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Crossing the Valley of Death Between Academic Research & Effective Policy: The Role of Behavioral Economics

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**For: Morris Altman, Editor,
Constructing a More Scientific Economics**

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Abstract

The impact of carbon dioxide generated by fossil fuels on global warming has been known for 164 years – ever since a creative scientific paper was published in 1856. The mean annual temperature of the Earth has been rising at least since 1880, perhaps earlier. Public trust in scientists is at an all-time high, while public trust in political leaders is at an all-time low.

Why, then, has the academic community been unable to translate its consensus on the climate crisis, into effective immediate political action? Why have political systems nearly everywhere been unable to cross the Valley of Death between scientific evidence and public policy regarding greenhouse gases? Specifically, why have economists proven ineffective at getting their research findings on climate change, and other key social issues, implemented by the political system and understood by the public

I provide an explanations for the irrelevance of Economics – its two wrong turns, that rejected the behavioral approach of Marshall in favor of the sterile mathematics of Walras, and the obsessive cleansing of Economics of all ethical or moral judgments, dating from Lionel Robbins' influential 1930 essay. I also welcome a sea change in how Economists study the world – harnessing behavioral economics within the framework of individual initiatives and collective action, rather than waiting for a broken political system to heed science.

The way forward to relevance and credibility for economics, I argue, lies through RCT's – randomized controlled trials, in which the methodology of scientific experimentation joins with the theoretical insights of behavioral economics. By joining the insights of behavioral economics with the rigor of scientific experiments, Economics' relevant is being restored.

Introduction

In his research, John Tomer had laser-like focus on relevance and clarity. In reviewing his list of publications, I found these topics: Intangible capital, organizational capital, how our brain works, Buddhist economics, adverse childhood experiences and poverty, economic decision-making, “nudging”, obesity, productivity, social responsibility, long waves...and many more.

John’s tools were words, not mathematics. He made no Nobel-worthy breakthroughs. But the total body of his work adds significantly to our understanding of economic behavior and how to improve wellbeing – always at eye level, always grounded in the real world, and understandable, mostly jargon-free.

From its inception some 38 years ago, SABE – Society for the Advancement of Behavioral Economics -- sought to apply economics to making the world a better place, based on a deep understanding of human behavior. Over the years, SABE members, economists, and scientists in general, have in their research identified challenges in the way society, economy and polity impact our lives and have offered suggestions for small and large improvements. John Tomer was instrumental in reviving and then managing and leading SABE.

However, as the Yiddish expression goes, we often “spoke to the walls”. If we were to list the winning ideas of science that the political system has utterly ignored, we would need many volumes. As I look back on my own body of work, and that of John Tomer and others, I am struggling to understand why. *Why is there a ‘valley of death’ between the well-founded research and evidence of science and the policies implemented by political leaders? Why do so many good ideas die? Why are so many bad unfounded ideas implemented?*

The concept of ‘valley of death’ has been used widely in a different context, as the often-fatal ‘desert’ between basic scientific research and its commercial applications.¹ I believe that while this particular ‘valley of death’ does exist, it is nearly equaled in destructive impact by the valley of death between research findings and public policy. “Listen to the science”, we hear often. But if policymakers did listen, why would we have to even say this? And if evidence-

¹ Valley of death describes a period in the life of a startup in which it has begun operations but has not yet generated revenue. It reflects a startup company's cashflow burn plotted on a graph. During this period, the company burns up initial equity capital provided by its shareholders and goes bankrupt, before markets can recognize the value of its products and services. Great ideas born in research labs die in the valley of death, before creating value for the people.

based policy is as self-evident as evidence-based medicine – why is a self-evident principle so widely ignored?

In this essay, I offer an explanation for the perceived irrelevance of my own discipline, Economics. I will argue that Economics made two wrong turns that together have made its policy prescriptions at best ignored and at worse, destructive when rarely heeded. My case study is the climate change crisis. The solution I prescribe: Behavioral economics, driven by randomized clinical trials.

