

BE and EE: Cousins but not twins

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Abstract

While behavioral economics and experimental economics are largely aligned and share many similarities, they also share differences. Behavioral economics is a collection of theories and models while experimental economics is a tool. The clear union of behavioral and experimental economics allows for a continual growth of knowledge. Behavioral models are refined through observed behavior in the laboratory and observed laboratory behavior yields new behavioral models. Behavioral and experimental economics can very much follow a cycle. Both have become valuable tools to policy makers around the world.

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Introduction

Standard economic theory assumes individuals are purely rational and selfish beings. It is assumed that individuals undertake optimal decisions that maximize their own payoffs. What happens when actual individual behavior contradicts standard economic theory? Behavioral economics incorporates alternative assumptions about human behavior and has grown in popularity in the past decades, with Nobel Laureates who are considered to be behavioral economists. Behavioral economics allows a more flexible interpretation of standard economic theory that has been found to better reflect actual observed individual decisions. While the models in behavioral economics provide fascinating insights despite its relatively new development, it is critical to perform direct tests of the validity of these models to further reinforce the conclusions drawn and the importance of this emerging subfield of economics.

As behavioral economics grew in popularity, simple thought experiments performed by psychologists formed the basis for many of the models. Pioneering work in experimental economics goes back at least as far as the Smith (1962) seminal paper on the double-auction market, which opened the door for publishing research involving experimental economics. The modern tool of experimental economics really gained steam in the late 1980's and early 1990's. The rise of laboratory experiments facilitated direct tests and helped fuel the tremendous expansion of behavioral economics in the past 30 years. Experimental economics and behavioral economics have evolved into well-respected and useful methods and tools that continue to develop today. Quite a few universities now have a dedicated experimental economics laboratory and offer both experimental and behavioral economic courses at both the undergraduate and graduate level.

While behavioral economics and experimental economics are largely aligned and share many similarities, they also share differences. *On one level, behavioral economics is a collection of theories and models while experimental economics is a tool.* Behavioral economic theoretical predictions do not always match behavior observed in the laboratory. Economics experiments are not needed to answer every research question in behavioral economics (and indeed, cannot), while not every economic experiment is designed to answer a research question in behavioral economics. The clear union of behavioral and experimental economics allows for a continual growth of knowledge. *Behavioral models are refined through observed behavior in the laboratory and observed laboratory behavior yields new behavioral models.* Behavioral and experimental economics can very much follow a cycle.

Both have become valuable tools to policy makers around the world. Many governments have formed specific groups composed of economists who specialize in behavioral and experimental economics (for example, the Behavioural Insights in the U.K., behaviouralinsights.co.uk). Before the introduction of experimental economics, policy makers typically relied on theoretical predictions, results from previous policy interventions, and intuition. The introduction of economic experiments allowed for the initial testing of proposed policy interventions prior to a full implementation. Policy makers can now test policy interventions based on theoretical predictions, as can also design policy interventions without a theoretical basis using economic experiments both inside the laboratory (as a test bed) and in the field. While some policy interventions are too complex to be tested using an experiment, the inclusion of behavioral considerations in policy recommendations has also led to many successful interventions.

As Al Roth (1995) noted in the Handbook of Experimental Economics, economic experiments can serve many purposes, which he categorizes as “Speaking to Theorists”, “Searching for Facts”, and “Whispering in the Ears of Princes”. While experiments designed to speak to theorists are those experiments specifically designed to test theoretical predictions, experiments designed to search for facts do not require a theoretical basis and may serve to isolate a specific behavioral pattern that the theory has not yet modeled. Al Roth describes the experiments designed to answer policy-related questions as those for “Whispering in the Ears of Princes”.

The remainder of this article is organized as follows. Section 2 provides a more in-depth explanation of the power and scope of behavioral economics while Section 3 adds details about the strength of using economic experiments as an analysis tool. Section 4 compares and contrasts behavioral economics versus experimental economics while Section 5 compares and contrasts the differences in policy implications across behavioral economics and experimental economics. Section 6 concludes.

Behavioral Economics: What is it?

