BUSML 8252 Marketing Models

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Class Schedule and Location

T Noon–3PM Fisher 500: 8/22/2017 - 10/3/2017
T 2PM– 5PM Fisher 500: 10/11/2017 - 12/6/2017 (1st term final on Oct. 11th)

Description

BUSML 8252 will focus on recent developments of quantitative methods in marketing. The course is targeted to students interested in developing a conceptual understanding of quantitative models and an appreciation of the literature in this area. Quantitative models aim to explain consumer and firm behaviors and their relationship to managerial decision making. This course surveys quantitative research in marketing, with a **focus on statistical and game-theoretic models**. It covers statistical, economic and game-theoretic as well as quantitative psychological models. The main focus is on economic models of choice.

The goal of the course is to a) raise students' awareness of this literature and b) stimulate new research interests. By the end of the course, students should be familiar with the key issues and approaches in quantitative marketing, the strengths of these research streams, and the opportunities to extend them.

Approach

We meet each week for 3-4 hours. Each week is dedicated to one major topic. For each topic, there is an extensive list of related papers. We will spend the majority of time reviewing 3-4 papers in depth. All starred papers (* and **) have to be carefully read by all students. For suggestions on reading these articles, please see Vithala Rao's how-to-read tutorial in the Appendix to this syllabus.

Papers marked '*' will be presented by students. From week 1 on, 2-3 students will give presentations on required papers for discussion. We would like students to work in teams of two. Teams and papers will be assigned during the initial class.

Papers marked '**' will be thoroughly discussed in class, yet are not presented by student teams. Non-presenting students are expected to submit a short summary of these papers (* and **) on Canvas for everyone to read. The first portion of the class may be used for a short review of the

previous week and a brief discussion on extension. Next, we will have student presentations and classroom discussion on all required papers. The last portion of the class will be spent integrating the days' readings. The class will be largely discussion oriented.

Overview of Course Requirements

Students are expected to fulfill the following tasks:

- Team presentations of papers indicated on the reading list (the number of presentations may vary with the number of participants, approximately 3-4)
- Written summaries of required papers (due when not presenting)
- Research Proposal (focus on identifying gaps in the literature of your interest and positioning your research question within the literature)

Details of Requirements

Each student is expected to read the required reading to be discussed. In addition, students are expected to pursue additional optional readings as time permits to obtain a broader sense of research in the area. Every week, students will be assigned to write a one page summary of a given paper for the edification of themselves and their peers. Only students not presenting that week will be assigned. These summaries should be distributed to all persons in the class, and include:

- objective of the paper,
- its unique contribution,
- why it is important,
- hypotheses if any,
- assumptions in the model,
- key equations,
- key findings,
- key limitations, and
- opportunities to extend the work.

Also, students have to give short presentations of additional papers.

Each participant will also be required to hand in a one page summary of all the required readings for the week (how they inter-relate, what the key questions are, what issues have been resolved, and what issues remain open). In addition, the write-up should contain answers to each of the questions (A-K) listed in the Appendix on the last page of this syllabus.

Finally, at the end of the semester, students will hand in a research proposal that extends the work of a paper from the reading list. The proposal should outline why the idea is important, how it is different from existing work, and conceptually present a model to implement the idea. The introduction, identification of any gap in the literature and positioning of your research question should receive the most attention for this task.

Overview of topics covered

1. Economic Foundations of Choice Models (Joo)
2. Models of Strategic Market Place Behavior I (Joo)
3. Models of Strategic Market Place Behavior II (Joo)
4. Information Search (Joo)
5. Dynamic Models of Discrete Choice (Joo)
6. Advertising I: Quasi-experiments (Joo)
7. Advertising II: Field-experiments (Joo)
8. Model building and review process (Hardt)
9. Economic, Psychometric, and Descriptive models, Causality (Hardt)
10. Customer Lifetime Value Models (Hardt)
11. Models of Survey Response (Hardt)
12. Product Design, Conjoint Applications, Direct Utility Framework (Hardt)
13. Individual vs. Aggregate Models of Demand (Hardt)
14. 'Big Data' and emerging trends (Hardt)

Course Schedule (* denotes papers for student presentation, and ** denotes papers for discussion.)

