

## **The Affliction of Choice: Sub-Optimality in Health Insurance Decisions**

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Economists have long sought to understand how individuals navigate important financial choices in the face of risk and uncertainty. While economists have historically characterized risky and uncertain choice with models of rational actors who maximize expected utility (e.g., Von Neumann and Morgenstern 1948; Savage 1948), recent laboratory evidence has documented significant sub-optimality and departures from the expected-utility framework due to psychological frictions such as the size and the complexity of the choice set (e.g., Iyengar and Lepper 2000).

In this project, we hope to make two significant contributions to this discourse. First, we intend to test for the existence of sub-optimality due to choice complexity in the specific domain of health insurance decisions. We will implement this test by leveraging access to a uniquely rich dataset of tens of thousands of employees at a major U.S. firm that varied its plan choice regimes over time. Critically, due to the manner in which plan options are priced at this firm, our analysis will permit us to identify choice sub-optimality without any assumptions of risk preferences or beliefs, but, instead, from the revealed choice of completely dominated plan options. We expect this analysis will add to the literature that has documented evidence for psychologically informed departures from the standard model in a range of important field settings (see DellaVigna 2009), as well as a more specific, and recent, literature that has hypothesized non-standard behavior in insurance markets (e.g., Sydnor 2010; Barseghyan, Molinari, O'Donoghue, and Teitelbaum 2012).

While we believe that evidence of non-standard choice (and the persistence of such choice) in the consequential setting of health insurance would alone be of theoretical and policy interest, our empirical setting permits us to make a second contribution. Specifically, we will illuminate the mechanisms underlying any observed sub-optimality by disentangling two mechanisms: Does sub-optimality arise because individuals are cognitively or psychologically overwhelmed by the expansiveness of the choice set, or is inefficiency induced at each juncture at which an individual is asked to make a choice along some attribute dimension (i.e., due to factors unrelated to the choice context)? This distinction has important theoretical implications for our understanding of behavior, as well as practical implications for the efficient design of choice environments particularly when the choice involves tradeoffs across attributes. Given the recent proliferation of available options in health insurance, as well as the anticipated

introduction of insurance “exchanges,” the potential role of psychological frictions, such as decision-choice complexity, looms as increasingly important.

Our desire to test the hypothesized influence of the choice set on choice efficiency in the insurance market is enabled by access to a very rich dataset of nearly 250,000 insurance choices made by the universe of benefit eligible employees of a large firm over a 4 year period. Specifically our data is from a firm that, twice in recent years, modified its menu of health insurance plans. The firm originally offered a 3 plan menu featuring a low, medium, and high deductible accompanied by a fixed bundle of non-deductible attributes. The firm then implemented a “build your own” choice regime in which employees were asked to actively select the desired level for each of 4 plan attributes and effectively choose among one of 48 plans. Finally the firm expanded the deductible menu and the effective choice set to 60 plans. In this environment, with data on the plan choices of existing and new hires over time, we can explicitly examine how the complexity of the plan menu influenced the optimality of resulting decisions.

All told we have individual micro-data on plan choice (including choice of 4 available plan attributes: deductible, copay, coinsurance, and out-of-pocket maximum), medical claims and visitation, descriptive characteristics such as gender, income, age, height, weight, marital status, medical history, as well as details of occupational type and firm tenure. Further, we have the ability to calculate counter-factual expenses for each plan option the individual did not choose. We believe that our dataset possesses features unique from those examined in prior research. In a series of laboratory experiments with simulated choice settings, we intend to verify our hypotheses regarding the effects of choice complexity, further elaborate upon specific mechanisms, and identify choice architectures that lead to greater efficiency.

Our findings will have implications for individual welfare and the optimal design of insurance programs. If the negative effects of choice abundance are borne out, we can consider the welfare implications associated with alternative, simpler, choice regimes. As an example, we can document the efficiency gains and distributional costs of replacing the conjoint 48 plan choice design offered by the firm in our dataset with the single modal optimal plan.

Finally, beyond demonstrating sub-optimality in insurance choice due to choice context, our data permits us to examine how sub-optimality, and sensitivity to choice complexity, varies across dimensions of theoretical and policy interest. Specifically, we intend to test whether the effects are moderated by firm tenure and plan, income, gender, age, and individual healthiness. A dimension of particular interest is individual income. If choice is particularly debilitating for those of low to moderate incomes, then this supports the recent claims in the literature that choice complexity may be a hidden and regressive feature of benefit program design (e.g., Zeckhauser 2008; Bertrand and Mullainathan 2008; Bhargava and Manoli 2012).

