

Syllabus:

Cemmap (Center for Microdata Methods and Practice) Master Class on “Structural Nonequilibrium Models of Strategic Thinking: Theory, Measurement, and Applications”
University College London **5-6 March 2009**

Economics 201C Segment on “Behavioral Game Theory: Strategic Thinking”
University of California, San Diego **30 March-27 April 2009**

Mini-Course on “Limited Cognition, Strategic Thinking, and Learning in Games”
University of Bonn, Graduate School of Economics Summer School **20-24 July 2009**

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Introduction

Behavioral game theory combines theory and empirical (mainly experimental) evidence to develop the understanding of strategic behavior needed to analyze economic, political, and social interactions. This understanding includes issues in behavioral decision theory such as present-biased or reference-dependent preferences and biases in probabilistic judgment, plus some issues that arise only in multi-person settings such as altruism, envy, reciprocity, and spite. It also includes purely strategic issues such as strategic thinking as revealed by people's initial responses to games, the structure of learning rules, and how the two interact to determine the dynamics and limiting outcomes of their interactions.

The master class/segment/mini-course will narrow the focus to strategic thinking, taking behavior as (mostly) self-interested and rational. Although strategic thinking has important influences on how people learn (via the structure of learning rules and how people extrapolate from experience with imperfectly analogous games), it appears in its purest form in initial responses to games played without clear precedents. It will be seen that experimental subjects' initial responses to games often deviate systematically from equilibrium, but that there are common elements in their deviations that allow certain kinds of structural non-equilibrium models to consistently out-predict equilibrium models.

Topics include the design of laboratory experiments to study strategic thinking, the use of econometric and other methods to analyze decision and process data, the leading models that have been proposed to describe strategic thinking, the lessons that can be drawn from experiments on initial responses to games, and the use of the resulting models to resolve theoretical and empirical puzzles in applications that have resisted analysis via equilibrium, quantal response equilibrium, and related methods.

Outline of Lectures

- 1. Introduction: Why Study Strategic Thinking?**
- 2. Nine “Folk Game Theory” Quotations (Keynes’s Beauty Contest, Graham’s Mr. Market, Kahneman’s Entry Magic, Lake Wobegon, Huarongdao, October Surprise, Bank Runs, Poe’s Outguessing Game)**
- 3. Leading Models of Strategic Thinking (Equilibrium Plus Noise, Finitely Iterated (Strict) Dominance and k -Rationalizability, Quantal Response Equilibrium (“QRE”) and Logit QRE (“LQRE”), Level- k Models, Cognitive Hierarchy Models, Noisy Introspection (“NI”) Models)**
- 4. Experimental Evidence (Nagel’s Design and Results, Costa-Gomes and Crawford’s Design and Results and Data Analysis)**
- 5. Lessons from the Experiments for Modeling Strategic Behavior (Level- k versus CH Models, Level- k versus Equilibrium Plus Noise or LQRE Models, Level- k versus NI Models, Observations about the Models’ Cognitive Requirements)**
- 6. Illustration of Level- k Analyses of Matrix Games with Unique Mixed-Strategy Equilibria: M. M. Kaye’s *The Far Pavilions***
- 7. Kahneman’s Entry Magic: Asymmetric Coordination via Structure in Entry Games**
- 8. Bank Runs: Symmetric Coordination via Structure**
- 9. Structural Alternatives to “Incomplete” Models**
- 10. Yuschenko and Lake Wobegon: Framing Effects in Zero-Sum Two-Person Games (Evaluating the Model’s Explanation: Overfitting and Portability)**
- 11. Chicago Skyscrapers: Framing Effects and Miscoordination in Schelling-Style Coordination Games**
- 12. Huarangdao and D-day: Preplay Communication of Intentions in Zero-Sum Two-Person Games with Possibly Sophisticated Players**
- 13. Preplay Communication of Intentions in Coordination Games**
- 14. October Surprise: Preplay Communication of Private Information in Zero-Sum Two-Person Games**
- 15. Overbidding in Independent-Private-Value and Common-Value Auctions**
- 16. Behaviorally Optimal Auction Design**

