

Chapter 1: Introduction to Research Agenda in Experimental Economics

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1. Introduction

Experimental economics is an empirical approach to understanding behaviour in economic transactions. Here researchers analyze decisions made by participants in a variety of economic “games” (or “experiments”) that have been specifically designed to simulate a particular economic transaction that the researcher wishes to study. Participants in such experiments are remunerated and the amount they receive depends on the decisions they make during the experiment.¹ By this definition, experimental studies that are not properly incentivized by either not paying participants or paying people a flat amount that is independent of their decisions are not properly called experiments. The same argument applies for other things such as discrete choice experiments that find application in a number of areas including health policy. (de Bekker-Grob, Ryan and Gerard, 2012).

As we complete the second decade of the 21st century, experimental economics is firmly entrenched in the mainstream of economics. So much so, that almost a decade ago Oswald (2010, p. 5) commented:

“...experimental papers are becoming common in the highest impact-factor journals... Some economists think that experimental-method papers may even take over as the dominant style of work. I am not sure; it is easy to get carried away with the latest fashions.... But true-experiment papers will surely make up a much bigger slice of the future of economics than has been common up to this point.”

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Noussair (2011) looks at trends in publishing in experimental economics for the first decade of the 21st century (2001–2010) by focusing on papers published in six general interest journals and three more specialized ones. Noussair reports that the number of experimental papers published in these nine journals increased from 260 between 2001 and 2005 to 456 between 2006 and 2010, a 75% increase.ⁱⁱ While there may be no real risk of economics becoming an experimental science in the near future, experiments are making rapid inroads into different areas of the discipline. But, equally importantly incentivized decision-making experiments are now finding increasing acceptance and application in other social sciences.

There was a long tradition of using experiments (though not always ones where participants were remunerated on the basis of their decisions) in psychology. In recent years there has been a much greater concordance between the two disciplines with psychologists paying more attention to monetary payments and reward salience and economists engaging in less structured (and less theory driven) experiments in order to understand the basic drivers of human behavior. Other sciences – both social and natural - have started adopting experimental games to study questions of interest: such as evolutionary approaches to understanding politics and political ideology, the evolution of cooperation and its consequent impact on cultural group selection and neuro-economics (which brings together scholars from economics, psychology, neurosciences and evolutionary biology.) Before I provide an overview of the volume's coverage, given our interest in reaching a wide cross-section of researchers, it might be useful to address a few questions (and concerns) that come up regularly in discussion of experimental methods.

2. Experiments in Economics and Psychology: Similarities and Differences.

Experimental economists are generally interested in how human beings make decisions in a variety of economic interactions, especially those requiring strategic thinking. Given this interest in decision-making, the research agenda of experimental economists has broad

overlaps with those of both cognitive and social psychologists. A partial list of ways in which experiments in economics and psychology differ appears below.

First, traditionally many, if not most, economics experiments were designed as tests of economic theories. Psychology, on the other hand, places less emphasis on writing down formal models of human behaviour and data collection often takes precedence. The development of “theory” in psychology typically follows the demonstration of empirical regularities in the data. It is only after voluminous data has been collected that a new theory or concept is coined in an attempt to explain those empirical findings. Second, economists are typically interested in understanding the impact of specific institutions (such as markets) or changes in those institutional structures on behaviour while in psychology there is less emphasis on institutional structure and constraints.

Third, experimental economists emphasize a clear incentive structure in the laboratory where the payments to participants are directly related to the decisions that they make. According to economists, the salience of the reward structure is what gets participants to focus on the task at hand and make good decisions. Psychologists often do not make performance dependent payments; choosing at times to reward participants with course credits, extra-credits, a fixed fee or random payments to a subset of participants. Psychologists also often emphasize the role of intrinsic motivation. In fact, some psychologists, as well as other social scientists, argue against providing salient monetary rewards which are task dependent. They argue that such extrinsically provided motivation in the form of monetary rewards to participants might, in fact, crowd-out intrinsic motivations, which is often the primary focus.