The Oxford dictionary defines psychology as: “The scientific study of the human mind and its functions, especially those affecting behavior in a given context”. As enthusiasm for interdisciplinary work continues to grow, behavioral economics creates a logical link between psychology and economics where the “given context” is a situation involving economic decision-making. Having evolved into a more mainstream topic in the late 1900’s, behavioral economics has now found its way into the Oxford dictionary as well. Behavioral economics is defined as, “A method of economic analysis that applies psychological insights into human behavior to explain economic decision-making”.

Models in behavioral economics allow for departures from standard economic theory. *Specifically, behavioral economics diverges from both the purely rational component of standard economic theory and the purely selfish component of standard economic theory.* Whereas standard economic theory might categorize certain decisions as “mistakes”, behavioral economic models can explain the basis for many of these decisions. Indeed, they may not only include explanations for these decisions, they may well provide reasons why these are actually not mistakes. Let’s look at some examples.

While the rationality assumption assumes that individuals will always maximize a well-behaved monotonic utility function, individual behavior frequently violates this assumption. One example of this is time-inconsistent preferences, where decisions made at different points in time reveal contradictions to the standard model. When people are offered a choice between \$5 today and \$6 tomorrow, they choose \$5 today, while when offered a choice between \$5 in 365 days and \$6 in 366 days, they choose \$6 in 366 days. When the immediate option is available, individuals are unable to delay gratification. However, if both options require waiting, individuals

are more likely to wait the additional time for the additional money. Standard economic theory views these choices as mistakes, stating that one should view the one-day delay the same regardless of the starting point. Behavioral-economic models are able to incorporate the potential for time-inconsistent preferences.

Neoclassical economic theory presumes that individuals should always make decisions in consideration of their own financial payoffs, without regard to anything or anyone else. But it is rather clear that this is not fully accurate. Consider philanthropy in the United States, for example. In 2015, individuals donated \$373.25 billion dollars to various charities (National Philanthropic Trust). Standard theory rules out such behavior, while behavioral economic models incorporate the utility gained from charitable contributions into the utility function. Some other examples of the divergence between standard theory and behavioral-economic theory are framing effects, heuristics, reciprocity, and weighting functions, just to name a few.

Another simple example is the famous Ultimatum Game (Güth et al. 1982). Two individuals are paired up anonymously and one individual has the power to determine how to share the pie with the other individual. The individual receiving the offer can then choose to either accept the offer or reject the offer. If the offer is rejected, both individuals receive \$0. People frequently reject offers for a small share of the pie, instead electing to take \$0 and assign \$0 to the proposer of said small share. Standard economic theory cannot explain a rejection of any positive amount offered. Behavioral-economic models are able to incorporate this sense of reciprocity and fairness considerations that standard economic models fail to address.

As with any economic field, important research questions in behavioral economics need to be tested. As mentioned, behavioral economics is not such a tool, but it does provide ideas that can be tested in complementary experiments. While many questions in behavioral economics can be answered using readily-available data, others can only be addressed through the results of carefully designed experiments. To the extent that economics claims to be a science, one must test the interesting hypotheses that spring from the behavioral models.

Experimental Economics: What is it?

Experimental economics borrows a great deal from experimental psychology with a few major differences. Psychology experiments typically do not involve incentivized decisions and they typically permit deception. Both economic and psychology experiments are traditionally conducted in laboratories on university campuses and typically have university students as the subjects. In addition, there are lab-in-the-field experiments and pure field experiments on more general populations; these approaches are sometimes viewed as having greater external validity but they generally provide less experimental control. We see experiments as natural complements for the notions put forward by behavioral theorists. While

experiments are traditionally designed around *ex-ante* theoretical predictions, experiments may also uncover surprising patterns of behavior that will then be utilized to construct more descriptive theoretical models *ex post*.