Readings (the readings don't strictly follow the same order as the lectures, and I have listed many, many more topics and readings than we can possibly cover; the most important readings are marked *)

A. Theory and Evidence

A1. Overview of Behavioral Game Theory and Game Experiments

*(henceforth "CC") Colin Camerer, *Behavioral Game Theory: Experiments on Strategic Interaction*, Princeton, 2003: Chapter 1, "Introduction"; Appendix 1.1, "Basic Game Theory"; and Appendix 1.2, "Experimental Design"

*(henceforth "VC") Vincent Crawford, "Theory and Experiment in the Analysis of Strategic Interaction," Chapter 7 in David Kreps and Ken Wallis (eds.), *Advances in Economics and Econometrics: Theory and Applications, Seventh World Congress*, Vol. I, Cambridge 1997; reprinted with minor changes in Colin Camerer, George Loewenstein, and Matthew Rabin, editors, *Readings in Behavioral Economics*, Princeton and Russell Sage Foundation, February 2004: Sections 1, "Introduction"; 2, "Theoretical Frameworks and Unresolved Questions"; 3, "Experimental Designs"; and 7, "Conclusion"; (in manuscript form)

<http://dss.ucsd.edu/~vcrawfor/ShortTh&Exp.pdf>

Colin Camerer, "Progress in Behavioral Game Theory," *Journal of Economic Perspectives* 11 (1997), 167-188; <http://www.jstor.org/stable/2138470>

Reinhard Selten, "Features of Experimentally Observed Bounded Rationality," *European Economic Review* 42 (1998), 413-436; [doi:10.1016/S0014-2921\(97\)00148-7](https://doi.org/10.1016/S0014-2921(97)00148-7)

Vincent Crawford, "Introduction to Experimental Game Theory," *Journal of Economic Theory* 104 (2002), 1-15: Section 1, "Introduction"; [doi:10.1006/jeth.2001.2909](https://doi.org/10.1006/jeth.2001.2909)

Thomas Schelling, *The Strategy of Conflict*, Oxford 1960 or Harvard 1980

David Kreps, *Game Theory and Economic Modelling*, Oxford 1990

A2. Alternative Models of Initial Responses to Games

*CC, Appendix 1.1, "Basic Game Theory"

*Miguel Costa-Gomes, Vincent Crawford, and Nagore Iriberry, "Comparing Models of Strategic Thinking in Van Huyck, Battalio, and Beil's Coordination Games," *Journal of the European Economic Association* 7 (April-May 2009), in press: Sections 1, "Introduction"; and 2, "Alternative Models of Initial Responses to Games"; <http://dss.ucsd.edu/~vcrawfor/CGCIJEEA17Oct08.pdf>

a. Equilibrium

*Adam Brandenburger, "Knowledge and Equilibrium in Games," *Journal of Economic Perspectives* 6 (1992), 83-101; <http://www.jstor.org/stable/2138270>

b. Equilibrium with extensive-form refinements: backward and forward induction

*Philip Reny, "Rationality In Extensive Form Games," *Journal of Economic Perspectives* 6 (1992), 103-118; <http://www.jstor.org/stable/2138271>

Robert Aumann, "Backward Induction and Common Knowledge of Rationality," *Games and Economic Behavior* 8 (1995), 6-19; [doi:10.1016/S0899-8256\(05\)80015-6](https://doi.org/10.1016/S0899-8256(05)80015-6)

Elchanen Ben-Porath and Eddie Dekel, "Signaling Future Actions and the Potential for Sacrifice," *Journal of Economic Theory* 57 (1992), 36-51; [doi:10.1016/S0022-0531\(05\)80039-0](https://doi.org/10.1016/S0022-0531(05)80039-0)

c. Equilibrium with coordination refinements: risk- and payoff-dominance

John Harsanyi and Reinhard Selten, *A General Theory of Equilibrium Selection in Games*, MIT 1988

d. Quantal response equilibrium

*Richard McKelvey and Thomas Palfrey, “Quantal Response Equilibria for Normal-Form Games,” *Games and Economic Behavior* 10 (1995), 6-38; [doi:10.1006/game.1995.1023](https://doi.org/10.1006/game.1995.1023)