Finally, psychologists often use deception in their experiments while economists are typically opposed to this. Economists believe that if subjects are deceived in one experiment and are later informed about such deception then they might be less inclined to take the instructions at face-value in the next experiment. Subjects might automatically suspect

deception and assume that the experimenter actually wants to study something other than what the instructions suggest. Psychologists, on the other hand, believe that deceptions do not make a difference in behaviour and extensive de-briefings at the end of the session will take care of mistaken impressions and assumptions on the part of the participants. Psychologists also aver that in some experiments it is virtually impossible to address the research question adequately in the absence of such deception. See for instance the classic studies by Asch (1951, 1956) on conformity and by Milgram (1974) on obedience to authority. It is also the case that in recent years there has been considerable debate about what exactly constitutes deception. (Bonetti, 1998; Cooper, 2014)

However, it is safe to say that at present incentivised experiments where participants are paid on the basis of decisions made and are not deceived in any way (except under the most extenuating of circumstances followed by extensive de-briefing) constitute the gold standard in research in experimental social sciences.

3. Payment protocols in experiments

Above, I have already addressed why experimental economists insist on performance-dependent and salient rewards to motivate good decision. But, one topic that has generated controversy in recent times is: How do you pay subjects, especially, when they have interacted for more than one game or for more than one round, as is often the case?

The traditional approach is to pay for all games/rounds. But some argue that this may create a “wealth effect” implying that as the experiment progresses, the subject is earning more and more money, which may alter decisions. Given that the payments are small, this is not a big issue in my opinion. One way of avoiding this is to avoid telling subjects how much they are making over time. This is, obviously, easier if they are taking part in a series of distinct tasks as opposed to repeating the same task many times. At times information about earnings is crucial if one is interested in learning. One alternative proposed by those who are suspicious

of the “pay for all rounds” approach, especially where subjects are repeatedly undertaking the same task numerous times, is to select one round at random at the end of the session and pay for that round. But that does not necessarily solve the problem.

Suppose, in an experiment a subject makes 50 (100) decisions but is paid for only one of those. The subject then knows that each decision has only 1/50th (1/100th) chance of being relevant. This leads to a loss of reward salience since each decision now has a small probability of paying off; this is not all that different from survey responses. Finally, it has been argued by some that if the task is complex and there is significant learning involved, then it may make sense to pay for the very last round, which best reflects the subject’s facility at the task.

Merlo and Schotter (2004) explore this payment question in a series of experiments, where subjects are asked to make a prediction in a complex mathematical task. Getting the answer correct is difficult, and somewhat beside the point. The idea is to see how close subjects come to the correct answer (much like throwing darts and trying to hit the bull’s eye) and whether they get better at it (come closer to the correct answer) over time. Subjects in their experiments take part in two different treatments: *learn-while-you-earn* and *learn-before-you-earn*. As would be obvious from the names of the treatments, in the first one, the subjects earn a small amount of money in each round, as is the traditional practice. In the second treatment, however, subjects get to play a number of rounds without pay and then earn a much larger amount (a large multiple of the per-round earning in the *learn-while-you-earn* treatment) in the last round. Merlo and Schotter (2004) find that subjects who take part in the *learn-before-you-earn* treatment do much better at coming closer to the correct answer. This is, at least, partly because the subjects who get paid every round, adopt a more myopic approach where they focus on whether they “won” or “lost” in each round. The subjects in the other treatment, who did not have to worry about getting paid each round, engaged in much greater experimentation and in doing so ended up learning about the underlying problem much better over time.

Once again, there is no clear cut answer. Paying for a single random round may make sense if there are not too many rounds, especially if there are significant constraints on research budgets, as there often is. Another way of avoiding potential wealth effects is to not reveal earnings information during the session if this is practicable.

4. Oft-expressed concerns with experiments

In spite of the impressive growth that experimental economics has enjoyed in recent decades, there are still lingering questions about the external validity of experiments as articulated by Levitt and List (2007a, 2007b), who write:

“Yet unless considerable changes are made in the manner in which we conduct lab experiments, our model highlights that the relevant factors will rarely converge across the lab and many field settings.”