Week 1: Economic Foundations of Choice Models (by Joo)

Required for class:

- *Chandukala, Sandeep R., Jaehwan Kim, Thomas Otter, Peter E. Rossi and Greg M. Allenby (2008), "Choice Models in Marketing," in *Foundations and Trends in Marketing*, Now Publishers.
- *Chintagunta, Pradeep K. and Harikesh S. Nair (2011), "Discrete-Choice Models of Consumer Demand in Marketing," *Marketing Science*, 30(6), 977-996.

Recommended:

- Keane, Michael P. (2010), "Structural vs. Atheoretic Approaches to Econometrics," *Journal of Econometrics*, 156 (1), 3–20.
- Rust, John (2014), "The Limits of Inference *with* Theory: A Review of Wolpin (2013)," *Journal of Economic Literature*, 52(3), 820-850.
- Reiss, Peter C. and Frank A. Wolak (2005), "Structural Econometric Modeling: Rationale and Examples from Industrial Organization," prepared for the *Handbook of Econometrics*, Vol. 6. **Pages 1-37** and **Pages 88-110** only.

Week 2: Models of Strategic Market Place Behavior I (by Joo)

Required for class:

- *Yang, Sha, Yuxin Chen and Greg M. Allenby (2003) "Bayesian Analysis of Simultaneous Demand and Supply," *Quantitative Marketing and Economics*, 1, 251-304.
  - *Including all discussion papers*.
- *Rossi, Peter E. (2014), "Even the Rich Can Make Themselves Poor: a Critical Examination of the Use of IV Methods in Marketing," *Marketing Science*, 33(5), 655-672.
- **Franses, Philip Hans (2005), "On the Use of Marketing Models for Policy Simulation in Marketing," *Journal of Marketing Research*, 42(1), 4-14.
- **Bronnenberg, Bart J., Peter E. Rossi, and Naufel J. Vilcassim (2005), "Structural Modeling and Policy Simulation," *Journal of Marketing Research*, 42(1), 22-26.

Note: If you are not familiar with Berry, Levinsohn, and Pakes (1995), you must read Gordon's slides on Carmen.

Recommended:

- Jiang, Renna, Puneet Manchanda, and Peter Rossi (2009), "Bayesian Analysis of Random Coefficient Logit Models Using Aggregate Data," *Journal of Econometrics*, 149, 136-148.
- Otter, Thomas, Timothy J. Gilbride, and Greg M. Allenby (2011), "Testing Models of Strategic Behavior Characterized by Conditional Likelihoods," *Marketing Science*, 30(4), 686-701.

Week 3: Models of Strategic Market Place Behavior II (by Joo)

Required for class:

- **McGuire, Timothy and Richard Staelin (1983), "An Industry Equilibrium Analysis of Downstream Vertical Integration," *Marketing Science*, 2(2), 161-191.
- *Dong, Xiaojing, Puneet Manchanda, and Pradeep K Chintagunta (2009), "Quantifying the Benefits of Individual-Level Targeting in the Presence of Firm Strategic Behavior," *Journal of Marketing Research*, 46(2), 207-22.
- *Dube, Jean-Pierre, Gunter Hitsch, and Peter E. Rossi (2009), "Do Switching Costs Make Markets Less Competitive," *Journal of Marketing Research*, 46, 435-445.

Recommended:

- Ellickson, Paul B. and Sanjog Misra (2011), "Estimating Discrete Games," *Marketing Science*, 30(6), 997-1010.
- Draganska, Michaela, Sanjog Misra, Victor Aguirregabiria, Pat Bajari, Liran Einav, Paul Ellickson, Dan Horsky, Sridhar Narayanan, Yesim Orhun, Peter Reiss, Katja Seim, Vishal Singh, Raphael Thomadsen, and Ting Zhu (2008), "Discrete choice models of firms' strategic decisions," *Marketing Letters*, 19, 399-416.
- Rossi, Peter E., Robert E. McCulloch and Greg M. Allenby (1996), "The Value of Purchase History Data in Target Marketing" *Marketing Science*, 15(4), 321-340.