Philip Haile, Ali Hortaçsu, and Grigory Kosenok, “On the Empirical Content of Quantal Response Equilibrium,” *American Economic Review* 98 (2008), 180-200; <http://www.aeaweb.org/articles.php?doi=10.1257/aer.98.1.180> or <http://www.econ.yale.edu/~pah29/qre.pdf>

Richard McKelvey and Thomas Palfrey, “Quantal Response Equilibria for Extensive-Form Games,” *Experimental Economics* 1 (1998), 9-41; [doi:10.1007/BF01426213](https://doi.org/10.1007/BF01426213)

e. Level- k models

*Miguel Costa-Gomes, Vincent Crawford, and Nagore Iriberri, “Comparing Models of Strategic Thinking in Van Huyck, Battalio, and Beil’s Coordination Games,” *Journal of the European Economic Association* 7 (2009), in press: 5-6 (in manuscript); <http://dss.ucsd.edu/~vcrawfor/CGCIJEEA17Oct08.pdf>

f. Cognitive hierarchy models

*Colin Camerer, Teck-Hua Ho, and Juin Kuan Chong, “A Cognitive Hierarchy Model of Games,” *Quarterly Journal of Economics* 119 (2004), 861-898: Sections I-III; <http://www.mitpressjournals.org/doi/abs/10.1162/0033553041502225> or <http://www.hss.caltech.edu/~camerer/qjefinal6.pdf>

g. Noisy introspection

Goeree, Jacob, and Charles Holt (2004), “A Model of Noisy Introspection,” *Games and Economic Behavior* 46, 365–382; [doi:10.1016/S0899-8256\(03\)00145-3](https://doi.org/10.1016/S0899-8256(03)00145-3)

A3. Experimental Evidence on Initial Responses to Games

a. Normal-form games

*CC, Chapters 5, “Dominance-Solvable Games”; and 7, “Coordination”

*VC, Chapters 4, “Dominance and Iterated Dominance”; and 5, “Simultaneous Coordination”

*Colin Camerer, Teck-Hua Ho, and Juin Kuan Chong, “A Cognitive Hierarchy Model of Games,” *Quarterly Journal of Economics* 119 (2004), 861-898: Section IV; <http://www.mitpressjournals.org/doi/abs/10.1162/0033553041502225> or <http://www.hss.caltech.edu/~camerer/qjefinal6.pdf>

*Miguel Costa-Gomes and Vincent Crawford, “Cognition and Behavior in Two-Person Guessing Games: An Experimental Study,” *American Economic Review* 96 (2006), 1737-1768: Section II.D reviews the evidence, the rest reports new evidence; [DOI:10.1257/aer.96.5.1737](https://doi.org/10.1257/aer.96.5.1737) or <http://dss.ucsd.edu/~vcrawfor/CGCAER06.pdf>; instructions, data, and slides at <http://dss.ucsd.edu/~vcrawfor/#Guess>

Dale Stahl and Paul Wilson, “On Players’ Models of Other Players: Theory and Experimental Evidence,” *Games and Economic Behavior* 10 (1995), 218-254; [doi:10.1006/game.1995.1031](https://doi.org/10.1006/game.1995.1031)

Rosemarie Nagel, “Unraveling in Guessing Games: An Experimental Study,” *American Economic Review* 85 (1995), 1313-1326; <http://www.jstor.org/stable/2950991>

Teck-Hua Ho, Colin Camerer, and Keith Weigelt, “Iterated Dominance and Iterated Best Response in Experimental ‘ p -Beauty Contests’,” *American Economic Review*, 88 (1998), 947-969; <http://www.jstor.org/stable/117013>

Miguel Costa-Gomes, Vincent Crawford, and Bruno Broseta, “Cognition and Behavior in Normal-Form Games: an Experimental Study,” *Econometrica* 69 (2001), 1193-1235; <http://www.jstor.org/stable/2692219> or <http://dss.ucsd.edu/~vcrawfor/CGCrBr01EMT.pdf>.