## SAURABH BHARGAVA

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### APPOINTMENTS

Assistant Professor of Economics, Department of Social and Decision Sciences, Carnegie Mellon (Current)  
Adjunct Assistant Professor, University of Chicago, Booth School of Business, 2008 to 2012  
Post-Doctoral Fellow, University of Chicago, Harris School of Public Policy (and NORC), 2010 to 2012

### EDUCATION

Ph.D., Economics, University of California, Berkeley, 2008  
M.A., Economics, University of California, Berkeley, 2005

#### PRE-GRADUATE:

A.B., Economics, Harvard University (magna cum laude), 2000  
Valedictorian, Jefferson Senior High School (USA Today - All-Academic First Team; Research Science Institute), 1996

### TEACHING EXPERIENCE

Faculty Instructor, Carnegie Mellon University, 2013  
Behavioral Economics in the Wild  
Empirical Research Methods in the Social Sciences (Econometrics)  
Faculty Instructor, University of Chicago, Booth School of Business, 2009, 2010, 2012  
Strategies and Processes of Negotiation  
Graduate Student Instructor, U.C. Berkeley, 2004 to 2008  
Econometrics, Macroeconomics, Introductory Economics [Department of Economics]  
International Business Strategy [Haas School of Business]

### PROFESSIONAL AND RESEARCH EXPERIENCE

#### CORPORATE:

Business Analyst, McKinsey & Company, Chicago, Illinois, 2000 to 2002  
The Weather Channel, Pittsburgh, PA, 2013 [Consulting]  
Department of Justice, Anti-Trust Division, Washington, DC, 2010 [Consulting]  
Discover Corporation, Chicago, Illinois, 2010 [Consulting]

#### RESEARCH:

Research Assistant, U.C. Berkeley, Department of Economics, 2002 to 2004 (for Stefano DellaVigna)  
Research Assistant, Harvard Business School, 1997 to 1999 (for Josh Lerner)

### MEDIA

**Driving Under the (Cellular) Influence:** Marginal Revolution (Blog), The New York Times (Technology Blog), Freakonomics (Blog), Bloomberg, CBS Radio (SF Affiliate), Fox TV (SF Affiliate), San Francisco Examiner, NPR – Michael Krasny Show (KQED), CBS Radio (St. Louis Affiliate), Chicago Tribune

**Invited Columns:** “Dismal Science No More?” The Financial Express (India), 6/09 [A column discussing the policy implications of psychological and economic research on hedonics and subjective well-being], “An Immodest Truth,” The Financial Express (India), 9/09 [A column discussing the role of overconfidence in shaping everyday decisions as well as broader financial and political outcomes]

## **PUBLISHED AND COMPLETED PAPERS**

1. **Driving Under the (Cellular) Influence** (with Vikram Pathania), *American Economic Journal: Economic Policy*, Forthcoming.
2. **Contrast Effects in Sequential Decisions: Evidence from Speed Dating** (with Ray Fisman), *Review of Economics and Statistics*, Conditionally Accepted.
3. **Why Are Benefits Left on the Table? Assessing the Role of Information, Complexity and Stigma on Take-up with an IRS Field Experiment** (with Day Manoli), Under Review
4. **Does the Size of the Black-White Wage Gap Depend on Who's Asking? Evidence from the NLSY97** (with Dan Black, and Jeffrey Grogger)
5. **Law and Order: Sequential Contrast Effects in Judicial Decisions**

## **WORK IN-PROGRESS**

1. **The Affliction of Choice: Sub-Optimality in Health Insurance Decisions in the Field** (with George Loewenstein)
2. **Suffer the Children? New Evidence on the Hedonic Value of Children** (with Karim Kassam, George Loewenstein, and Carey Morewedge)
3. **Information, Incentives, and Impulsivity in Food Choice: Evidence from a Field Experiment of Online Food Purchases** (with Vikram Pathania)
4. **Media and Food Choice** (with Vikram Pathania)
5. **Under-Confidence and Goal Choice in the Labor Market: Evidence from 100,000 Employees and 250 Firms** (with George Loewenstein)
6. **Information, Choice Context, and Defaults in Low Income Savings Decisions: Evidence from a Field Experiment of Tax-Time Savings**
7. **The Economic and Psychological Determinants—and Deterrents—of Tax Compliance: An IRS Field Experiment with Paid Tax Preparers and EITC Filers**
8. **Mental Accounting, Loss Aversion, and Charitable Giving** (with Prasad Krishnamurthy, and Vikram Pathania)
9. **Job Search Intensity, Wage Preference, and Job Preference during an Unemployment Spell: New Evidence from Micro-Data on 8 Million Job Seekers** (with Tanya Menon)
10. **The Psychological and Economic Determinants of Wage: Evidence from Micro-data and a Field Experiment on Job Search** (with Tanya Menon)
11. **Does the EITC Lower Crime? Evidence from County-Level Data on EITC Filings**