Week 4: Information Search (by Joo)

Required for class:

- **Weitzman, Martin L. (1979), "Optimal Search for The Best Alternative," *Econometrica*, 47(3), 641-654.
- *Moorthy, Sridhar, Brian T. Ratchford, and Debabrata Talukdar (1997), "Consumer Information Search Revisited: Theory and Empirical Analysis," *Journal of Consumer Research*, 23 (4), 263-77.
- *Joo, Mingyu, Greg M. Allenby, and Michael L. Thompson (2017), "Optimal Product Design by Sequential Experiments in High Dimensions," *Working Paper*. (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2711333)

Recommended:

- Stigler, George J. (1961), "The Economics of Information," *The Journal of Political Economy*, 69 (3), 213-25.
- De Los Santos, Barbur, Ali Hortacsu, and Matthijs Wildenbeest (2012), "Testing Models of Consumer Search using Data on Web Browsing and Purchasing Behavior," *American Economic Review*, 102(6), 2955-80.
- Yao, Song, and Carl F. Mela (2011), "A Dynamic Model of Sponsored Search Advertising," *Marketing Science*, 30, 447-468.

Week 5: Dynamic Models of Discrete Choice (by Joo)

Required for class:

- *Rust, John (1987), "Optimal Replacement of GMC Bus Engines: An Empirical Model of Harold Zurcher," *Econometrica*, 55(5), 999-1033.
- *Misra, Sanjog and Harikesh Nair (2011), "A Structural Model of Sales-force Compensation Dynamics: Estimation and Field Implementation," *Quantitative Marketing and Economics*, 9(3), 211-225.
- **Ching, Andrew, Susumu Imai, Masakazu Ishihara, and Neelam Jain (2009), "A Practitioner's Guide to Bayesian Estimation of Discrete Choice Dynamic Programming Models," *Quantitative Marketing and Economics*, 10(2), 151-196.

Recommended:

- Imai, Susumu, Neelam Jain, and Andrew Ching (2009), "Bayesian Estimation of Dynamic Discrete Choice Models," *Econometrica*, 77(6), 1865-1899.
- Aguirregabiria, Victor and Pedro Mira (2010), "Dynamic Discrete Choice Structural Models: A Survey," *Journal of Econometrics*, 156, 38-67.

Week 6: Advertising I: Quasi-experiments (by Joo)

Required for class:

- *Goldfarb, Avi and Catherine E. Tucker (2014), "Conducting Research with Quasi-Experiments: A Guide for Marketers," *Working Paper*. (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2420920)
- **Joo, Mingyu, Kenneth C. Wilbur, Bo Cowgill, and Yi Zhu (2014), "Television Advertising and Online Search," *Management Science*, 60(1), 56-73.
- *Liaukonyte, Jura, Thales Teixeira, and Kenneth C. Wilbur (2015), "Television Advertising and Online Shopping," *Marketing Science*, 34(3), 311-330.

Recommended:

- Joo, Mingyu, Kenneth C. Wilbur, and Yi Zhu (2016), "Effects of TV Advertising on Keyword Search," *International Journal of Research in Marketing*, 33(3), 508-523.

Week 7: Advertising II: Field-experiments (by Joo)

Required for class:

- **Lambrecht, Anja and Catherine E. Tucker (2015), "Field Experiments in Marketing," *Working Paper*. (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2630209)
- *Lewis, Randall A. and Justin M. Rao (2015), "The Unfavorable Economics of Measuring the Returns to Advertising," *Quarterly Journal of Economics*, 130(4), 1941-1973.
- *Johnson, Garrett A., Randall A. Lewis, and Elmar Nubbemeyer (2017), "Ghost Ads: Improving the Economics of Measuring Ad Effectiveness." *Journal of Marketing Research*, forthcoming.

Recommended:

- Blake, T., C. Nosko, and S. Tadelis (2015), "Consumer Heterogeneity and Paid Search Effectiveness: A Large Scale Field Experiment," *Econometrica*, 83(1), 155-174.