Georg Weizsäcker, "Ignoring the Rationality of Others: Evidence from Experimental Normal-Form Games," *Games and Economic Behavior* 44 (2003), 145-171; [doi:10.1016/S0899-8256\(03\)00017-4](https://doi.org/10.1016/S0899-8256(03)00017-4)

Miguel Costa-Gomes and Georg Weizsäcker, "Stated Beliefs and Play in Normal-Form Games," *Review of Economic Studies*, 75 (2008), 729-762; <http://www3.interscience.wiley.com/cgi-bin/fulltext/120084319/PDFSTART> or (in manuscript) http://personal.lse.ac.uk/weizsack/Costa-Gomes_Weizsacker-27-04-06.pdf.

Vincent Crawford, "Look-ups as the Windows of the Strategic Soul: Studying Cognition via Information Search in Game Experiments," in Andrew Caplin and Andrew Schotter, editors, *Perspectives on the Future of Economics: Positive and Normative Foundations*, Volume 1, Handbooks of Economic Methodologies, Oxford University Press, 2008; (in manuscript) <http://dss.ucsd.edu/~vcrawfor/12Jan07NYUCognitionSearchMain.pdf>

b. Extensive-form games

*CC, Chapters 4.2, "Structured Bargaining"; 4.3, "Bargaining with Incomplete Information"; 4.4, "Conclusion": and 7.2, "Asymmetric Players: Battle of the Sexes"

*VC, Sections 4.2, "Ultimatum and alternating-offers bargaining"; and 5.1, "Signaling games"

T. Randolph Beard and Richard Beil, "Do People Rely on the Self-interested Maximization of Others? An Experimental Test," *Management Science* 40 (1994), 252-262; <http://www.jstor.org/stable/2632764>

Richard McKelvey and Thomas Palfrey, "An Experimental Study of the Centipede Game," *Econometrica* 60 (1992), 803-836; <http://www.jstor.org/stable/2951567>

Toshiji Kawagoe and Hirokazu Takizawa, "Level-k Analysis of Experimental Centipede Games," 2008; http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1289514

David Cooper and John Van Huyck, "Evidence on the Equivalence of the Strategic and Extensive Form Representation of Games," *Journal of Economic Theory* 110 (2003), 290-308; [doi:10.1016/S0022-0531\(03\)00040-1](https://doi.org/10.1016/S0022-0531(03)00040-1)

Vincent Crawford, "Introduction to Experimental Game Theory," *Journal of Economic Theory* 104 (2002), 1-15: Section 2, "Backward Induction, Social Preferences, Implementation, and Preplay Communication in Extensive-Form Games" introduces next two papers; [doi:10.1006/jeth.2001.2909](https://doi.org/10.1006/jeth.2001.2909)

Eric Johnson, Colin Camerer, Sankar Sen, and Talia Rymon, "Detecting Failures of Backward Induction: Monitoring Information Search in Sequential Bargaining," *Journal of Economic Theory* 104 (2002), 16-47; [doi:10.1006/jeth.2001.2850](https://doi.org/10.1006/jeth.2001.2850)

Ken Binmore, John McCarthy, Giovanni Ponti, Larry Samuelson, and Avner Shaked, "A Backward Induction Experiment," *Journal of Economic Theory* 104 (2002), 48-88; [doi:10.1006/jeth.2001.2910](https://doi.org/10.1006/jeth.2001.2910)

Teck-Hua Ho and Keith Weigelt, "Task Complexity, Equilibrium Selection, and Learning: An Experimental Study," *Management Science* 42 (1996), 659-679; <http://www.jstor.org/stable/2634458>

Colin Camerer and Eric Johnson, "Thinking About Attention in Games: Backward and Forward Induction," in Isabel Brocas and Juan Carrillo (editors), *The Psychology of Economic Decisions, Volume Two: Reasons and Choices*, Oxford, 2004; linked in manuscript at (<http://www.hss.caltech.edu/~camerer/ericchap5.pdf>)

Vincent Crawford, "A Survey of Experiments on Communication via Cheap Talk," *Journal of Economic Theory* 78 (1998), 286-298; [doi:10.1006/jeth.1997.2359](https://doi.org/10.1006/jeth.1997.2359)

