine, or overbooking customers (Hill, 2011). Given its broad application range in the real world, it has captured widespread attention (e.g., see Choi's (2012) handbook on the Newsvendor problem). Notwithstanding that attention, a behavioral approach to the Newsvendor problem is fairly recent, dating back to Schweitzer and Cachon's (2000) seminal Newsvendor experiment. They run a lab experiment with both high and low profit margin products, observing that "*Subjects consistently ordered amounts lower than the expected profit-maximizing quantity for high-profit products and higher than the expected profit-maximizing quantity for low-profit products*" (p. 418). This systematic Newsvendor result is known as the *pull-to-center effect* (Bostian et al., 2008). Schweitzer and Cachon (2000) also showed that this biased order behavior cannot be completely explained by risk aversion, risk-seeking preferences, loss aversion, waste aversion, stockout aversion, and underestimation of opportunity costs. They also considered prospect theory (Kahneman and Tversky, 1979), observing that it was inadequate since in a gains-only domain, where pull-to-center effect behavior is rule out by design, subjects' order behavior was again consistent with this bias.

Given the pervasiveness of the pull-to-center effect (e.g., Bolton and Katok, 2008; de Véricourt et al., 2013; Kremer et al., 2010) and its adverse effects in terms of economic performance, subsequent lab

experiments have explored alternative explanations. For instance, Bostian et al. (2008) explored a model of adaptive learning behavior, Ho et al. (2010) explored a reference dependence model that includes asymmetric psychological costs of leftovers and shortages, and Chen et al. (2013) explored a prospective accounting model that includes underweighting of either outgoing or incoming payments, among others. Although incremental improvements have been made, “A full explanation for the Newsvendor behavior is proving to be elusive” and “It is likely that there is no single explanation” (Katok, 2010, p. 39).

Although the inventory control literature is extensive, no much work has been done to determine what psychological factors are likely to influence typical biased Newsvendor behavior. By exploring learning, reference dependence, and mental accounting, the above lab experiments provide some exceptions. We take a similar approach and explore an arguably more ubiquitous psychological factor, namely, how power affects Newsvendor order behavior. More specifically, we examine how a sense of power affects pull-to-center effect behavior.

Different researches have revealed how power often operates non-consciously and have identified the different methods and paradigms used to activate or create a psychological sense of power outside of conscious awareness (Smith and Galinsky, 2010). After all, power is a fundamental part of everyday social life and the primary method of organizing social relations (Cartwright, 1959; Fiske, 1992). Hence, given that feelings of power are present always in people lives and given that previous experiments have shown the common biases in the newsvendor setting, we would expect that power would not eliminate the typical newsvendor biased in inventory ordering behavior and that will persist.

H1: Newsvendor biases will persist even if subjects are feeling high/low/no power

People are often unaware of how the possession of power fundamentally alters basic psychological and behavioral tendencies, but indeed, power increases abstraction in thought and approach in behavior, both of which make individuals more focused on their own goals and better comprehension of the internal states (Smith and Galinsky, 2010) leading to a neutral risk preference.

In this way, and based on the experimental conclusions made by Schweitzer and Cachon (2000), we would like to test if this construct (power), widely studied in the psychological theory, really affects decision making in a newsvendor setting. If so, we could expect that feeling of power could lead to a decreasing in underperformance in the newsvendor setting. So, we could hypothesize:

H2: The higher the power felt by a subject, the lower the underperformance in the newsvendor setting.

H2a: In a newsvendor setting, the higher the power felt by a subject selling a high profit margin product, the higher the ordering decision placed by the subject.

H2b: In a newsvendor setting, the higher the power felt by a subject selling a low profit margin product, the lower the ordering decision placed by the subject.

We do not constrain the analysis to the effect of power, but we would also like to check if other theories are able to explain the biases perceived in a newsvendor problem.

Risk aversion, in general, is a plausible explanation whenever the subjects' behavior does not appear risk neutral. While risk aversion does not explain newsvendor's pull-to-center bias in the low-profit condition, De Véricourt et al. (2013) argue that it could explain the results in the high-profit newsvendor setting. They find that males make higher (more risky) orders than females, which can be explained due to differences in risk attitude.

As mentioned before, Schweitzer and Cachon (2000) also showed that pulling-to-center cannot be explained by risk aversion/risk-seeking preferences in both high and low profit conditions.