The implication here is that it is the results in field settings that matter and unless laboratory experiments can tell us something about behaviour in the field then these experiments are meaningless. In many ways this criticism echoes the traditional idea (Lipsey, 1999) that the only meaningful way to learn anything important about economic phenomena is to study economies in the wild or at least create “field” experiments that are close approximations of the natural economy. (E.g., Harrison and List, 2004; Carpenter et al., 2005) This view represents a misunderstanding of the role of experiments.

Experiments can play multiple roles. One of these roles is to test the empirical validity of economic theories; of course bearing in mind the caveat that such attempts may run into the Duhem-Quine problem (Harding, 1975).ⁱⁱⁱ But as Smith (1982) argues, to the extent that laboratory experiments do create a small-scale microeconomic society then the theoretical predictions that are supposed to hold true for complex real-life phenomena should still be valid within the controlled conditions of the laboratory. It seems to defy reason that theoretical

predictions that are wildly off the mark within the laboratory would still perform well in conditions with more confounds and more uncontrolled variables.

Another major role of experiments is to demonstrate empirical regularities and in doing so economic experiments essentially play the role of economic models that can lead to further theory building. Moreover, to the extent that many experiments are often comparing the impact on behaviour from changing various institutional parameters, it is not a big concern whether the experiments are carried out with the traditional participant pool of students or other non-traditional participants. In many cases the different pools will produce changes in behaviour in the same direction though perhaps of differing magnitude in response to different treatments. This may be of little concern if it is the direction of change (comparative statics) rather than its magnitude that is of primary interest. It is also the case that the differences in the behaviour of students and professionals are less pronounced than usually presumed. (Frechette, 2015).

The area where the issue of external validity does loom large is when experiments are utilized to design policy. Here there are two responses. If the data generated using student participants are considered unreliable then an obvious response would be to run the experiments with more sophisticated participants. The student experiments can be thought of as pilot studies guiding the design of further experiments with non-student subjects. But in many cases – as with the design of spectrum auctions – the questions are difficult enough that there are not too many other options besides relying on lab experiments prior to implementation in the field. Chapter 4 of this volume by Tim Cason, Lana Friesen and Lata Gangadharan highlights this point by showing how lab experiments in environmental management can serve as “wind tunnel tests” prior to field implementation.

As Camerer (2015) points out, while it is true that experimental results may not always translate directly to a particular context, it is also true that there might be problems with transfer between one field study to another. Given that a lot of parameters are specific to a particular

field context, it is not clear that results of these field studies are more generalizable to other contexts than the results of lab experiments. Camerer writes:

“The guiding idea here is ... “parallelism”...(the assumption) that the same general laws apply in all settings. ... For example, parallelism does not require that students in a lab setting designed to resemble foreign exchange traders behave in the same way as professional foreign exchange traders behave on trading floors.... The maintained assumption of parallelism simply asserts that if those differences could be held constant (or controlled for econometrically), behaviour in the lab and the trading floor would be the same. Put differently, if many experimental and field data sets were combined, with sufficient variation among variables like stakes, experience, and subject characteristics, a “Lab” dummy variable would not be significant (assuming it did not plausibly correlate with omitted variables).

Plott (1991) echoes the point that the emphasis on realism is misguided. Experiments are often designed to expose things that are hidden by nature. Therefore, designing experiments to replicate natural settings is not necessarily illuminating. Often the very simplicity of experiments is what makes them useful. According to Plott, economics is a study of principles that govern the behaviour of mankind in the ordinary business of life. Simple experiments are often sufficient to uncovering those principles at least in part because these principles are better understood not by studying them in equilibrium but by understanding the structure and institutions that govern that equilibrium.

Having said that, I also note that currently economists are carrying out extremely elaborate field experiments (at times referred to as randomized controlled trials) and the 2019 Nobel Prize in Economics went to three practitioners in this area. An excellent resource for an overview of this line of work is Banerjee and Duflo (2011), two of the winners of the 2019

Nobel Prize, the third being Michael Kremer. A similar example from other social sciences is provided by Henrich (2004).