Russell Cooper, Douglas DeJong, Robert Forsythe, and Thomas Ross, "Alternative Institutions for Resolving Coordination Problems: Experimental Evidence on Forward Induction and Preplay Communication," 129-146 in James Friedman (ed.), *Problems of Coordination in Economic Activity*, Boston: Kluwer, 1994

c. Unstructured bargaining games

*CC, Chapter 4.1, "Unstructured Bargaining"

*VC, Chapter 5.3, "Unstructured Bargaining"

Alvin Roth, "Bargaining Phenomena and Bargaining Theory," Chapter 2 in Roth (ed.), *Laboratory Experimentation in Economics: Six Points of View*, Cambridge, 1987

Alvin Roth, "Toward a Focal-Point Theory of Bargaining," Chapter 12 in Roth, (ed.), *Game-Theoretic Models of Bargaining*, Cambridge, 1985

B. Applications

B1. Coordination via Symmetry-Breaking in Market-Entry and Battle of the Sexes Games

*Colin Camerer, Teck-Hua Ho, and Juin Kuan Chong, "A Cognitive Hierarchy Model of Games," *Quarterly Journal of Economics*, 119 (2004), 861-898: Section III.C, "Market Entry Games"; <http://www.mitpressjournals.org/doi/abs/10.1162/0033553041502225> or (in manuscript form) <http://www.hss.caltech.edu/~camerer/qjefinal6.pdf>

Kahneman, Daniel, "Experimental Economics: A Psychological Perspective," in R. Tietz, W. Albers, and R. Selten, editors, *Bounded Rational Behavior in Experimental Games and Markets*. New York: Springer-Verlag, 1988: 11-18.

Rapoport, Amnon, and Darryl A. Seale, "Coordination Success in Noncooperative Large Group Market Entry Games." In Rami Zwick and Amnon Rapoport, editors, *Experimental Business Research*. Dordrecht, The Netherlands: Kluwer Academic, 2002.

*Vincent Crawford, "Let's Talk It Over: Coordination via Preplay Communication with Level-*k* Thinking," manuscript of paper presented as Keynote address, Arne Ryde Symposium on Communication in Games and Experiments, Lund University, August 2007: Section I, "A Level-*k* Model of Tacit Coordination"; <http://dss.ucsd.edu/~vcrawfor/LetsTalk13Aug07.pdf>

Roger Myerson, "Ware Medical Corporation," case linked at (<http://www.kellogg.northwestern.edu/faculty/weber/DECS-452/index.htm>)

Timothy Bresnahan and Peter Reiss, "Econometric Models of Discrete Games," *Journal of Econometrics*, 48 (1991), 57-81; [doi:10.1016/0304-4076\(91\)90032-9](https://doi.org/10.1016/0304-4076(91)90032-9)

Avi Goldfarb and Botao Yang, "Are All Managers Created Equal?," *Journal of Marketing Research* XLVI (2009), in press; <http://www.marketingpower.com/ResourceLibrary/Documents/JMRForthcoming/Are%20All%20Managers.pdf>

Andres Aradillas-Lopez and Elie Tamer, "The Identification Power of Equilibrium in Simple Games," *Journal of Business & Economic Statistics* 26 (2008), 261-283; <http://dx.doi.org/10.1198/073500108000000105>

B2. Outguessing in Zero-Sum Games with Non-neutrally Framed Locations

*Vincent Crawford and Nagore Iriberry, "Fatal Attraction: Saliency, Naivete, and Sophistication in Experimental Hide-and-Seek Games," *American Economic Review* 97 (2007), 1731-1750; <http://dss.ucsd.edu/~vcrawfor/#Hide> or <http://www.e-jel.org/atypon/connect.php?doi=10.1257/aer.97.5.1731&journal=AER&mode=member>

Robert Östling, Joseph Tao-Yi Wang, Eileen Chou, and Colin Camerer, "Strategic Thinking and Learning in the Field and the Lab: Evidence from Poisson LUPU Lottery Games," 2008;

<http://swopec.hhs.se/hastef/papers/hastef0671.pdf> or
http://www.hss.caltech.edu/~camerer/web_material/Limbo17.pdf

Chivers, C. J., “A Dinner in Ukraine Made for Agatha Christie,” *The New York Times*, December 20, 2004, A1.