Climate Crisis

The world has been aware for an exceptionally long time that carbon dioxide acts like a blanket, warming the world – in fact, since 1856, 164 years ago. In that year, a remarkable woman scientist named Eunice Foote published the results of a clever experiment. She filled glass jars with water vapor, carbon dioxide, and air, respectively, and compared how much they heated up in the sun. “The highest effect of the sun’s rays I have found to be in carbonic acid gas (CO₂),” she reported, in The American Journal of Science (Foote, 1856).

Foote’s work was ignored, not the least because she was a woman. But a male counterpart, Thomas Chamberlin, published this finding in 1899:

“When the temperature is rising after a glacial episode, the ocean gives forth its carbon dioxide at an increased rate, and thereby assists in accelerating the amelioration of climate.

“...In periods of sea extension and of land reduction (base-level periods in particular), the habitat of shallow water lime-secreting life is concurrently extended, giving to the agencies that set carbon dioxide free accelerated activity, which is further *aided by the consequent rising temperature* which reduces the absorptive power of the ocean and increases dissociation.”

So, at the very point in history when automobiles with internal combustion engines burning fossil fuels were being invented and produced, science already understood the effect of carbon dioxide on global warming. Close inspection of Fig. 1 below shows that a key inflection point – when global temperatures ceased falling or staying constant and began to rise – coincided with the production of the first Model T cars, by Henry Ford. Atmospheric carbon dioxide (parts per million) and average annual global temperatures track each other almost perfectly. And these two variables have coincided for a very long time.

Foresight was possible. Economic theory might have proposed a carbon tax as early as 1908, when the first of 15 million Model T cars was produced. Or, in 1920, 1930, 1940? But perhaps hoping for foresight is impossibly idealistic. Let us then plead for hindsight policy.

Over a century after the launch of the first Model T car, we have a climate crisis. Let us suppose that the data in Figure 1 were already being tracked starting in 1880. Suppose also that scientists were regularly updating it. At what point would political leaders and the citizenry and electorate begin to understand that humanity is facing a global warming crisis? In 1954? 1964? 1974? 1984?

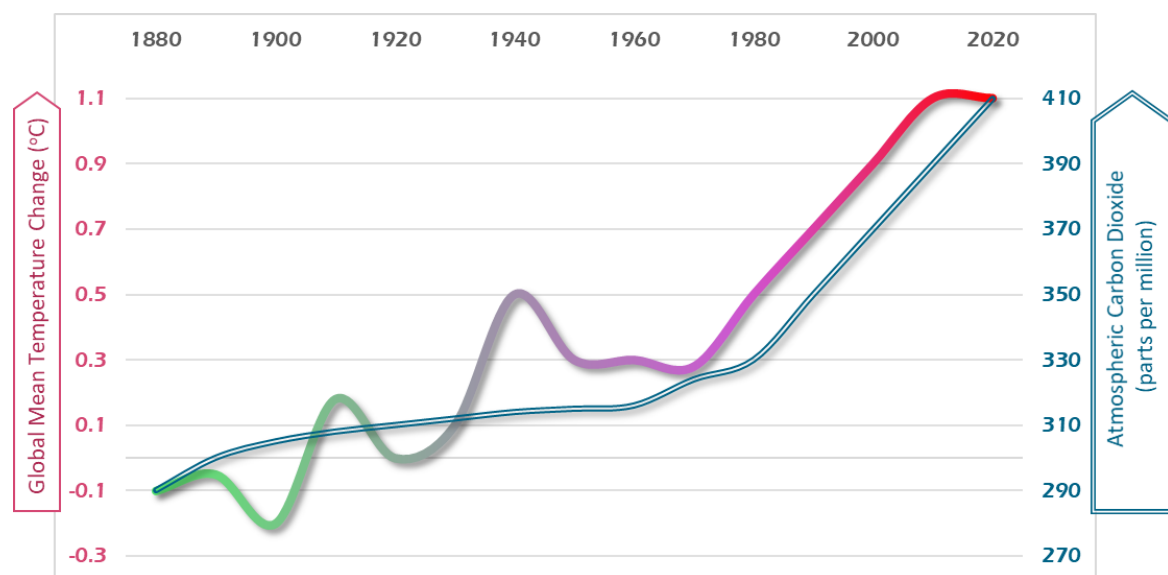


Figure 1. Global Mean Temperature Change vs. Atmospheric Carbon Dioxide (parts per million), 1880-2019 ²

How strong does a correlation need to be, together with the causal science underlying it, until humanity widely believes there is need for immediate effective action and policy change and strongly supports such action, even if it means incurrent short-term loss?