Keren and Pliskin (2006) present how risk aversion impacts a newsvendor who faces uniform demand. They find that increasing demand variability can both increase and decrease the optimal order quantity. Chen et al. (2009) derive a generic solution to newsvendor problem with random demand when both pricing and ordering are decisions taken to minimize the Conditional-Value-at-Risk measure. The results show that the risk-averse newsvendor behaves differentially from her risk-neutral counterpart (Käki et. al, 2013).

In order to avoid making assumptions about the subjects risk preferences, Holt and Laury (2002), motivated by the work done by Saha (1993), highlighted the expo-power utility function as an alternative to explain subjects' risk preferences. This utility function permits the type of increasing (or decreasing) relative risk aversion and avoids the absurd prediction of constant absolute risk aversion characteristic of other utility functions such as the exponential (Holt and Laury, 2002). From my knowledge, this expo-power utility function has not been tested yet as an alternative explanation of the previously described newsvendor biases. Hence, given the flexibilities that the expo-power utility function has, we would like to hypothesize:

H3. Expo-power utility function is able to explain newsvendor biases.

The experiment

We run a Newsvendor lab experiment in which individuals first complete a power mindset tasks and then make a one-shot inventory order decision for a general item. More specifically, we create a 2x3 full factorial between-subjects design. The factors are Profit condition and Power condition. Individuals thus make inventory order decisions under three power conditions: high (HP), low (LP) and no-power (NP), each in two profit conditions: high (HN) and low-profit (LN). Table 1 summarizes the design and the number of participants (n).

Table 1. Experimental treatments.

		Power condition		
		HP	LP	NP
Profit condition	HN	T1 (n = 25)	T2 (n = 26)	T3 (n = 15)
	LN	T4 (n = 23)	T5 (n = 26)	T6 (n = 15)

Power conditions

When individuals are activated with the construct of power, whether via actual experience in a powerful or powerless role or by mere exposure to past experiences related to power or powerlessness, the feelings and behavioral tendencies associated with power will also be activated (Bargh and Álvarez, 2001; Smith and Galinsky, 2010) and these individuals will behave similarly to individuals who actually possess power (Carney et al., 2010; Smith et al., 2008).

We manipulate power following a mindset or episodic priming task, which has been established as an effective means of activating the desired power mindset (Fast et al., 2009; Gruenfeld et al., 2008; Inesi, 2010). Specifically, individuals were given the following task according to the power condition they were assigned to:

High-power condition (HP):

"Please recall a particular incident in which you had power over another individual or individuals. By power, we mean a situation in which you controlled the ability of another person or persons to get something they wanted, or were in a position to evaluate those individuals. Please describe the situation in which you had power: events, feelings, thoughts, etc"

Low-power condition (LP):

"Please recall a particular incident in which someone had power over you. By power, we mean a situation in which someone controlled your ability to get something you wanted, or was in a position to evaluate you. Please describe the situation in which someone had power over you: events, feelings, thoughts, etc"

No-power condition (NP):

"Please recall the last time you went to the supermarket. Please choose one experience in particular to reflect upon. Describe this experience including events, feelings, thoughts, etc"

This part of the experiment is not rewarded monetarily. However, individuals are told that an improper completion of this task translates to no payment.

Profit conditions

Individuals have to choose an order quantity q of a general item, which arrives before the start of a single selling period. They know in advance that demand D follows an uniform distribution $D \sim U[1, 100]$ with integer values. They are told that they can buy each unit from a supplier at a cost c and can sell each unit at a price $p > c$. They are also told that any leftovers are salvaged at a price $s < c$ each unit. Finally, they are also reminded that they will forgo $p - c$ profits for each unit short of demand. This parameterization is consistent with related Newsvendor lab experiments (e.g., Bolton and Katok, 2008; Schweitzer and Cachon, 2000). Table 2 summarizes the information given to individuals according to the profit condition.

Table 2. Newsvendor problem parameters.

	Profit condition	
	HN	LN
D	~ U[1, 100]	~ U[1, 100]
c	40 \$/item	80 \$/item
p	100 \$/item	100 \$/item
s	20 \$/item	20 \$/item

It is well-known that the optimal inventory order quantity is a base-stock policy characterized by the critical fractile:

$$F(q^*) = \frac{p - c}{p - s} \quad (1)$$

where F is D 's cdf and q^* the optimal inventory order quantity. The above parameterization implies optimal inventory order quantities $q_{HN}^* = 75$ and $q_{LN}^* = 25$ items for high and low-profit conditions, respectively.