Attali, Yigal, and Maya Bar-Hillel, “Guess Where: The Position of Correct Answers in Multiple-Choice Test Items as a Psychometric Variable,” *Journal of Educational Measurement*, 40 (2003), 109-128.

Keillor, Garrison, *Wobegon Boy*. New York: Penguin, 1997.

B3. Coordination via Structure and Framing in Bargaining and Coordination Games

Thomas Schelling, *The Strategy of Conflict*, Oxford 1960 or Harvard 1980: Chapter 3, “Bargaining, Communication, and Limited War”, and Appendix C

Judith Mehta, Chris Starmer, and Robert Sugden, “The Nature of Salience: An Experimental Investigation of Pure Coordination Games,” *American Economic Review* 84 (1994), 658-674; <http://www.jstor.org/stable/2118074>

Vincent Crawford, Uri Gneezy, and Yuval Rottenstreich, “The Power of Focal Points is Limited: Even Minute Payoff Asymmetry May Yield Large Coordination Failures,” *American Economic Review* 98 (2008), 1443–1458;

<http://www.aeaweb.org/articles.php?doi=10.1257/aer.98.4.1443> or
<http://dss.ucsd.edu/~vcrawfor/CrawfordGneezyRottenstreichAER08.pdf>

B4. Coordination via Structure in Symmetric Coordination Games with Pareto-ranked Equilibria

*VC, Chapter 6.3, “Simultaneous coordination revisited”

Vincent Crawford, “Adaptive Dynamics in Coordination Games,” *Econometrica* 63 (1995), 103-143: Section 2 (pp. 106-109, especially footnote 8); <http://www.jstor.org/stable/2951699> or
<http://dss.ucsd.edu/~vcrawfor/Crawford95EMT.pdf>)

*Miguel Costa-Gomes, Vincent Crawford, and Nagore Iriberry, “Comparing Models of Strategic Thinking in Van Huyck, Battalio, and Beil’s Coordination Games,” *Journal of the European Economic Association* 7 (April-May 2009), in press: Section 3, “Van Huyck, Battalio, and Beil’s (1990, 1991) coordination games”; <http://dss.ucsd.edu/~vcrawfor/CGCIJEEA17Oct08.pdf>

Summers, Lawrence, “International Financial Crises: Causes, Prevention, and Cures,” *American Economic Review* 90 (2000), 1-16 (especially 7); <http://www.jstor.org/stable/117183>

Morris, Stephen, and Shin, Hyun Song, “Unique Equilibrium in a Model of Self-Fulfilling Currency Attacks,” *American Economic Review* 88 (1998), 587-97; <http://www.jstor.org/stable/116850>

Hans Carlsson and Mattias Ganslandt, “Noisy Equilibrium Selection in Coordination Games,” *Economics Letters* 60 (1998), 23–34; [doi:10.1016/S0165-1765\(98\)00076-7](https://doi.org/10.1016/S0165-1765(98)00076-7)

Komunjer, Ivana, and Federico Echenique, “Testing Models with Multiple Equilibria by Quantile Methods,” *Econometrica* (forthcoming)

B5. Money Illusion

- *Colin Camerer, Teck-Hua Ho, and Juin Kuan Chong, “A Cognitive Hierarchy Model of Games,” *Quarterly Journal of Economics* 119 (2004), 861-898: Section VI.B, “Money Illusion”; <http://www.mitpressjournals.org/doi/abs/10.1162/0033553041502225> or (in manuscript form) <http://www.hss.caltech.edu/~camerer/qjefinal6.pdf>
- Ernst Fehr and Jean-Robert Tyran, “Individual Irrationality and Aggregate Outcomes,” *Journal of Economic Perspectives* 19 (2005), 43–66; <http://www.jstor.org/stable/4134954>
- Ernst Fehr and Jean-Robert Tyran, “Money Illusion and Coordination Failure,” *Games and Economic Behavior* 58 (2007), 246-268; [doi:10.1016/j.geb.2006.04.005](https://doi.org/10.1016/j.geb.2006.04.005)
- Ernst Fehr and Jean-Robert Tyran, “Limited Rationality and Strategic Interaction. The Impact of the Strategic Environment on Nominal Inertia,” *Econometrica* 76 (2008), 353-394; <http://www.econometricsociety.org/includes/tps.asp?vid=76&iid=2&aid=836&type=353>