² Source: <https://www.climatecentral.org/gallery/download/global-temperatures-and-co2-concentrations>

And how is it, after the alarm bells sounded by Nicholas Stern and the Stern Report (2010), that in 2020, there is a significant minority of people and their political leaders -- who look at Figure 1 but who do not see it.

Climate Change Mitigation

When were the first global policy actions taken to mitigate carbon emissions and the resulting global warming? When did Eunice Foote's 1856 observation migrate to public policy?

The Kyoto Protocol extended the 1992 United Nations Framework Convention on Climate Change (UNFCCC) that commits state parties to reduce greenhouse gas emissions, based on the scientific consensus that global warming is occurring and it is extremely likely that human-made CO₂ emissions have predominantly caused it. The protocol was adopted in Kyoto, Japan, on 11 December 1997.

Christopher Napoli, writing in the SAIS Review of International Affairs, observed: "At the end of 2012 the commitments under the Kyoto Protocol will expire. As is well known, a majority of countries will not meet their emissions reduction targets, and the agreement has failed to produce significant changes in norms with respect to emissions reduction." (Napoli, 2012).

If Kyoto was a failure, what about the Paris Agreements? The Paris Agreement is an agreement, also within the United Nations Framework Convention on Climate Change (UNFCCC), dealing with greenhouse-gas-emissions mitigation, adaptation, and finance, signed in 2016.

Studies published in Nature have shown that as of 2017, "none of the major industrialized nations were implementing the policies they had envisioned and have not met their pledged emission reduction targets...and even if they had, the sum of all member pledges (as of 2016) would not keep global temperature rise well below 2 °C."³

³ Victor, David G.; Akimoto, Keigo; Kaya, Yoichi; Yamaguchi, Mitsutsune; Cullenward, Danny; Hepburn, Cameron (3 August 2017). "Prove Paris was more than paper promises". *Nature*. 548 (7665): 25–27. Bibcode:2017Natur.548...25V. doi:10.1038/548025a. PMID 28770856. See also:

Rogelj, Joeri; den Elzen, Michel; Höhne, Niklas; Fransen, Taryn; Fekete, Hanna; Winkler, Harald; Schaeffer, Roberto; Sha, Fu; Riahi, Keywan; Meinshausen, Malte (30 June 2016). "Paris Agreement climate proposals need a boost to keep warming well below 2 °C" (PDF). *Nature*. 534 (7609): 631–639

Why Don't People Trust Economists?

Pew Research Institute regularly surveys Americans, to determine the degree of their trust in scientists. From 2016 through 2019, there has been a steady rise in trust, already at a high level in 2016. Some 86% of Americans trust scientists “a great deal” or “a fair amount”, up in 2019 from 76% in 2016.⁴

Economists, in contrast, regularly score very low in public trust. Economists perform much worse on similar trust surveys than scientists, judges and doctors. A 2017 British survey revealed these troubling findings:

- » “Half of the respondents... think that economists express views based on personal and political opinion than on verifiable data and analysis.”
- » Nearly two thirds (64%) think that the government should listen to the advice of economists regarding the national and global economy. But when asked what economists do, nearly two thirds of respondents choose forecasting. Only 26% see economists advising government on policies and 33% on industry regulation
- » Nearly three quarter of respondents feel that public figures (such as Brian Cox in physics and Sir David Attenborough in natural history) are important for communicating their subjects. When asked to name economists of this kind in the public eye, only around 16% were able to provide any names according to our own analysis of responses. Of all respondents, less than 1% mentioned a researcher as an economist in the public eye and around 6% mentioned an economic journalist.
- » Another reason cited for lack of public trust was economists’ inability to speak to the public in understandable plain language.⁵

