MALEK BEN SLIMAN

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EDUCATION

Ph.D. Candidate in Marketing   Expected May 2020
Columbia University, Graduate School of Business – Marketing, New York, NY
Dissertation: "The Art of Art Valuation"
Advisors: Professors Kohli and Jedidi

Master of Science in Operations Research   2014
Columbia University, Industrial Engineering and Operations Research, New York, NY

Master of Science in Engineering – Diplôme d'Ingénieur   2013
Ecole Centrale Paris, Industrial Engineering, Paris, France

Classes Préparatoires   2011
Lycée Louis Le Grand, Mathematics – Physics, Paris, France

HONORS AND AWARDS

- AMA-Sheth Foundation Doctoral Consortium Fellow (2019)
- Luxury Education Foundation Award (2019)
- INFORMS Doctoral Consortium Fellow (2018)
- Quantitative Marketing and Structural Econometrics Workshop Fellow (2017)
- Ph.D. Program Fellowship, Columbia University (2015-Present)
- IEOR Outstanding Student Service Award, Columbia University (2014)
- Excellence-Major Scholarship, French Government (2008-2013)

RESEARCH INTERESTS

- Topics: Social Networks, Diffusion of Information and Word-of-Mouth, Art Valuation, Customer Analytics
- Methods: Graph Theory, Empirical Modeling, Bayesian Statistics, Econometrics, Unstructured Data, Machine Learning

WORKING PAPERS

Ben Sliman, Malek and Rajeev Kohli (2019), "Friendship Paradox Generalizations and Centrality Measures," under review with *Social Networks*.

> The friendship paradox says that on average your friends have more friends than you. Equivalently, in an undirected graph, the average degree of the nodes is no greater than the average degree of the terminal node of a random walk of length one. We generalize this result in two ways: (1) by considering directed graphs, which also allow one-sided relations, such as between followers and leaders; and (2) by characterizing the relations between the expected values of the in and out degrees of the terminal nodes of random alternating walks of length $2k$ and $2k+1$, where $k \geq 0$. The limiting value of these averages is proportional to the largest singular value of the associated adjacency matrix, and to its largest eigenvalue in the special case of an undirected graph. We interpret the results for one-sided relations (e.g., between leaders and followers) and two-sided relations (e.g., between friends). We further relate such extension to centrality measures. We show that beta centrality approaches eigenvector centrality when the inverse of the weighting parameter becomes arbitrarily close to the limiting value of the expected degree of the terminal node of a random walk of length k. When relations are asymmetric, this observation extends to the singular vectors of the associated directed graph.

Ben Sliman, Malek, Khaled Boughanmi and Rajeev Kohli (2019), "Adaptive Customization," under review with *Management Science*.

Most online retailers and content providers offer feature-based filtering tools to facilitate product search by their customers. We propose a method that learns about a customer's preferences each time he/she selects a screening feature, and then customizes the screening menu and displays the filtered alternatives in suitable order. It also allows a retailer to create adaptive displays showing the best alternatives for a highlighted feature. The proposed method has an offline component that estimates the parameters of a latent-class screening model, and an online component that uses Bayes' theorem to dynamically predict the sequential filtering of alternatives. We describe estimation procedures and illustrate adaptive customization using data from a choice experiment for electronic tablets.

Jedidi, Kamel, Bernd Schmitt, Malek Ben Sliman and Yanyan Li (2019), "R2M Index 1.0: Assessing the Relevance to Marketing of Academic Marketing Research," revision invited at *Journal of Marketing*.

Has marketing academia lost its relevance for marketing practice? To move beyond the long-lasting conceptual debate, this article assesses this question empirically by employing a text-mining methodology on academic marketing articles. We develop version 1.0 of the R2M (Relevance to Marketing) Index and validate it against external measures: the index correlates with relevance measures, such as practice awards and practitioner evaluations of articles, and articles in marketing journals have a higher score than articles in disciplinary journals in psychology and economics. Moreover, we find that articles published in the *Journal of Marketing* have the highest R2M score followed by *Marketing Science*, *Journal of Marketing Research*, and *Journal of Consumer Research*. We suggest that journal editors and authors use the R2M Index to assess the relevance of an article, and marketing practitioners to identify relevant articles. Because the index will always be a work in progress that requires continuous improvement, we discuss how to overcome limitations by including more journals, designing further safeguards against "gaming the system," and moving from relevance to business impact.

WORK IN PROGRESS

Ben Sliman, Malek and Rajeev Kohli (2019), "Leveraging the Friendship Paradox for Seeding in Asymmetric Networks," to be submitted at *Management Science*.