B6. Strategic Communication of Intentions

- *Joseph Farrell and Matthew Rabin, “Cheap Talk,” *Journal of Economic Perspectives* 10 (1996), 103-118; <http://www.jstor.org/stable/2138522>
- Joseph Farrell, “Communication, Coordination and Nash Equilibrium,” *Economics Letters* 27 (1988), 209-214; [doi:10.1016/0165-1765\(88\)90172-3](https://doi.org/10.1016/0165-1765(88)90172-3)
- Joseph Farrell, “Cheap Talk, Coordination, and Entry,” *RAND Journal of Economics* 18 (1987), 34-39; <http://www.jstor.org/stable/2555533>
- Matthew Rabin, “A Model of Pre-game Communication,” *Journal of Economic Theory* 63 (1994), 370-391; [doi:10.1006/jeth.1994.1047](https://doi.org/10.1006/jeth.1994.1047)
- *Vincent Crawford, “Lying for Strategic Advantage: Rational and Boundedly Rational Misrepresentation of Intentions,” *American Economic Review* 93 (2003), 133-149; <http://www.jstor.org/stable/3132165> or (in manuscript form) <http://weber.ucsd.edu/~vcrawfor/LyingFinal.pdf>
- Tore Ellingsen and Robert Östling, “Communication and Coordination: The Case of Boundedly Rational Players,” 2007; <http://www2.hhs.se/personal/Ellingsen/pdf/BRC271107b.pdf>
- Vincent Crawford, “Let’s Talk It Over: Coordination via Preplay Communication with Level-*k* Thinking,” manuscript presented at Arne Ryde Symposium on Communication in Games and Experiments, August 2007; <http://dss.ucsd.edu/~vcrawfor/#Talk>

B7. Strategic Communication of Private Information

- *Joseph Farrell and Matthew Rabin, “Cheap Talk,” *Journal of Economic Perspectives* 10 (1996), 103-118; <http://www.jstor.org/stable/2138522>
- Vincent Crawford and Joel Sobel, “Strategic Information Transmission,” *Econometrica* 50 (1982), 1431-1451; <http://www.jstor.org/stable/1913390>
- Joseph Farrell, “Meaning and Credibility in Cheap-Talk Games,” *Games and Economic Behavior* 5 (1993), 514-531; [doi:10.1006/game.1993.1029](https://doi.org/10.1006/game.1993.1029)
- Kartik, Navin, Marco Ottaviani, and Francesco Squintani, “Credulity, lies, and costly talk,” *Journal of Economic Theory* 134 (2007), 93-116; [doi:10.1016/j.jet.2006.04.003](https://doi.org/10.1016/j.jet.2006.04.003)
- Hongbin Cai and Joseph Wang, “Overcommunication in Strategic Information Transmission Games,” *Games and Economic Behavior* 56 (2006), 7–36; [doi:10.1016/j.geb.2005.04.001](https://doi.org/10.1016/j.geb.2005.04.001)
- Joseph Wang, Michael Spezio, and Colin Camerer, “Pinocchio’s Pupil: Using Eyetracking and Pupil Dilation To Understand Truth-telling and Deception in Games,” 2006; <http://www.hss.caltech.edu/~camerer/pinocchio2.pdf>
- Toshiji Kawagoe and Hirokazu Takizawa, “Equilibrium Refinement vs. Level-*k* Analysis: An Experimental Study of Cheap-Talk Games with Private Information,” *Games and Economic Behavior* (2008), in press; [doi:10.1016/j.geb.2008.04.008](https://doi.org/10.1016/j.geb.2008.04.008)

Rany Jazayerli, "Guest Column: Will Bin Laden Strike Again?," October 10, 2008; <http://www.fivethirtyeight.com/2008/10/guest-column-will-bin-laden-strike.html>

Ulrike Malmendier and Devin Shanthikumar, "Are Small Investors Naive about Incentives?," *Journal of Financial Economics* 85 (2007), 457-489; [doi:10.1016/j.jfineco.2007.02.001](https://doi.org/10.1016/j.jfineco.2007.02.001)

Ron Suskind, *The One Percent Doctrine*, New York: Simon and Schuster, 2006.