So – the public believe economists mainly do forecasting. And research shows economists have a worse-than-dismal record at macroeconomic predictions.⁶

⁴ Source: <https://www.pewresearch.org/fact-tank/2019/08>

⁵ “Prof Birdi said there was an absence of recognized spokespeople for the economics profession. “I’m not sure economists have found a language to speak to the ordinary public, even though they see economics as a useful secret knowledge that some people have which has not been translated,” he said.” Source: Financial Times [<https://www.ft.com/content/52458788-fcc0-11e9-98fd-4d6c20050229>].

⁶ “In February [2019], Andrew Brigden, chief economist at London-based Fathom Consulting, worked out that of 469 downturns since 1988, the International Monetary Fund had predicted only four by

I believe there is a clear historical reason for the failure of Economics. Economics took two wrong turns. One wrong turn will take you out of your way. Two wrong turns will get you hopelessly lost.

Two Wrong Turns

The first wrong turn, in 1890, was embracing the seductive math of Leon Walras and rejecting the pragmatic behaviorism of Alfred Marshall. The second was embracing Lionel Robbins' call to sterilize economics and rid it of all value judgments.

The goal of each wrong turn was to make Economics more 'scientific', interpreted as more mathematical – in order to make a perceived right turn, so economics would be more like the queen of all sciences, physics. The result was in fact to make economics' 20th C. prescriptions at best irrelevant, at worst destructive.

Alfred Marshall was a distinguished professor at Cambridge University. He wrote a landmark textbook on Economics. In it, he defined the subject:

“Political economy or economics is a study of mankind in the ordinary business of life; it examines that part of individual and social action which is most closely connected with the attainment and with the use of the material requisites of wellbeing. (Marshall, 1890: Opening sentence, Book 1, Chapter 1.)⁷

Marshall did not shy away from ethics or value judgments. For example, he wrote: “Although then some of the evils which commonly go with poverty are not its necessary consequences; yet, broadly speaking, the destruction of the poor is their poverty, and the study of the causes of poverty is the study of the causes of the degradation of a large part of mankind.”

the spring of the preceding year. By the spring of the year in which the downturn occurred, the IMF was projecting 111 slumps, fewer than a quarter of those that actually happened. In a post on his firm's website, Brigden wrote that while IMF economists monitoring Equatorial Guinea, Papua New Guinea, and Nauru can walk tall for their recession calls, the rest pretty much flopped. “Since 1988 the IMF has never forecast a developed economy recession with a lead of anything more than a few months,” he says. Source: <https://www.bloomberg.com/news/articles/2019-03-28/economists-are-actually-terrible-at-forecasting-recessions>

⁷ Source: <https://www.marxists.org/reference/subject/economics/marshall/bk1ch01.htm>

But Economics did not embrace Marshall's value-laden behavioral pragmatic approach. Instead, economists embraced the mathematics of Walras. As Prof Milton Friedman famously said: We curtsy to Marshall but we walk with Walras. Alas.

Who was Walras? He was the son of a famous French economist, Auguste Walras. Perhaps fleeing from the overpowering shadow of his father, Walras enrolled in the *École des Mines de Paris*, but grew tired of engineering. Then he is known to have worked as a bank manager, journalist, romantic novelist and railway clerk – failing in all of these endeavors, before, as a last resort, turning to economics.

In 1874 Walras published his master work, taking some of the physics and math he learned at *École des Mines* and transplanting it to Economics, focusing on the fundamental concept of general equilibrium. The tool of mathematics and the concept of general equilibrium quickly became dominant – even though economic systems are rarely in equilibrium, and even though human behavior can rarely be captured effectively in mathematical models.