## **GRANTS AND FELLOWSHIPS**

Berkman Faculty Development Grant, Carnegie Mellon University (2012)  
University of Chicago, Booth School of Business, Research Grant (2011, 2010, 2009)  
Russell Sage Foundation, Small Grant in Behavioral Economics (2009)  
Institute of Business and Economic Research Grant (2008 and 2006)  
Munich Summer Institute on Economics and Psychology (2006)  
U.C. Berkeley Graduate Division Summer Grant (2006 and 2005)  
U.C. Berkeley Dean's Normative Time Fellowship (2005)  
U.C. Berkeley Academic Progress Award Fellowship (2004)  
Robert D. Burch Center for Tax Policy and Public Finance Research Grant (2004)

## **INVITED PRESENTATIONS**

2012 Behavioral Economics Annual Meeting (BEAM); Cornell University; Carnegie Mellon University; Purdue University; University of Maryland; University of Wisconsin, Madison; Association for Public Policy Analysis and Management (APPAM) Annual Meeting  
2011 University of Chicago, Booth School of Business (Micro Economics); University of Chicago, Harris School of Public Policy; U.C. Berkeley (Public Finance); U.C. Berkeley (Psychology & Economics); Chicago Federal Reserve (Applied Economics); NCTC National Conference; University of Chicago, Booth School of Business (MOB)  
2010 University of Chicago, Booth School of Business (MOB); IRS-EITC All Employee Conference  
Pre- 2010 Harvard Business School (NOM); University of Chicago, Booth School of Business (MOB); U.C. Berkeley, Goldman School of Public Policy; U.C. Berkeley (Psychology & Economics); U.C. Berkeley (Public Finance)

## **REFeree SERVICE**

American Economic Review, Journal of Public Economics, Journal of Labor Economics, Journal of the European Economic Association, Management Science, Journal of Urban Economics

**PROPOSAL BUDGET - submission to National Bureau of Economic Research (NBER) HF Grant**

CMU Principal Investigator Saurabh Bhargava SDS

CMU SPEX TBD

Title: "The Affliction of Choice: Sub-Optimality in Health Insurance Decisions"

					PROJECT YEAR 1
	EFFORT %	Year Type	# of months	TOTAL FUNDS	2/1/2013
					9/1/2013
<b>PERSONNEL</b>					
Undergraduate Research Assistant to assist with data analysis, data management, and experiment administration for 15 hrs/week for 20 weeks at \$15/hr				\$4,500	\$4,500
<b>TOTAL SALARY</b>				\$4,500	\$4,500
<b>FULL TIME BENEFITS</b>				\$0	\$0.00
<b>TOTAL PERSONNEL</b>				\$4,500	\$4,500
<b>OTHER EXPENSES</b>					
Human subjects fees for proposed experiments. Budget includes 3 experiments of 200 subjects each @ \$15/subject.				\$9,000	\$9,000
Travel Expenses includes 2 conference presentations @ \$750/trip.				\$1,500	\$1,500
<b>TOTAL OTHER EXPENSES</b>				\$10,500	\$10,500
<b>INDIRECT COSTS (F&amp;A)</b>				\$2,250	\$2,250
<i>IDC base</i>				\$15,000	\$15,000
<b>DIRECT COSTS BY PROJECT YEAR - includes sub IDC</b>					\$15,000
<b>TOTAL COST BY PROJECT YEAR</b>					\$17,250
<b>TOTAL PROJECT COST @ CMU</b>				\$17,250	

<b>Total Direct Costs</b> <b>\$15,000</b>
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<b>Total IDC Base</b> <b>\$15,000</b>
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<b>Total Indirect Costs</b> <b>\$2,250</b>
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F&A RATE as per sponsor = 15.00%