5. Scope of this volume

The opportunity to put together this volume was both exciting and challenging; primarily because it was not immediately clear as to what topics the volume should cover. Incentivized experimental games are now used routinely in a wide range of fields. Given the increasing use of economic experiments in mainstream economics, this volume does not try and provide a comprehensive overview of this work. One intended group of readers include people working in areas that may not automatically turn towards using experiments in studying their own research questions. Here, the aim is two-fold: (1) to reach out to these potential readers and inform them of ways in which experiments are being used by pioneers in those fields and (2) to point out useful avenues of further research. To that end, the chapters in the volume are not intended to summarize work in those fields; but rather provide a selection of how experiments are being utilized to address interesting research questions and what potential future extensions are.

But, equally, we also wish to reach out to experienced experimentalists and point out how they can use the items in their tool-kit to address other interesting research questions that are amenable to experimental study. So our hope is to reach social scientists who want to learn about using experiments in their work as well as experimentalists who may be looking for new and exciting research ideas that rely on the experimental methodology. We will consider this volume to be successful if it managed to start fruitful conversations, and hopefully collaborations, between the two groups of researchers identified above.

The volume is then deeply influenced by this desire to take an inter-disciplinary view and to talk to people who may not routinely think of running experiments in pursuing their research agenda. A different editor may have chosen an entirely different set of topics and

contributors. These choices then reflect both my own preferences and my assessment of what some of the more promising areas for further study are.

The current volume is divided into two parts. Part 1 consists of five chapters that are more “economic” in focus, while Part 2 contains four chapters that cover topics, which venture further afield. Chapter 2 by James Tremewan and Alexander Vostroknutov, provides an elegant and tractable way of pinning down what social scientists mean when they talk about social norms. (Bicchieri, 2006, 2016; Chaudhuri, 2009; Elster, 2009; Skyrms, 2004). As the authors point out, there seems to be no general acceptance of what social norms are and whether these are rules that members of a society “are” abiding by or “ought” to. Given the importance and ubiquity of appeals to social norms, both to explain behaviour as well as to make policy recommendations, the authors provide a way in which we should approach the topic; important distinctions that we should bear in mind and how we can design experiments that address and analyze related yet distinct components of the concept of norms. This chapter may be a little technical for some readers but the effort will be worthwhile. In any event, researchers will still gain a lot of insights from the chapter even if they completely skipped the mathematical bits.

In Chapter 3, Alice Guerra moves from norms to explicit rules and laws. She considers applications of experimental methods to legal issues focusing primarily on three areas: bargaining and the Coase theorem; pre-trial settlement and the litigation process; torts and liability rules. As Guerra points out, understanding how people’s behavior interact with the law is crucial for any policy-maker, who seeks to use the law to encourage socially desirable behavior and discourage socially undesirable ones. The question of how legal institutions shape individuals’ incentives and how people respond to changes in their legal environment remains a relatively unexplored area. But the area is eminently suitable for study using experimental methods and recent decades has seen the emergence of substantial research in experimental law and economics. Taking off from the previous chapter by Tremewan and Vostroknutov,

Guerra suggests that the role of social norms and preferences in legal bargaining have received less attention than other economic parameters such as transactions costs. Exploring the role of such norms in the context of Coasian bargaining, pre-trial settlements and tort litigations may well be a fruitful area of further research. But those who wish to embark on that research agenda will be well served by the insights provided in the Tremewan and Vostroknutov chapter.