But there was a more serious wrong turn to follow, in 1930. It came in a powerful essay by Lionel Robbins, a professor at London School of Economics (Robbins, 1930). Ironically, Robbins' highly influential essay, cleansing Economics of any ethics or moral judgments, came precisely at a time when such value judgments became crucial, when the world entered the disastrous decade-long Great Depression and millions sank into poverty, hunger and joblessness.

Robbins, like Walras, begins by rejecting totally the study of the “human animal”:

“Why the human animal attaches particular values...to particular things is a question which we do not discuss. That is quite properly a question for psychologists or perhaps even physiologists.

Robbins has to admit that people *are* in fact involved with Economics:

“...the propositions of analytical economics ... do most unquestionably involve elements which are of a psychological – or perhaps better said a psychical – nature...explicitly recognized in the name by which they are sometimes known – the subjective or psychological theory of value.” (p. 86).

Value is indeed subjective and psychological in nature. Yet Robbins firmly discards exploring psychological motivation, stressing that prices and markets are the stuff economists know and study.

But Robbins' heavy guns are mainly trained on ethics:

“Economics, says Mr. Hawtrey (a well-known economist of his day), “cannot be dissociated from Ethics. Unfortunately it does not seem logically possible to

associate the two studies [Ethics and Economics] in any form but mere juxtapositions. Economics deal with ascertainable facts; ethics with valuations and obligations. The two fields of enquiry are not on the same plane of discourse. Between the generalizations of positive and normative studies there is a logical gulf fixed which no ingenuity can disguise and no juxtaposition in space or time can bridge over. ...Propositions involving the verb 'ought' are different in kind from propositions involving the word 'is'. And it is difficult to see what possible good can be served by not keeping them separate..." (p. 148-149).

Two wrong turns. Eliminate behavior from Economics, and then sterilize it of morals, ethics, good and bad, right and wrong, cancel 'ought' forever – and you have a discipline instantly irrelevant and hopelessly lost.

Behavior and values drive policy. Economics, driven by Walras and Robbins, chose not to play.⁸ The resulting Valley of Death becomes both wide and deep – and largely impassable.

The Way Forward: Vaccine Vision

By a miracle, a discipline hopelessly lost now seems to have begun to find its way. Increasingly there *are* economic policy prescriptions that are valid, relevant, understandable – and are being implemented. Somehow, Economics has found its way back to being behavioral, as Marshall wished, and truly scientific, not via the mathematics of theoretical physics but through the true scientific method for conducting research – randomized controlled trials (RCT).⁹

⁸ A strong example is the widely-embraced concept of Pareto-optimum: "An allocation is Pareto optimal if there is no alternative allocation where improvements can be made to at least one participant's well-being without reducing any other participant's well-being." Having the biggest possible pie, even if the slices go mainly to the very rich, is Pareto-optimal (you could tax the capitalists to help the poor but let's be real, they skillfully use their resources in "democratic" systems to prevent it). This will get you the greed-is-good global financial collapse of 2008.

⁹ A randomized controlled trial is a type of scientific experiment that seeks to reduce certain sources of bias when testing the effectiveness of new treatments; this is accomplished by randomly allocating subjects to two or more groups, treating them differently, and then comparing them with respect to a measured response. One group—the experimental group—receives the intervention being assessed, while the other—usually called the control group—receives an alternative treatment, such as a placebo or no intervention. The groups are monitored under conditions of the trial design to

“To truly influence policy,” Amir et al. (2005) noted 15 years ago, in their influential paper “Psychology, Behavioral Economics & Public Policy”, “researchers will have to invest substantial effort, and moreover this effort will have to be directed differently from standard research practices..... the experimental design should closely resemble reality...”

It took many decades – but the methodology and results of behavioral economics, built on controlled experiments with groups of people, have now become mainstream. And in 2019, three scholars won the Nobel Prize for Economics for their pioneering work in using RCT methodology to build credible policy prescriptions – Esther Duflo, Abhijit Vinayak Banerjee and Michael Kremer.

In his Nobel lecture, Banerjee asserted rightly that “economics has changed, in part as a result of ...the credibility revolution. And partly because RCT’s have evolved from their initial adherence to the model set up by medical trials.” (Banerjee, 2020, pp. 1937-1938).