Week 8: Model building and review process

Review papers

- ***Wedel, Michel and P. K. Kannan (2016), "Marketing Analytics for Data-Rich Environments," Journal of Marketing, 80 (6), 97–121.**
- ***Shugan, Steven M. (2003): Editorial: Defining Interesting Research Problems. In Marketing Science 22 (1), 1–15.**
- **Leeflang, Peter S. H. and Dick R. Wittink (2000), "Building models for marketing decisions: Past, present and future," *Marketing Modeling on the Threshold of the 21st Century*, 17 (2–3), 105–126.
- **Coughlan, Anne T, S. C. Choi, Wujin Chu, Charles A. Ingene, Sridhar Moorthy, V. Padmanabhan, Jagmohan S. Raju, David A. Soberman, Richard Staelin and Z. J. Zhang (2010), "Marketing modeling reality and the realities of marketing modeling," *Marketing Letters*, 21 (3), 317–333.
- Lehmann, Donald R.; Netzer, Oded; Toubia, Olivier (2015): The Future of Quantitative Marketing: Results of a Survey. In *Cust. Need. and Solut.* 2 (1), 5–18.
- Wedel, Michel, Wagner Kamakura and Ulf Böckenholt (2000), "Marketing data, models and decisions," International Journal of Research in Marketing, 17 (2-3), 203–208.

Peer Review process

- Hardt, N., Alex Varbanov and Greg M. Allenby (2016) Monetizing Ratings Data for Product Research, *Marketing Science* 35(5), pp. 713-726

Week 9: Structural and descriptive models, Causality

- **Guo, Liang (2006), "Removing the Boundary between Structural and Reduced-Form Models," *Marketing Science*, 25 (6), 629–632.

Statistical Models (Stochastic Models, Hazard Models, Time Series, Spatial, Market-level, NEIO)

- ***Reiss, Peter C. (2011), "Descriptive Structural and Experimental Methods in Marketing Research," Marketing Science, 30 (6), 950-964.**
- Lehmann, Donald R., Leigh McAlister and Richard Staelin (2011), "Sophistication in Research in Marketing," Journal of Marketing, 75, July, 155-165.
- Chintagunta, Pradeep, Tulin Erdem, Peter Rossi, and Michel Wedel (2006), "Structural Modeling in Marketing: Review and Assessment," 25, 6 (November-December), 604-616 (please also read attached commentaries by Mazzeo and Srinivasan).
- Leeflang, P. S. H. and D. R. Wittink (2000), "Building Models for Marketing Decisions: Past, Present and Future", *International Journal of Research in Marketing*, 17, 105-126.
- Winer, R. S. (2000), "Comment on Leeflang and Wittink", *International Journal of Research in Marketing*, 17, 141-145.
- Carroll, J.D. and P.E. Green (1997), "Psychometric Methods in Marketing Research: Part II, Multidimensional Scaling," *Journal of Marketing Research*, 34 (May), 193-204.

- Chapters 1 and 2 from An Introduction to Statistical Modelling, by Wojtek J Krzanowski, Arnold publishers, 1998.
- Elements of Model Building, Chapter 5 from *Building Models for Marketing Decisions*, by Leeflang, Wittink, Wedel and Naert, Kluwer Academic Press, 2000.
- Hanssens, Dominique M., Peter S.H. Leeflang, Dick R. Wittink, Market Response Models and Marketing Practice Forthcoming, *Applied Stochastic Models in Business and Industry*, 2004
- Varian, Hal R. (1994), "How to Build an Economic Model in Your Spare Time," working paper, University of California, Berkeley.
- Wedel, M., W. Kamakura, and U. Böckenholt (2000), "Marketing Data, Models and Decisions", *International Journal of Research in Marketing*, 17, 203-208.

Analytical Models

- ***Moorthy, K. S. (1993), "Theoretical Modeling in Marketing," Journal of Marketing, 57 (April), 92-106.**
- Gibbons, R. (1997), "An Introduction to Applicable Game Theory," *Journal of Economic Perspectives*, 11 (1), 127-149.
- Moorthy, K. S. (1985), "Using Game Theory to Model Competition," *Journal of Marketing Research*, 22 (August), 262-282.
- Brandenburger, A. (1992), "Knowledge and Equilibrium in Games," *Journal of Economic Perspectives*, 6(4), 83-101
- Goeree, Jacob K and Charles Holt (2001), "Ten Little Treasures of Game Theory and Ten Intuitive Contradictions," *American Economic Review*, vol. 91, no. 5, pp. 1402-22.