Chapter 4 by Tim Cason, Lana Friesen and Lata Gangadharan continues the regulatory theme set by Guerra and summarize experimental studies that focus on environmental regulations and compliance. I am sure I do not need to emphasize the importance of this line of research given our current focus on climate change issues. Among other things, Chapter 4 highlights the scope of experiments that according to Roth (1995) “*whisper in the ears of princes*”. These are experiments with enormous policy implications. As Cason et al. point out, one significant advantage to these experiments is that they can serve as “wind-tunnel tests” prior to actual implementation of a particular policy, which is typically resource intensive and the costs of getting the implementation wrong can be high. As Cason et al. point out,

“for novel policy approaches, the data required for empirical testing are simply unavailable, either in a timely fashion, or at all. Laboratory experiments provide perhaps the only opportunity to explore empirically different policy options and counterfactuals. Field experiments are also useful to explore new regulatory policies—but they can be more difficult to conduct.”

This has been true for other areas such as the auctioning of broad-spectrum radio-waves. (McAfee and McMillan, 1996; Binmore and Klemperer, 2002). But it is only recently that we have applied an experimental lens to environmental regulations and the authors of this chapter are among the pioneers in this area.

In Chapter 5, Pushkar Maitra and Ananta Neelim take on yet another huge area: behavioral development economics. However, in recognition of the fact that this broad area

contains numerous potential subject matters, Maitra and Neelim focus on one such sphere, *entrepreneurship*. This choice is motivated by the fact that the formal sector in developing countries often fails to generate enough employment leading people to depend on other sources of employment, generally characterized by low levels of formality and low productivity. Further, returns to education and experience in the formal labor markets are low in developing countries relative to high-income countries. All of this makes entrepreneurship a critical vehicle of economic growth in developing countries. Maitra and Neelim provide an overview of behavioural preferences and non-cognitive traits that affect entrepreneurial choice and success.

John Gibson rounds out Section I with a chapter on behavioural nudges on health. This is a relatively short chapter, which reflects, in part, the paucity of work in this area and the significant scope for further research. As Gibson points out, while much work in this area adopts the sobriquet of “experiments”, these are not typically incentivised and are more along the lines of survey responses. Gibson also points out that this area presents lots of potential applications of randomized controlled trials (RCTs) that have recently become highly popular in other areas of economics such as economic development. But, the area of behavioural health appears to have remained somewhat immune to the RCT revolution. In his chapter, Gibson provides an overview of existing incentivised experiments in health and suggests that this area remains particularly fertile for application of experimental techniques.

Section II begins with a chapter on gender and leadership written by scholars who have had significant impact in this area. Differences in the economic decisions and labor market outcomes of women and men are widely documented and sit squarely within the purview of economics. The reason I have chosen to place this chapter in the second section is that in spite of the immediate relevance of the topic to economics, it still inspires considerable controversy, even now at the end of the second decade of the 21st century. The other reason for the chapter’s placement here is the inter-disciplinary nature of the topic, which elicits interest from

researchers in diverse fields ranging from sociology and feminist studies to psychology, management and leadership.

Eckel et al., focus primarily on the gender gap in leadership roles and start by summarizing gender differences in preferences that are related to women's willingness to lead. Then they consider the selection of women as leaders and gender differences in perceptions, beliefs, and behaviour contributing to the leadership gap. They address the literature on stereotypes and discrimination, which play important roles in the evaluation and selection of women leaders and conclude with a discussion of possible interventions, their effectiveness and policy directions.

With Chapter 8, we begin to venture further away from economics. In this chapter Kyle Fischer, Quentin Atkinson and Ananish Chaudhuri provide an overview of experiments that aim to understand political beliefs and preferences. Traditionally, political scientists have tended to take a unidimensional view of political ideology, placing people along a liberal-conservative (left-right) spectrum. Liberals are generally egalitarian, more open to novelty, and supportive of redistributive policies, while conservatives are more concerned with preserving and enforcing traditional values, group conformity, and justifying existing hierarchies (Jost et al., 2003). However, scholars across diverse disciplines have repeatedly and independently found two primary dimensions of political ideology, often referred to as economic conservatism (vs. economic progressivism), and social conservatism (vs. social progressivism).