What do economic experiments contribute to the literature that traditional analyses fail to add? There are many research questions, both interesting and important, that existing data cannot readily answer. Either there are no such field data, such data are highly incomplete, or there are serious confounds causing identification problems. Whereas exogenous shocks in field data may be rare and are difficult to confirm as exogenous, experiments provide such control and can pinpoint many of the interesting and important questions that are otherwise left unanswered with exogenously assigned treatments. With traditional data, the researcher is at the mercy of the coded dataset. However, with experiments, the researcher has the freedom and control to (at least in principle) determine each and every detail. The value of the results of economic experiments lies much more in the identification of treatment effects, specifically the direction of the observed effect rather than the size of the effect or the levels involved, as with traditional analyses. Additionally, economic experiments allow for numerous replications whereas research using field data can be replicated only if another similar dataset exists.

Experimental economics is much more a tool than a method of thought. Research is not restricted to questions specific to the agenda of behavioral economics (although of course experiments are inevitably behavioral in a broader sense), but can also address issues in labor economics, macroeconomics, markets, etc. Experimental economics is a tool in much the same way as regressions and simulations are tools. The type of regression and variables entered into the regression are like a recipe that produces an answer to a research question; one can think of an economic experiment in a similar manner. A researcher has many options when designing an experiment and each detail is an ingredient that helps to produce and validate the final conclusions. Should the design follow a between-subjects or within-subjects design? What feedback should subjects receive? How should one incentivize decisions? Just like an applied researcher must defend each specification of the analysis and the identification strategy, an experimenter must be able to defend each design element.

Experimental economics has also proved to be a valuable teaching tool. More and more undergraduate economic courses are including in-class experiments to teach some of the basic and foundational concepts such as supply and demand, long run equilibrium, price floors, and the tragedy of the commons just to name a few. It is clear that experimental economics is an invaluable tool both inside the classroom and for the advancement of knowledge through original research. While both valuable, behavioral and experimental economics share many similarities as well as differences. We illustrate these in the next section.

Similarities & differences

We have emphasized that behavioral economics is a subfield of economics while experimental economics is a powerful analysis tool. We also noted that many behavioral-economic research questions can be answered with an economic experiment but may also be answered with field data. Economic experiments, while typically used to answer behavioral questions, can also help answer policy-related questions. There is significant intersection between behavioral and experimental economics, however no set contains the other.

There are times that behavior observed in an economic laboratory experiment substantially diverges from existing behavioral-economic theory. One example of this is the winner's curse problem in [Charness and Levin \(2009\)](#). Neither level-k models nor cursed-equilibrium models can explain the observed behavior, showing the need for improved models. There are also times when behavioral economic theory does a good job of predicting behavior observed in the laboratory, particularly qualitatively. An example of this is guilt-aversion and the behavior observed in [Charness and Dufwenberg \(2006\)](#). And sometimes the predictions match some but not all of the behavior observed, as seen in [Charness et al. \(2014\)](#). Here many of the theoretical predictions were matched qualitatively by the network behavior, but there were also regularities present that were not predicted by theory.

One nice feature about the intersection of behavioral and experimental economics is that with each related question, the web of research continues to expand. Experimental data that contradicts behavioral economic theory might cause researchers to view the question in a different manner, revising the original theory, resulting in new conclusions that are testable with another experiment. It can be an iterative process that significantly adds to the wealth of knowledge about human behavior.

Both behavioral and experimental economics have limitations, particularly when considered separately. While behavioral-economic theory has a fundamental and firm mathematical basis, it cannot confirm the accuracy of actual human behavior. Experimental economics (more so laboratory experiments) is limited by concerns about external validity concerns. Can the behavior of undergraduate students playing games in a laboratory for an hour for small amounts of money accurately depict true behavior? While the financial stakes in a laboratory experiment are small, if the stakes were too small to alter behavior, no treatment effects would ever be observed; this is obviously not the case. Enough replication of laboratory experiments has validated many of the conclusions drawn from these experiments. Additionally, observed laboratory behavior has matched behavioral-economic predictions often enough to reflect the validity of these models. Behavioral economics inherently deals with external validity, in that it deals with actual behavior rather than presumed behavior, using either experimental or field data. One important quest for behavioral-economic theory is to provide more of an over-arching framework rather than the piecemeal approach

often followed in psychology. The strength of experimental economics is its ability to cleanly identify treatment effects, which are likely to persist across environments (see [Falk and Heckman \(2009\)](#)).