This part of the experiment is rewarded monetarily according to a performance function previously determined by the authors. This function is computed based on *eq. (1)*, authors' experience with Newsvendor lab experiments (e.g., Castañeda, 2013), and undergraduates' opportunity cost in Colombia.

Protocol

We followed standard experimental economics protocol (see Friedman and Cassar, 2004; Friedman and Sunder, 1994). The experiment was run with third to fifth year undergraduates from Industrial and Management Engineering at the Universidad Nacional de Colombia, Medellín, in September, 2013. Participants did not have previous experience in related experiments. They were given a set of instructions describing the different parts of the experiment. Participants were told that they would earn a variable cash amount contingent on their performance, namely between COP\$ 2'000 and COP\$ 20'500 (approx. between US\$ 1 and US\$ 10). This payoff was around twice undergraduates' opportunity cost in Colombia. The experiment ran for around 40 minutes and participants were informed about the approximate duration of the experiment before starting.

We ran the experiment with 130 participants (76 males and 54 females) with an average age of 22.12 years (SD = 2.68). They were recruited using an e-mail call through the University e-mail system. Upon arrival, participants were seated in front of computers and a treatment was assigned randomly. All the experimental information and parameters were of common knowledge to all participants. The experiment was programmed and run with the software z-Tree (Fischbacher, 2007). The software ran automatically and kept record of all variables, including participants' decisions.

Results and analyses

Power manipulation check

We first check the effectiveness of the power manipulation by performing a content analysis on the episodic tasks done by participants. Two coders with no relation to the project rated each task for each of the following questions (Van Loo and Rydell, 2013): (i) how much power does the person has in that situation? (1 = nothing at all, 5 = a lot), (ii) how much power does someone else have over the person in that situation? (1 = nothing at all, 5 = a lot), and (iii) how powerful does the writer feel? (1 = nothing at all, 5 = a lot). We also computed a Cronbach's alpha to test the scale of reliability. Results show an alpha of 0.81 and 0.87 for each one of the coders. In addition, we computed a two-way random effect intraclass correlation coefficient (ICC) to test the level of agreement between both coders. Results show and ICC of 0.86. That is, coders were highly coherent in their ratings and had a high level of agreement about the effectiveness of the power manipulation. Table 3 shows the average rates given by the coders to the first question (how much power does the person has in that situation?).

*Table 3. Coder average rating for question (i) in each power condition. **

	Power condition		
	HP	LP	NP
Average	4.34 (0.13)	1.89 (0.13)	3.98 (0.16)

* Standard errors in parentheses.

As shown in Table 3, participants facing the high/low-power condition described a situation related with higher/lower feelings of power (average rate = 4.34/1.89). However, participants facing the no-power condition showed a relative high degree of power (average rate = 3.98). This suggests that the power manipulation used (description of a day in the supermarket) is not appropriate enough to elicit feelings deprived of power; after all, power effects are ubiquitous and can have a psychological impact without individuals having actual possession of high or low power, outside an interactive situation in which power is relevant, and even outside individuals' awareness (Van Loo and Rydell, 2013).

Newsvendor results

We now analyze Newsvendor decisions across profit and power conditions. Table 5 shows participants' average behavior and optima in each treatment.

As shown in Table 4, results in the high-profit condition (HN) are consistent with typical biased Newsvendor order behavior regardless of the power manipulation. In particular, only one of the confidence intervals around average inventory order quantities contains the optimal inventory order quantity (NP). In addition, none of the confidence intervals includes the average demand. Hence, inventory order behavior in the high-profit condition is fairly consistent with the pull-to-center effect (support for **H1**).

Table 4. Optimal and average participants' Newsvendor decisions.*

	q*	Power condition		
		HP	LP	NP
Profit condition	HN	68.24 (3.38) [61.6 74.8]	65.81 (3.31) [59.3 72.2]	67.67 (4.36) [59.1 76.2]
	LN	57.96 (4.23) [49.6 66.2]	65.65 (3.98) [57.8 73.4]	64.33 (5.24) [54.0 74.6]

* Standard errors in parentheses; confidence intervals in brackets.

On the other hand, results in the low-profit condition (LN) show a more pronounced underperformance in all three treatments regardless of the power manipulation. In particular, besides the confidence intervals not containing the optimal inventory order quantity, two of them are above the average demand (LP and NP). This is consistent with an asymmetry in the pull-to-center effect observed in other Newsvendor experiments (e.g., Bolton and Katok, 2008; Schweitzer and Cachon, 2000). Hence, inventory order behavior in the low-profit condition is consistent with an asymmetric pull-to-center effect (partial support for **H1**).