Causal Modeling

- **Shugan, S. M. (2007): Editorial Causality, Unintended Consequences and Deducing Shared Causes. In *Marketing Science* 26 (6), pp. 731–741.
- Pearl, Judea (2013), "Linear Models: A Useful "Microscope" for Causal Analysis," *Journal of Causal Inference*, 1 (1).
- Pearl, Judea (2000), *Causality*. *Models, reasoning, and inference.* Cambridge, U.K, New York: Cambridge University Press.
- Spirtes, Peter, Clark N. Glymour and Richard Scheines (2000), *Causation, prediction, and search. Adaptive computation and machine learning.* Cambridge, Mass: MIT Press.
- Hulland, John, Yiu H. Chow and Shunyin Lam (1996), "Use of causal models in marketing research: A review," *International Journal of Research in Marketing*, 13 (2), 181–197.
- Lee, Soonmook; Hershberger, Scott (1990): A Simple Rule for Generating Equivalent Models in Covariance Structure Modeling. In *Multivariate Behavioral Research* 25 (3), pp. 313–334.
- Steenkamp, Jan-Benedict E. M. and van Trijp, Hans C. M. (1991), "The use of lisrel in validating marketing constructs," *International Journal of Research in Marketing*, 8 (4), 283–299.
- Pearl, Judea (2000), *Causality*. *Models, reasoning, and inference.* Cambridge, U.K, New York: Cambridge University Press.
- Spirtes, Peter, Clark N. Glymour and Richard Scheines (2000), *Causation, prediction, and search. Adaptive computation and machine learning.* Cambridge, Mass: MIT Press.

Week 10: Customer Lifetime Value Models

CLV models

- ***Fader, Peter S., Bruce G.S. Hardie and Ka Kok Lee (2005), "RFM and CLV: Using Iso-Value Curves for Customer Base Analysis," *Journal of Marketing Research*, 42 (4), 415-430.**
- **Gupta, Sunil, Donald R. Lehmann, and Jennifer Stuart (2004), "Valuing Customers," *Journal of Marketing Research*, Journal of Marketing Research, 41, 1(February), 7-18.
- **Jen, Lichung, Chien-Heng Chou and Greg M. Allenby (2009), "The Importance of Modeling Temporal Dependence of Timing and Quantity in Direct Marketing," *Journal of Marketing Research*, 46 (4), 482–493.
- Neslin, Scott A, Gail A. Taylor, Kimberly D. Grantham and Kimberly R. McNeil (2013), "Overcoming the "recency trap" in customer relationship management," *Journal of the Academy of Marketing Science*, 41 (3), 320–337.
- Borle, S, S. S. Singh and D. C. Jain (2008), "Customer Lifetime Value Measurement," *Management Science*, 54 (1), 100–112.
- Gupta, S, D. Hanssens, B. Hardie, W. Kahn, V. Kumar, N. Lin, N. Ravishanker and S. Sriram (2006), "Modeling Customer Lifetime Value," Journal of Service Research, 9 (2), 139–155.
- Ascarza, Eva, Raghuram Iyengar and Martin Schleicher (2015), "The perils of proactive churn prevention using plan recommendations. Evidence from a field experiment," *Journal of Marketing Research* (forthcoming)

Dynamic models

- ***Oded Netzer, James M. Lattin, and V. Srinivasan (2008), "A Hidden Markov Model of Customer Relationship Dynamics," *Marketing Science*, 27(March-April): 185 - 204.**
- Zhang, Yao, Eric T. Bradlow and Dylan S. Small (2015), "Predicting Customer Value Using Clumpiness. From RFM to RFMC," *Marketing Science*, 34 (2), 195–208.
- Ma, Shaohui and Joachim Büschken (2011), "Counting your customers from an "always a share" perspective," *Marketing Letters*, 22 (3), 243–257.

Buy-till-die models

- **Fader, Peter S, Bruce G. S. Hardie and Ka L. Lee (2005), ""Counting Your Customers" the Easy Way: An Alternative to the Pareto/NBD Model," *Marketing Science*, 24 (2), 275–284.
- Ascarza, Eva and Bruce G. S. Hardie (2013), "A Joint Model of Usage and Churn in Contractual Settings," *Marketing Science*, 32 (4), 570–590.
- Fader, Peter S, Bruce G. S. Hardie and Jen Shang (2010), "Customer-Base Analysis in a Discrete-Time Noncontractual Setting," *Marketing Science*, 29 (6), 1086–1108.
- Braun, M. and D. A. Schweidel (2011), "Modeling Customer Lifetimes with Multiple Causes of Churn," *Marketing Science*, 30 (5), 881–902.
- Schmittlein, David C, Donald G. Morrison and Richard Colombo (1987), "Counting Your Customers: Who Are They and What Will They Do Next?," *Management Science*, 33 (1), 1–24.
- Fader, Peter S. and Bruce G.S. Hardie (2000), Applied Probability Models in Marketing Research (Supplementary Materials for the A/R/T Forum Tutorial), Working Paper, London Business School
- Jerath, K, P. S. Fader and B. G. S. Hardie (2011), "New Perspectives on Customer "Death" Using a Generalization of the Pareto/NBD Model," *Marketing Science*, 30 (5), 866–880.
- Massy, William F, David B. Montgomery and Donald G. Morrison (1970), *Stochastic models of buying behavior.* Cambridge, MA: The M.I.T. Press.