[Charness \(2015\)](#) states: “Sometimes one needs a hammer and sometimes one needs a screwdriver. They are both useful tools. To say that one is better than the other seems a bit odd”. Behavioral economics and experimental economics are very much complements and not substitutes. While not perfect complements since each has independent value, behavioral and experimental economics are definitely a dynamic combination.

BE, EE, and policy implications

Many economists are in one way or another involved in policy research. The introduction of behavioral and experimental economics created a nice bridge between these new emerging areas of research and the more traditional area of policy research. Both behavioral and experimental economics have found their way into public-policy decisions around the world. Many governments have a collection of economists that specialize in behavioral and experimental economics that provide policy recommendations. While behavioral economics can provide predictions about behavioral responses to proposed policy interventions, economic experiments both in the field and in the laboratory provide an initial test of the behavioral responses to these proposed policy interventions.

In many economic experiments designed to address potential policy recommendations, experimenters create an environment either in the laboratory or in the field that as best as possible mirrors the true environment in order to provide more valid conclusions.

Within the United States, both the Federal Reserve and the Federal Trade Commission among other departments hire economists who specialize in behavioral and experimental economics. The British government established the Behavioural Insights Team to provide behavioral and experimental economic expertise. Let us provide an example of the work done by these groups. The Consumer Protection Bureau at the Federal Trade Commission performed a recent survey aimed at determining which individuals would be more susceptible to falling victim to fraud due to false advertising ([Anderson 2016](#)). While the survey provides correlations as opposed to causation, surveys such as this provide the initial test for potential policy interventions including how effective policy interventions may differ across groups such as gender. In these types of situations where no particular theory has predictions about human behavior, experiments and surveys can provide helpful insights into actual behavior. When important policy questions about topics such as central banking are being considered, creating valid and informative experimental designs may be challenging. In these situations, predictions from behavioral-economic theory will provide more valuable information.

Sometimes the process involves multiple stages. Predictions from behavioral-economic models may provide hypotheses, and while a laboratory experiment may serve as the initial test to help pare down the effective policy interventions and provide evidence for which interventions are effective for which groups of people, often this first stage is not the final stage. Occasionally, policy makers perform a second stage where they implement a “partial” policy intervention in the field. For example, many businesses are interested in “going green”. Hotels for example use a great deal of water to wash the bed sheets and towels daily. Policy makers are interested in interventions that will reduce the amount of water used by hotels by guests opting to not have their bed sheets changed or reusing their towels for multiple days. How can hotels get guests to opt-in? Behavioral economic models of altruism and warm glow may provide a jumping off point for how to persuade guests to opt-in. As a first stage, policy makers may form a list of suggested wordings to present guests with when they check-in to the hotel based on these models of altruism and warm glow. A laboratory experiment can test which wording choices are most effective in getting guests to opt-in can narrow down this list. As a second stage, the government may then ask a few hotels to implement these wording choices at random and then observe which wording choices are most effective at these “test” hotels. After this, policy makers may then have all the information necessary to make a final policy recommendation to all hotels.

As you can see, there are certain scenarios where experiments are particularly informative and others where predictions from behavioral economic models suffice due to the complex nature of the particular question.

Conclusion

In this article, we have discussed how behavioral and experimental economics are both complementary and yet distinct. Behavioral economics is a body of thought that includes valuable theoretical insights. Experimental economics is a valuable tool that can provide useful insights and test theoretical predictions in controlled environments. At the same time, each area is separate. Experiments have been quite useful in testing standard theory (for example, the double-auction experiments beginning with [Smith \(1962\)](#)) and behavioral economics also includes more standard empirical techniques with field data.

Still, experimental and behavioral economics can work well hand-in-hand: Behavior is observed in the world, leading to theoretical models that may depart from standard paradigms. Controlled experiments can be utilized to test these models and to deliver new insights, which can in turn generate more descriptive behavioral models in a virtuous cycle. This has important implications for policy as well, since behavioral models can suggest policy interventions that can be tested in both the laboratory and the field.

In the old Sufi saying, “There are many ladders to the same roof”. Perhaps stacking these ladders together will

enable researchers to reach higher levels of knowledge.

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