Regarding power effects, Table 4 shows that participants under a high-power condition are able to make decisions which are on average closer to the optimum, i.e., powerful individuals selling a high-profit product place larger order quantities than those with low or no power, and powerful individuals selling a low-profit product place smaller order quantities than those with low or no power. However, these differences are not statistically significant (no support for **H2**, **H2a**, **H2b**).

Expo-power utility function analyses

To estimate risk attitudes and assess the importance of risk preferences, we followed the approach used by Holt and Laury (2002) and Harrison, et al. (2007) characterizing an hybrid expo-power utility function (Saha, 1993), which permits the type of increasing/decreasing relative risk aversion, but avoids the predictions of constant absolute risk aversion. In general, subjects made an ordering decision (among 100 options) and they can face an uncertain final customer demand ($\sim U[1, 100]$)

The expo-power function can be defined as:

$$U(w_{ij}) = \frac{1 - \exp(-\alpha * w_{ij}^{1-r})}{\alpha}, \forall i, j \in [1, 100] \text{ and } w_{ij} \geq 0 \quad (2)$$

Where r and α are parameters to be estimated and w_{ij} is the possible outcome when a subject place an order of i units and the realized demand is j .

Motivated by the prospect theory (Kahneman and Tversky 1979) and the previous work done by (Xie, 2000) we can extend this utility function to the losses framework

$$U(w_{ij}) = \begin{cases} \frac{1 - \exp(-\alpha * w_{ij}^{1-r})}{\alpha} & , \text{if } w_{ij} \geq 0 \\ -\lambda \frac{1 - \exp(-\alpha * (-w_{ij})^{1-r})}{\alpha} & , \text{if } w_{ij} < 0 \end{cases} \quad (3)$$

If we assume that expected utility theory holds for these choices over risky alternatives, the likelihood function for the choices that subjects make can be written for each possible order decision i as:

$$E[U_i] = \sum_{j=1}^{100} (p(w_{ij}) * U(w_{ij})), \quad \forall i \in [1, 100] \quad (4)$$

To determine conditional likelihoods on the model, the Luce stochastic specification could be implemented. The expected utility ($E[U_i(w)]$) for each possible order decision is calculated by:

$$\nabla EU_i = \frac{E[U_i]^{1/\mu}}{\sum_{k=1}^{100} E[U_i]^{1/\mu}}, \quad \forall i \in [1, 100] \quad (5)$$

Where μ is the noise that reflects actual decision-making errors or unknown heterogeneity. The conditional log-likelihood can then be written as:

$$L(\alpha, r, \mu, \lambda; i, w) = \ln \sum (\ln(\nabla EU_i) | \text{decision} = i) \quad (6)$$

Where decision = i represents the order decision in the newsvendor problem. This conditional log-likelihood function could be estimated for each treatment using maximum likelihood. Also, each parameter (α, r, μ) in this function equation is allowed to be a linear function of demographic and treatment. Given that we did not find significant differences among treatments with the same profit condition, we used all the subjects' decisions within the same profit condition in order to estimate the unknown parameters. Parameters estimations shown significant results in both high and low profit condition.

Once the parameters α, r and μ were determined, the expo-power utility function is completely characterized and we were able to determine the level and the form of risk preferences curve for the subject in each treatment. Hence, we would be able to compute the optimal inventory prepositioning behavior based on their risk preferences, as follows:

$$q_U^* = \min_q \sum_{D=0}^{q-1} U((c-s)f(D)(q-D)) + \sum_{D=q}^{Dmax} U((p-c)f(D)(D-q)) \quad (7)$$

The q_U^* obtained for each profit condition are: 68 units for the high profit condition and 38 units for the low profit condition. Values that reflect the well know pull-to-center effect and the higher perceived underperformance in the low profit condition. We have shown that the common underperformance (pull-to-center) in a newsvendor problem could be explained by subject specific beliefs and risk preferences, which could be accounted using an expo-power utility function (support for **H3**).

Conclusions, Limitations and Future Research

Despite the relevance that the feeling of power has taken in different research fields, we did not find significant effect of power in a simple managerial problem like inventory repositioning in a one shot newsvendor problem. However, results have shown a weak intuition that feeling powerful could lead to a better performance and a reduction of the common behavioral biases found in these kinds of problems. It would be interesting to run this sort of experiment with a higher number of subjects to further check for problems such as sample size or sampling selection.

