GARY BAKER

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Education

(in progress)	PhD (Economics) – University of Wisconsin–Madison (expected completion: Spring 2021)
2017	MS (Economics) – University of Wisconsin–Madison
2014	BA (Concentration in Economics/Mathematics) – New College of Florida

References

Name	Prof. Lones Smith (Advisor)	**Name**	Prof. Daniel Quint
Institution	UW–Madison	**Institution**	UW–Madison
Position	Professor	**Position**	Associate Professor
Contact	lones@ssc.wisc.edu	**Contact**	dquint@ssc.wisc.edu
Name	Prof. Marek Weretka	**Name**	Prof. Elizabeth Kelly (Teaching)
Institution	UW–Madison	**Institution**	UW–Madison
Position	Associate Professor	**Position**	Faculty Associate
Contact	mweretka@ssc.wisc.edu	**Contact**	eskelly@wisc.edu

Dept. Proxy	Becca George
Position	Graduate Program Administrator
Contact	becca.george@wisc.edu

Research Interests

- Economic theory, Information economics, Statistical decision theory, Bargaining

Research Papers

- "Consumer theory for cheap information" (Job-market paper)

In Progress

- "Bayesian foundations for an asymptotically optimal experiment design," with Samuel Engle
- "Fast experimentation," with Lones Smith
- "Bargaining with multiple buyers: evidence from eBay"

Research Experience

Fall 2019 – Present	University of Wisconsin–Madison, Department of Economics *Project/Research Assistant for Professor Lones Smith*

Teaching Experience

Fall 2018 – Spring 2019 University of Wisconsin–Madison, School of Business
Business Learning Center TA - Economics 101

Summer 2018 University of Wisconsin–Madison, Department of Economics
Summer Research Mentor

Fall 2014 – Spring 2018 University of Wisconsin–Madison, Department of Economics
Teaching Assistant

- Economics 101: Principles of Microeconomics – Fall 2014 to Spring 2015
- Economics 102: Principles of Macroeconomics (Head TA) – Fall 2015
- Economics 711/713: Economic Theory (PhD level) – Spring 2016 to Spring 2017
- Economics 101: Principles of Microeconomics (Head TA) – Fall 2017 to Spring 2018

Fall 2012 – Spring 2014 New College of Florida
Teaching Assistant

- Intermediate Microeconomics – Fall 2012 and Fall 2013
- Ordinary Differential Equations – Fall 2013
- Econometrics – Spring 2013

Conference and Seminar Presentations

2020 Schwartz Lecture Theory Boot Camp
– Northwestern University (postponed due to COVID-19 outbreak)

University Service

May 2015 – May 2016 Associated Students of Madison
Student Council – Graduate Representative
– Chair of the Rules Committee and member of the Coordinating Council

Technical Skills

Languages Julia, Python (numpy, pandas), Matlab
Other software Jupyter, LaTeX, git, Emacs, Excel, GnuPG, OBS

Other Skills/Interests

Birding (since mid-2019, my bird photos can be found at either my eBird profile or my Instagram)
Parliamentary procedure (member of the American Institute of Parliamentarians since 2008)

Dissertation

Consumer theory for cheap information (Job-market paper)

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In many natural scenarios, a decision-maker facing uncertainty must decide not only *how much* information to purchase, but also *from which* sources. Unfortunately, an understanding of the value of information for general information structures is notoriously elusive. I characterize tradeoffs between samples from different sources in a setting with large information purchases where the probability of a mistake is small and well-described by large deviations theory. More specifically, in environments with finitely many possible underlying states, I provide an approximation for the marginal rate of substitution for samples from distinct information sources, valid when samples are sufficiently cheap (or budgets sufficiently large). I then show marginal rate of substitution is given by a ratio of precision-like indices that depend only on properties of each information source and the relative proportions of each signal in the bundle. This formula naturally implies a particularly accurate approximation for information demand in constrained settings. Furthermore, because the precision of each signal does not depend on decision-maker characteristics, all decision-makers—independent of prior and payoff structure—agree on the relative proportions of each source in an asymptotically optimal bundle. Of particular note: in environments with more than two possible states, interior solutions arise when the signals differ in which pairs of states they struggle to distinguish most. In this case, the asymptotically optimal bundle either occurs at a corner or at one of a finite number of interior kink points where the worst-case pair of states switches. To illustrate these results, I consider a number of basic consumer theory exercises and discuss implications for information demand.

Bayesian foundations for an asymptotically optimal experiment design (with Samuel Engle)

(In progress)

We consider the problem of a Bayesian researcher looking to optimally design an investigation into some unknown parameter of interest, θ, when multiple data sources (or experimental designs), possibly differing in cost per sample, are available. Because expected losses are typically impractical to compute or simulate, we consider an approximate solution that holds for large sample sizes (so when the researcher's budget is large). We show that the asymptotically optimal design uses data sources in proportions that maximize the Fisher information per dollar. Importantly, this criterion generically does not depend on the researcher's loss function, and thus is applicable in a wide variety of settings. Our approach provides a basis for a Bayesian approach to experiment design that escapes many of the inflexibilities of the usual frequentist approach. Specifically, we allow for comparisons of data sources that might have very disparate data generating processes, and thus would be difficult to compare under classical approaches. Furthermore, our results directly account not only for the statistical properties of a data source, but also its cost per sample.