Recently, Claessens et al. (2020) showed that there is a striking concordance between these dual dimensions of ideology and independent evidence for two key shifts in the evolution of human group living. First, humans began to cooperate more, and more widely. Second, humans became more group-minded, conforming to and enforcing social norms in culturally marked groups. They propose that fitness trade-offs and environmental pressures have maintained variation in these tendencies to cooperate and conform, naturally giving rise to the

two dimensions of political ideology. In Chapter 8, Fischer et al. start with an overview of studies that adopt an unidimensional view of politics before going on to discuss the nascent, yet growing, work on the dual foundations of political ideology.

Chapter 9 tackles neuroeconomics. In this chapter, Sarah Cowie, Ian Kirk and Olav Krigoloson explore examples of how a combination of neuroscientific, psychological, and economic approaches has shed light on why we behave in particular ways, over and above what any one of these individual approaches can reveal. This chapters focuses on specific examples of research that has made a contribution to the understanding of how decision-making depends on expected value, emotion, and personality, and how learning and decision-making are influenced by prediction error, delay, ownership, and cognitive load. These examples demonstrate how experiments have answered key questions or posed novel questions that set the direction for future research.

Chapter 10 by David Dickinson looks at the impact of sleep or lack thereof on decision-making. Dickinson, who has undertaken path-breaking work in this area, points out that a large number of adults across countries suffer from insufficient sleep. Poor sleep, in general, impacts not only physical but also behavioural health via the type of thought processes used during decision making. Research into how adverse sleep states impact decision making stems from a larger research agenda on bounded rationality and the role of cognitive loads on decision-making. This chapter surveys the research on sleep and decision making with a focus on decision paradigms that use rigorous and incentivised methods common to the field of experimental economics. Dickinson provides an overview of methodological issues for those who may wish to undertake this line of work and then goes on to review the research on adverse sleep states and high-level decision making, which covers both individual and social/interactive decisions.

6. Acknowledgements

I am deeply grateful to all the contributors for taking the time to write the chapters. I believe that together they constitute a major and exciting resource for researchers and provide pointers for fruitful future avenues of research. I ended up learning an enormous amount from each of the chapters. The contributors to this volume have devoted enormous amount of time and effort in crafting very high-quality chapters at my request and I am deeply indebted to all of them for agreeing to do so.

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Finally, I owe a debt of gratitude to Alex O'Connell at Edward Elgar who approached me with the idea of putting this volume together. I would not have thought of doing this had Alex not approached me. I am delighted that we have managed to make progress through the Covid-19 pandemic and will, hopefully, be able to see the results of our efforts in printed form in the near future. I hope that you enjoy reading this volume and that it leads to fruitful cross-disciplinary conversations in the future.

Nga mihi nui.

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Endnotes:

ⁱ The terms “experimental economics” and “behavioural economics” are often used interchangeably in common parlance. But traditionally there has been a dichotomy between these two research areas. Experimental economists were those who hailed primarily from a background in economics and used incentivized economic experiments to test theoretical propositions. Behavioural economics, on the other hand, referred to that branch of study, which attempted to infuse neo-classical economic models with psychological insights such as bounded rationality as well as heuristics and biases. But in recent times there has been greater blending of the two, caused by the natural overlap in the research agenda of these two streams. So much so, it is probably not controversial to say that at present that branch of economics, which infuses neo-classical economics with insights from psychology is given the nomenclature of “behavioural economics” with incentivised decision-making experiments (or experimental economics) being a powerful tool-kit in the behavioural economist’s arsenal.

ⁱⁱ The six general interest journals include the American Economic Review, Econometrica, the Review of Economic Studies, the Quarterly Journal of Economics, the Journal of Political Economy and the Economic Journal. The three specialized journals are Games and Economic Behavior, the Journal of Economic Behavior and Organization and Experimental Economics.

ⁱⁱⁱ The Duhem–Quine thesis or the Duhem–Quine problem, named after Pierre Duhem and Willard Van Orman Quine, suggests that it is impossible to test a scientific hypothesis in isolation. This is because any empirical test of the hypothesis requires one or more auxiliary assumptions or auxiliary hypotheses. So, even if a theory is falsified, it is not clear whether this is because the theory is wrong or whether because one or more of the auxiliary assumptions are wrong.