Covariates / Promotion

- Schweidel, D. A. and G. Knox (2013), "Incorporating Direct Marketing Activity into Latent Attrition Models," *Marketing Science*, 32 (3), 471–487.

Week 11: Models of Survey response

(Non-) response Bias

- **Otter, Thomas; Allenby, Greg M.; van Zandt, Trish (2008): An Integrated Model of Discrete Choice and Response Time. In *Journal of Marketing Research* 45 (5), pp. 593–607.
- ***Jong, M. G. de, D. R. Lehmann and O. Netzer (2012), "State-Dependence Effects in Surveys," *Marketing Science*, 31 (5), 838–854.**
- ***Büschken, J.; Otter, T.; Allenby, G. M. (2013): The Dimensionality of Customer Satisfaction Survey Responses and Implications for Driver Analysis. In *Marketing Science*.**
- van Rosmalen, Joost, Hester van Herk and Groenen, Patrick J. F (2010), "Identifying Response Styles: A Latent-Class Bilinear Multinomial Logit Model," *Journal of Marketing Research*, 47 (1), 157–172.
- Paulhus, Delroy L. (1991), "Measurement and control of response bias," in *Measures of personality and social psychological attitudes*. *Measures of social psychological attitudes, Vol. 1*, J. P. Robinson, P. R. Shaver and L. S. Wrightsman, eds. San Diego, CA, US: Academic Press, 17–59.
- Johnson, Timothy R. (2003), "On the use of heterogeneous thresholds ordinal regression models to account for individual differences in response style," *Psychometrika*, 68 (4), 563–583.
- Moe, Wendy W. and David A. Schweidel (2012), "Online Product Opinions. Incidence, Evaluation, and Evolution," *Marketing Science*, 31 (3), 372–386.

Scaling, Scale Heterogeneity and Ordinal Data

- **Rossi, Peter E, Zvi Gilula and Greg M. Allenby (2001), "Overcoming Scale Usage Heterogeneity: A Bayesian Hierarchical Approach," *Journal of the American Statistical Association*, 96 (453), 20-31.
- **Johnson, Timothy R. (2003), "On the use of heterogeneous thresholds ordinal regression models to account for individual differences in response style," *Psychometrika*, 68(4), 563-583.
- Bacon, Lynd, and Peter Lenk (2012), "Augmenting discrete-choice data to identify common preference scales for inter-subject analyses. " *Quantitative Marketing and Economics* 10 (4), 453-474.
- Review of Classical and Bayesian Inference, Chapters 1&2 from *Ordinal Data Modeling*, by Johnson and Albert, Springer-Verlag, 1999.
- Böckenholt, Ulf (2004), "Comparative Judgments as an Alternative to Ratings: Identifying the Scale Origin," *Psychological Methods*, 9 (4), 453–465.
- Bradlow, Eric T. and Alan M. Zaslavsky (1999), "A Hierarchical Latent Variable Model for Ordinal Data from a Customer Satisfaction Survey with 'No Answer' Responses," *Journal of the American Statistical Association*.
- Ying, Yuanping, Fred Feinberg and Michel Wedel (2006), "Leveraging Missing Ratings to Improve Online Recommendation Systems," *Journal of Marketing Research*, 43 (3), 355–365.

Cognitive Aspects of Survey Methodology (CASM)

- Schwarz, Norbert (2007): Cognitive aspects of survey methodology. In *Appl. Cognit. Psychol.* 21 (2), pp. 277–287.
- Tourangeau, Roger, Lance J. Rips and Kenneth A. Rasinski (2000), *The psychology of survey response.* Cambridge, U.K, New York: Cambridge University Press.