We have also found that taking advantage of the expo-power utility function properties helps to explain subjects' underperformance in a newsvendor problem. However, we should check if the results obtained in these experiments can be extended to a higher sample size.

It would be also interesting to analyze in higher detail if power can affect the relative or absolute individual risk aversion and if this level of risk preferences can really affect the parameter values in the expo-power utility function

Finally, it would be also interesting to analyze the system using many periods (instead of one). However, we should be very careful in order to accurately disentangle the effect of power, the learning effect and the possible effect of power in learning.

References

- Arrow, K. J., Harris, T., Marschak, J. 1951. "Optimal Inventory Policy". *Econometrica*, 19(3): 250-272.
- Bargh, J. A., Álvarez, J. 2001. "The Road to Hell: Good Intentions in the Face of Nonconscious Tendencies to Misuse Power". In Lee-Chai, A. Y., Bargh, J. A. (Eds.), *The Use and Abuse of Power: Multiple Perspectives on the Causes of Corruption*. Philadelphia, PA: Psychological Press, 41-55.
- Bernoulli, D. 1738/1954. "Exposition of a New Theory on the Measurement of Risk". *Econometrica*, 22(1): 23-36.
- Bolton, G. E., Katok, E. 2008. "Learning by Doing in the Newsvendor Problem: A Laboratory Investigation of the Role of Experience and Feedback". *Manufacturing & Service Operations Management*, 10(3): 519-538.
- Bostian, A. A., Holt, C. A., Smith, A. M. 2008. "Newsvendor "Pull-to-Center" Effect: Adaptive Learning in a Laboratory Experiment". *Manufacturing & Service Operations Management*, 10(4): 590-608.
- Carney, D. R., Cuddy, A. J. C., Yap, A. J. 2010. "Power Posing: Brief Nonverbal Displays Affect Neuroendocrine Levels and Risk Tolerance". *Psychological Science*, 21(10): 1363-1368.

- Cartwright, D. 1959. "Power: A Neglected Variable in Social Psychology". In Cartwright, D. (Ed.), *Studies in Social Power*. Ann Arbor, MI: University of Michigan, 1-14.
- Castañeda, J. A. 2013. "Essays on Biased Newsvendor Ordering Behavior Based on Laboratory Experiments". Ph.D. Dissertation, Università della Svizzera italiana (USI, Lugano). Lugano, Switzerland.
- Chen, L., Kök, A. G., Tong, J. D. 2013. "The Effect of Payment Schemes on Inventory Decisions: The Role of Mental Accounting". *Management Science*, 59(2): 436-451.
- Chen, Y., Xu, M., Zhang, Z. G. 2009. "A Risk-Averse Newsvendor Model under the CVaR Criterion". *Operations Research*, 57(4): 1040-1044.
- Choi, T.-M. 2012. "Handbook of Newsvendor Problems: Models, Extensions and Applications". New York, NY: Springer.
- Croson, R., Croson, D., Ren, Y. 2011. "The Overconfident Newsvendor". Working paper, University of Texas at Dallas. Richardson, TX.
- Edgeworth, F. Y. 1888. "The Mathematical Theory of Banking". *Journal of the Royal Statistical Society*, 51(1): 113-127.
- Eeckhoudt, L., Gollier, C., Schlesinger, H. 1995. "The Risk-Averse (and Prudent) Newsboy". *Management Science*, 41(5): 786-794.
- de Véricourt, F., Jain, K., Bearden, J. N., Filipowicz, A. 2013. "Sex, Risk and the Newsvendor", *Journal of Operations Management*, 31(1-2): 86-92.
- Fast, N. J., Gruenfeld, D. H., Sivanathan, N., Galinsky, A. D. 2009. "Illusory Control: A Generative Force behind Power's Far-Reaching Effects". *Psychological Science*, 20(4): 502-508.
- Fischbacher, U. 2007. "z-Tree: Zurich Toolbox for Ready-Made Economic Experiments". *Experimental Economics*, 10(2): 171-178.
- Fiske, A. P. 1992. "The Four Elementary Forms of Sociality: Framework for a Unified Theory of Social Relations". *Psychological Review*, 99(4): 689-723.
- Friedman, D., Cassar, A. 2004. "Economics Lab: An Intensive Course in Experimental Economics". London: Routledge.
- Friedman, D., Sunder, S. 1994. "Experimental Methods: A Primer for Economists". Cambridge: Cambridge University Press.
- Galinsky, A. D., Gruenfeld, D. H., Magee, J. C. 2003. "From Power to Action". *Journal of Personality and Social Psychology*, 85(3): 453-466.