Rany Jazayerli, "Guest Column: Will Bin Laden Strike Again?," October 10, 2008; <http://www.fivethirtyeight.com/2008/10/guest-column-will-bin-laden-strike.html>

B8. Auctions

Jacob Goeree, Charles Holt, and Thomas Palfrey, "Quantal Response Equilibrium and Overbidding in Private-Value Auctions," *Journal of Economic Theory*, 104 (2002), 247-272; [doi:10.1006/jeth.2001.2914](https://doi.org/10.1006/jeth.2001.2914)

Erik Eyster and Matthew Rabin, "Cursed Equilibrium," *Econometrica*, 73 (2005), 1623-1672; <http://www.econometricsociety.org/includes/tps.asp?vid=73&iid=5&aid=631&type=1623>

*Vincent Crawford and Nagore Iriberrri, "Level-k Auctions: Can Boundedly Rational Strategic Thinking Explain the Winner's Curse and Overbidding in Private-Value Auctions?," *Econometrica* 75 (2007), 1721-1770; <http://dss.ucsd.edu/~vcrawfor/#Auctions>

Vincent Crawford, Tamar Kugler, Zvika Neeman, and Ady Pauzner, "Behaviorally Optimal Auction Design: An Example and Some Observations," *Journal of the European Economic Association* 7 (April-May 2009), in press; <http://dss.ucsd.edu/~vcrawfor/CKNPBehaviorallyOptimalAuctionsManuscript14Oct08.pdf>

Ulrike Malmendier and Adam Szeidl, "Fishing for Fools," manuscript, 2008; http://www.econ.berkeley.edu/~ulrike/Papers/fishing_for_fools.pdf

B9. Other Games of Incomplete Information

*Colin Camerer, Teck-Hua Ho, and Juin Kuan Chong, "A Cognitive Hierarchy Model of Games," *Quarterly Journal of Economics*, 119 (2004), 861-898: Section VI.A, "Speculation"; <http://www.mitpressjournals.org/doi/abs/10.1162/0033553041502225> or (in manuscript form) <http://www.hss.caltech.edu/~camerer/qjefinal6.pdf>

Jonathan Skinner, "Purification of a Mixed Strategy Equilibrium," *Journal of Political Economy* 116 (2008), back cover; [doi:10.1086/595969](https://doi.org/10.1086/595969)

Philippe Jehiel and Frédéric Koessler, "Revisiting Games of Incomplete Information with Analogy-Based Expectations," *Games and Economic Behavior* 62 (2008) 533-557; [doi:10.1016/j.geb.2007.06.006](https://doi.org/10.1016/j.geb.2007.06.006)

Gary Charness and Dan Levin, "The Origin of the Winner's Curse: A Laboratory Study," *American Economic Journal: Microeconomics*, 1 (2009), in press; <http://www.aeaweb.org/aej-micro/accepted/MIC-2007-0003.pdf> or (in manuscript form) http://papers.ssrn.com/sol3/papers.cfm?abstract_id=932250

Asen Ivanov, Dan Levin, and James Peck, "Hindsight, Foresight, and Insight: An Experimental Study of a Small-Market Investment Game with Common and Private Values," *American Economic Review* 99 (2009), in press; <http://www.e-aer.org/accepted/20070475.pdf>

Erik Eyster and Matthew Rabin, "Naive Herding," LSE and UC Berkeley, 2008; <http://else.econ.ucl.ac.uk/conferences/bbw08/talks/eyster.pdf>

Alexander Brown, Colin Camerer, and Dan Lovallo, "To Review or Not To Review? Limited Strategic Thinking at the Movie Box Office," 2008; <http://econweb.tamu.edu/abrown/cold.pdf>

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