Week 12: Product Design, Conjoint Applications, Direct Utility Framework

Bayesian Choice Models

- ***Kim, Dong Soo, Bailey, Roger A., Hardt, Nino and Greg M. Allenby (2017) Benefit-Based Conjoint Analysis. *Marketing Science* 36(1), pp. 54-69**
- Satomura, Takuya, Jaehwan Kim and Greg M. Allenby (2011) "Multiple Constraint Choice Models with Corner and Interior Solutions," *Marketing Science*, 30, 3, 481-490.
- ***Gilbride, Timothy J. and Greg M. Allenby (2004), "A Choice Model with Conjunctive, Disjunctive, and Compensatory Screening Rules," *Marketing Science*, 23, 3 (Summer), 391-406.**
- Gilbride, Timothy J. and Greg M. Allenby (2006), "Estimating Heterogeneous EBA and Economic Screening Rule Choice Models," *Marketing Science*, 25, September-October, 494-509.
- Allenby, Greg, and Peter E. Rossi (2003), Bayesian Statistics and Marketing, *Marketing Science*, 304-328.
- Review of Classical and Bayesian Inference, Chapters 1&2 from *Ordinal Data Modeling*, by Johnson and Albert, Springer-Verlag, 1999.

Conjoint Practice and Select Issues

- **Agarwal, James, Wayne S. DeSarbo, Naresh K. Malhotra and Vithala R. Rao (2015), "An Interdisciplinary Review of Research in Conjoint Analysis. Recent Developments and Directions for Future Research," *Customer Needs and Solutions*, 2 (1), 19–40.
- **Netzer, Oded, Olivier Toubia, Eric T. Bradlow, Ely Dahan, Theodoros Evgeniou, Fred M. Feinberg, Eleanor M. Feit, Sam K. Hui, Joseph Johnson, John C. Liechty, James B. Orlin and Vithala R. Rao (2008), "Beyond conjoint analysis: Advances in preference measurement," *Marketing Letters*, 19 (3-4), 337–354.
- Aribarg, Anocha; Otter, Thomas; Zantedeschi, Daniel; Allenby, Greg M.; Bentley, Taylor; Curry, David J. et al. (2017): Advancing Non-compensatory Choice Models in Marketing. In *Customer Needs and Solutions*
- Dube, Jean-Pierre; Chintagunta, Pradeep; Petrin, Amil; Bronnenberg, Bart; Goettler, Ron; Seetharaman, P. B. et al. (2002): Structural Applications of the Discrete Choice Model. In Marketing Letters 13 (3), pp. 207–220.
- Bradlow, Eric T. (2005), "Current issues and a 'wish list' for conjoint analysis," *Applied Stochastic Models in Business and Industry*, 21 (4-5), 319–323.
- Sonnier, Garrett, Andrew Ainslie and Thomas Otter (2007), "Heterogeneity distributions of willingness-to-pay in choice models," *Quantitative Marketing and Economics*, 5 (3), 313–331.

Classical Choice Models

- Kamakura and Russell (1989), "A Probabilistic Choice Model for Market Segmentation and Elasticity Structure," *Journal of Marketing Research*, 26 (November), 379-90. 4
- Gudagni, P.M. and J.D.C. Little (1983), "A Logit Model of Brand Choice Calibrated on Scanner Data," *Marketing Science*, 2 (Summer), 203-238.
- Chapter 2-5, Train, Kenneth (2003), Discrete Choice Methods with Simulation, Cambridge University Press.
- Green, Paul E. and V. Srinivasan (1978), "Conjoint Analysis in Consumer Research: Issues and Outlook," Journal of Consumer Research, 5 (2), 103–123.

Week 13: Individual vs aggregate models of Demand

Aggregate Choice Models

- **Bodapati, Anand V., and Sachin Gupta (2004), "The Recoverability of Segmentation Structure from Store-level Aggregate Data," forthcoming, *Journal of Marketing Research*, 41 (3), 351-364.
- Christen, Markus, Sachin Gupta, John C. Porter, Richard Staelin and Dick R. Wittink (1997), "Using Market-Level Data to Understand Promotion Effects in a Nonlinear Model," *Journal of Marketing Research*, 34 (3), 322–334.