- Gonçalves, P., Castañeda, J. A., Joglekar N. 2013. "Ambitious Design Goals and Stretched Resource Allocation: Investigation of Managerial Biases under Innovation Uncertainty". Working paper, Università della Svizzera italiana (USI, Lugano). Lugano, Switzerland.
- Gruenfeld, D. H., Inesi, M. E., Magee, J. C., Galinsky, A. D. 2008. "Power and the Objectification of Social Targets". *Journal of Personality and Social Psychology*, 95(1): 111-127.
- Harrison, G. W., Johnson, E., McInnes, M. M., Rutström, E. E. 2005. "Risk Aversion and Incentive Effects: Comment". *American Economic Review*, 95(3): 897-901.
- Hill, A. V. 2011. "The Newsvendor Problem". White Paper 57-23, Clamshell Beach Press. Eden Prairie, MN.
- Ho, T.-H., Lim, N., Cui, T.-H. 2010. "Reference Dependence in Multilocation Newsvendor Models: A Structural Analysis". *Management Science*, 56(11): 1891-1910.
- Holt, C. A., Laury, S. K. 2002. "Risk Aversion and Incentive Effects". *American Economic Review*, 92(5): 1644-1655.
- Holt, C. A., Laury, S. K. 2005. "Risk Aversion and Incentive Effects: New Data without Order Effects". *American Economic Review*, 95(3): 902-904.
- Inesi, M. E. 2010. "Power and Loss Aversion". *Organizational Behavior and Human Decision Processes*, 112(1): 58-69.
- Käki, A., Liesiö, J., Salo, A., Talluri, S. 2013. "Newsvendor Decisions under Supply Uncertainty". Working paper, Aalto University. Espoo, Finland.
- Kahneman, D., Tversky, A. 1979. "Prospect Theory: An Analysis of Decision under Risk". *Econometrica*, 47(2): 263-292.
- Katok, E. 2010. "Using Laboratory Experiments to Build Better Operations Management Models". *Foundations and Trends in Technology, Information and Operations Management*, 5(1): 1-84.
- Keren, B., Pliskin, J. S. 2006. "A Benchmark Solution for the Risk-Averse Newsvendor Problem". *European Journal of Operational Research*, 174(3): 1643-1650.
- Kremer, M., Minner, S., van Wassenhove, L. N. 2010. "Do Random Errors Explain Newsvendor Behavior?". *Manufacturing & Service Operations Management*, 12(4): 673-681.
- Olivares, M., Terwiesch, C., Cassorla, L. 2008. "Structural Estimation of the Newsvendor Model: An Application to Reserving Operating Room Time". *Management Science*, 54(1): 41-55.
- Ren, Y., Croson, R. 2013. "Overconfidence in Newsvendor Orders: An Experimental Study". *Management Science*, in press.
- Saha, A. 1993. "Expo-Power Utility: A 'Flexible' Form for Absolute and Relative Risk Aversion". *American Journal of Agricultural Economics*, 75(4): 905-913.

- Schweitzer, M. E., Cachon, G. P. 2000. "Decision Bias in the Newsvendor Problem with a Known Demand Distribution: Experimental Evidence". *Management Science*, 46(3): 404-420.
- Smith, P. K., Galinsky, A. D. 2010. "The Nonconscious Nature of Power: Cues and Consequences". *Social and Personality Psychology Compass*, 4(10): 918-938.
- Smith, P. K., Wigboldus, D. H. J., Dijksterhuis, A. 2008. "Abstract Thinking Increases One's Sense of Power". *Journal of Experimental Social Psychology*, 44(2): 378-385.
- Su, X. 2008. "Bounded Rationality in Newsvendor Models". *Manufacturing & Service Operations Management*, 10(4): 566-589.
- Van Loo, K. J., Rydell, R. J. 2013. "On the Experience of Feeling Powerful: Perceived Power Moderates the Effect of Stereotype Threat on Women's Math Performance". *Personality and Social Psychology Bulletin*, 39(3): 387-400.
- Weatherford, L. R., Pfeifer, P. E. 1994. "The Economic Value of Using Advance Booking of Orders". *Omega*, 22(1): 105-111.
- Xie, D. 2000. "Power Risk Aversion Utility Functions". *Annals of Economics and Finance* 1, 265- 282.