Consider the global 2020 pandemic and the frantic effort to design and produce a vaccine. Before administering them to the public, vaccines are thoroughly tested in three-stage clinical trials. These random controlled-access trials involve those who receive the vaccine, and a control group that receives a placebo. People are assigned randomly to the two groups, and do not know to which group they belong. Very few people would agree to being vaccinated, unless they knew the vaccine had been tested in this manner.

Duflo observes, in her Nobel lecture, that in the UK “economist [are] among the least trusted professionals regarding their own field of expertise... only politicians are perceived with more distrust.” (Duflo, 2020, p. 1952) Duflo notes she ultimately came to believe that “economic science could be leveraged to make a positive change in the world”... through randomized controlled trials.

Methods matter. How economists do research matters greatly. Kremer notes in his Nobel address that “field experiments created an opportunity for a fundamentally different type of economics research that can complement other approaches in important ways.” (Kremer, 2020, p. 1975).

Economics has undergone a revolution. It is no longer led by those who, like the late legendary J.K. Galbraith, wrote memorably about The New Industrial State and claimed proudly that he had never in his life set foot in an actual

determine the effectiveness of the experimental intervention, and efficacy is assessed in comparison to the control.

factory. It is driven by field research, using modified randomized controlled trials, with behavioral foundations, and readily willing to embrace and examine value judgments that drive economic policy. Economists increasingly tackle practical policy issues, such as, how to reduce teacher absenteeism, not by mathematically modelling 'lack of desire to come to work', but by studying teachers in the field and conducting experimental interventions.¹⁰

Conclusion

Economics is a behavioral science. So is sociology. Sociologists have never ever used Purell sterilizer to cleanse itself of all ethical and moral germs. Quite the opposite. Sociologists have made such judgments an integral part of their research, as scholars. I believe that sociology has never faced a Valley of Death, like that of Economics, as a direct result. Sociologists never sought to cleanse 'behavioral' from their discipline's value proposition, as Economists did.

This year, 2020, the Nobel Prize in Chemistry was awarded to two remarkable female scientists who invented CRISPR (clustered regularly interspaced short palindromic repeats), a powerful method for editing genes with infinite potential for curing disease and enhancing health. It has been used already to develop tests for COVID-19.

The 2020 Nobel Prize for Economics was awarded to two brilliant economists, to Paul R. Milgrom and Robert B. Wilson, "for improvements to auction theory and inventions of new auction formats." The Milgrom-Wilson auction theory has already found use by governments. But one has to ask, during a global pandemic, is auction theory the main contribution of Economics to dealing with a massive global crisis? CRISPR vs. auction theory? And does no-one see the incredible disproportion between what is perceived as Chemistry's contribution to the world – and that of Economics?

Nobel Prizes reflect the past. Happily, for Economics, in the present, behavior is back. It is unthinkable today that an editor of the American Economics Review

¹⁰ Duflo and Abhijit Banerjee [they are a married couple, who both teach at MIT] have studied India extensively (Banerjee is Indian born). In 2003, Duflo conducted a trial experiment on teacher absenteeism in 120 schools run by a non-profit group. She encouraged the teachers to photograph themselves with their students each day, and in this way she was able to reduce their absenteeism. The practical intervention was an experiment, that reached empirically valid tested prescriptions, using randomized controlled trials.

would refuse even to send for review a submitted article on behavioral economics, rejecting it with a cynical quip.¹¹

Economics has now begun to cross the Valley of Death, led by those who live and work in the real world, and who subject policy prescriptions to the same degree of scientific rigor that we use for pharmaceuticals and vaccines. And – not a moment too soon.

¹¹ In the early 1970's my wife Sharona, a school psychologist, and I wrote an article that interpreted subjective interest rates as the willingness to defer gratification and related this to how economic inequality is generated. The AER editor rejected our submission, out of hand, claiming that "the poor are experts at deferring gratification, they do it all the time." See Maital & Maital (1978).

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