Aggregation Bias

- ***Allenby, Greg M. and Peter E. Rossi (1991), "There Is No Aggregation Bias: Why Macro Logit Models Work," *Journal of Business & Economic Statistics*, 9 (1), 1–14.**
- Tenn, Steven (2006), "Avoiding aggregation bias in demand estimation: A multivariate promotional disaggregation approach," *Quantitative Marketing and Economics*, 4 (4), 383–405.

Individual/Economic models

- ***Chen, Yuxin and Sha Yang (2007), "Estimating Disaggregate Models Using Aggregate Data Through Augmentation of Individual Choice," *Journal of Marketing Research*, 44 (4), 613–621.**
- Gupta, Sachin, Pradeep Chintagunta, Anil Kaul and Dick R. Wittink (1996), "Do Household Scanner Data Provide Representative Inferences from Brand Choices: A Comparison with Store Data," *Journal of Marketing Research*, 33 (4), 383–398.
- Mela, C. F. (2011), "Structural Workshop Paper--Data Selection and Procurement," *Marketing Science*, 30 (6), 965–976.
- Jiang, Renna, Puneet Manchanda and Peter E. Rossi (2009), "Bayesian analysis of random coefficient logit models using aggregate data," *Journal of Econometrics*, 149 (2), 136–148.
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Week 14: 'Big Data' and emerging trends

Unstructured Data

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Social Media and Networks

- ***Toubia, Olivier; Stephen, Andrew T. (2013): Intrinsic vs. Image-Related Utility in Social Media: Why Do People Contribute Content to Twitter? In *Marketing Science* 32 (3), 368–392.**
- Ascarza, Eva; Ebbes, Peter; Netzer, Oded; Danielson, Matthew (2017): Beyond the Target Customer: Social Effects of Customer Relationship Management Campaigns. In *Journal of Marketing Research* 54 (3), 347–363.
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- Yang, Liu; Toubia, Olivier; Jong, Martijn G. de (2015): A Bounded Rationality Model of Information Search and Choice in Preference Measurement. In *Journal of Marketing Research* 52 (2), 166–183.

Browsing data

- Bronnenberg, Bart J.; Kim, Jun B.; Mela, Carl F. (2016): Zooming In on Choice: How Do Consumers Search for Cameras Online? In *Marketing Science* 35 (5), 693–712.

Appendix: A Suggested Guide for "Reading" Journal Articles, by Vithala Rao, Cornell

Allow enough time to read the article at least twice. In the first reading, which may be quite superficial, try to get a general idea of the subject matter examined, uniqueness of the approach, and significant results. In the second reading, try to be critical of the concepts, assumptions, models, and application. If necessary, look over the article for a third time to seek a sharper understanding of the article and to evaluate where else the results and models can be applied.

While reading the article try and answer the questions indicated below for yourself. Doing so should significantly enhance your understanding of the research reported and your ability to critique the work.

Note that some published articles may not fit this format.

A. What aspect(s) of the business system is (are) being studied by the author? (E.g., relationship between a firm and competitor, consumer choices over time.)
B. What are some significant research issues addressed in the paper? Reflect upon why they are significant.
C. What specific managerial decisions can be addressed by the results reported in the paper? Are these decisions made better when the recommendations from this research are adopted?
. D1. What is (are) the microunit(s) whose "behavior" is (are) being addressed in the paper?
. D2. State the basic model of the behavior of the microunit in words or as a flow chart. State the premises and assumptions of the model. Identify major constructs.
. D3. State the basic model of the behavior of the microunit in a mathematical form and identify the variables (predictor or criterion) and the parameters (unknown) of the model.
E. Does the paper deal with aggregation of the model across various microunits or segments? If so, how is this aggregation accomplished? If aggregation is not considered, what are the effects of the assumption of homogeneity?
F. How are the variables of the model measured? Are these measures appropriate? What are the sources of data? How reliable are these measures? What are some alternative ways of measuring the variables?
G. How are the parameters of the model estimated? Are the properties of the estimates discussed? (For example, are they unbiased and/or consistent?)
H. Is the empirical application discussed in the papers appropriate? Are the results validated? (This aspect may not be relevant for some articles.)
I. Are the results interpreted well? Are there any alternative explanations of the results?
J. Identify one or two other applications of the basic model?
K. What general conclusions can be drawn? In what ways does this article contribute to (or extend) our understanding of marketing science in the substantive area(s) examined by the article?