A critical assumption of the friendship paradox is the symmetry of the relationship. That is, if two people are friends, then each is the other's friend. In social networks like Facebook where this assumption is satisfied, the friendship paradox implies that firms can potentially achieve faster and more widespread diffusion of information by seeding it with the friends of a group of people than with people in the group itself. We generalize the result to allow one-sided (leader/follower) relations and examine the implications for seeding in social networks like Twitter where messages (such as tweets) can be transmitted in only one direction, from leaders to followers. We use the results to compare seeding with (1) leaders, (2) followers, and (3) "friends," a sample of users selected by ignoring the asymmetry in relations. We obtain necessary and sufficient conditions under which each of three seeding methods obtains the highest number of followers per seed. We analyze a subset of Twitter data and find that seeding with leaders performs better than the other two methods.

Ben Sliman, Malek, Rajeev Kohli and Kamel Jedidi (2019), "The Art of Art Valuation."

Wealthy consumers increasingly invest in art which is considered as a more individualistic and exclusive form of luxury consumption. This trend is notably illustrated by the collaborations between luxury companies and famous artists. Yet, the drivers of the financial value of pieces of art are not fully understood. Indeed, even major auction houses are at awe when paintings are sold at prices multiple times higher than what they expected. The purpose of this paper is to deepen our understanding of the art world by investigating the drivers of art valuation.

We collected details regarding over 140,000 fine art auction including the paintings' images to address the following questions. First, we use deep learning tools to assess which visual features predict auction prices. Second, we create a network of paintings to establish how creative and influential each painting is. Finally, we shift our focus to artists and model the evolution of artists' reputations over time.

CONFERENCE PRESENTATIONS

- "Adaptive Customization," *Data Science Institute – Financial and Business Analytics Center – Poster Session*, New York, NY, November 2019
- "Adaptive Customization," *Marketing Science*, Rome, Italy, June 2019
- "Leveraging the Friendship Paradox for Seeding in Asymmetric Networks," *Marketing Science*, Philadelphia, PA, June 2018

EXPERIENCE

Columbia University – Research Assistant to Professor Jedidi   New York, NY
Assessing the Relevance to Marketing of Academic Marketing Research   May 2014 – Aug. 2015
Started a project to build an index of relevance to practice of academic marketing papers
Created robust multithread crawlers to scrape over 10,000 published papers in top marketing journals
Developed customized stemming procedure to preprocess raw data for Latent Dirichlet Allocation
Ecole Centrale Paris – Supply Chain Chair   Paris, France
RFID in Supply Chain of Retail Industries   Sept. 2012 – Jan. 2013
Analyzed the advantages of RFID usage for costs reduction in the retail industry in a 3-person team
Modeled the relationship between information and holding costs in cross-docking using queuing theory
Simulated the impact of RFID driven information gain on the holding costs of cross-docking operations
EDF ("Electricité de France") & Ecole Centrale Paris   Paris, France
Identification, metering and billing of energy consumption of electric vehicle   Sept. 2011 – June 2012
Predicted the evolution of the electric vehicle market in a 5-person team for the French utility company
Estimated the impact on the energy demand and potential costs using time series extrapolation
Prepared risk scenarios and strategic plans to help EDF anticipate the increase in energy demand

COURSEWORK AND TEACHING EXPERIENCE

- Doctoral Coursework: Multivariate Statistics, Optimization, Random Graph Theory, Economic Theory, Econometrics, Bayesian Methods, Mathematical Models in Marketing, Empirical Models in Marketing, Consumer Behavior, Marketing Decisions and Methods, Causal Inference, Industrial Organization, Stochastic Models, Analytical Models
- Languages:
  - Computer: R, Python, Matlab, Stan, Mathematica, SQL
  - Human: French, Arabic, Spanish (basic)
- Teaching Experience:
  - Teaching Assistant: Marketing, Pricing Strategies, Marketing Strategy, Marketing Models, Applied Multivariate Statistics, Mathematical Models in Marketing, Catching Growth Waves in Emerging Markets, Digital Marketing, edX Marketing Analytics
  - Tutorials: Introduction to programming in SAS, Introduction to programming in R

EXTRACURRICULAR ACTIVITIES

- Tennis:
  - Winner Tennis League Men's Competitive 2 (Fall 2017)
  - Captain of the Tennis team at Ecole Centrale Paris (2012-2013)
- Wine Tasting and Mixology:
  - Certification in Mixology provided by Columbia Bartending Agency (2014)
  - President of the Wine Club at Ecole Centrale Paris (2011-2013)
- Co-Founder and Vice-Captain of the Centrale Cricket Club (2012-2013)