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# What Can Medicine Teach the Social Sciences?

by LEE MCINTYRE\*

Editor's Note: In a field as slow to change as the law, it is often helpful to inject fresh perspectives from other disciplines. As different as legal analysis might be from that found in the medical and social sciences, they are all ultimately concerned with the pursuit of objectivity. Furthermore, in each of these fields, the pursuit of academic and practical goals are permeated and influenced by the values of those that seek to achieve them. Indeed, both the law and the social sciences in particular are fundamentally concerned with finding ways of distilling logic and order from the complexities of human behavior. Thus, there is much to be learned from how medicine and the social sciences reconcile these often competing goals, a comparison artfully explored by Lee McIntyre in the following editorial.

In the debate over whether social science can someday hope to achieve the same degree of scientific rigor that has been met in natural science—usually taken to consist of physics, chemistry, and biology—it is often argued that there are insuperable limits to what can be attained in the study of human behavior.<sup>1</sup> In the natural sciences, many contend, we are dealing with a subject matter about which we can pursue inquiry dispassionately, with little concern for how the knowledge will be used once it is gathered and few worries that our objectivity may be clouded by the close relationship that we bear to the subject of inquiry. Not so, it is argued, in the study of human behavior. In social science we have a vested interest not only

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1. For a discussion of such alleged limits, see Lee McIntyre, *LAWS AND EXPLANATION IN THE SOCIAL SCIENCES: DEFENDING A SCIENCE OF HUMAN BEHAVIOR* (1996).

in the truth or falsity of competing theories about what causes behavior, but also in how these theories may be used to shape the social environment. Even if a science of human behavior were in principle possible, some hold, it could not be realized due to the inevitable biases that we bring to the study of a subject matter about which we care so deeply.

Of course, the last forty years of the philosophy of science has done much to disabuse us of the notion that objectivity is so easily purchased even in natural scientific inquiry; indeed, the history of some of the greatest scientific debates over the last 500 years—from Copernican astronomy to Darwinian evolution—has demonstrated just how closely the concerns of natural science may tread upon the egocentric assumptions that are inevitably present in any scientific endeavor. But, notwithstanding the question of whether objectivity in any science is perfectly achievable, can't the case be made that natural science has done pretty well for itself? Despite the challenges of normativity and subjectivity, natural science has thrived. Can one reasonably hope that in the fullness of time the same might be true of the social sciences?

In considering this question it is fruitful to remember not merely that physics, chemistry, and biology are not value free, but also that these three sciences do not exhaust the realm of successful scientific advancement over the last few centuries. Indeed, despite the fact that most philosophy of science focuses almost exclusively on a narrow set of issues that arise out of physics and biology, we see in *medicine* an example of a comparatively recent scientific revolution that occurred despite enormous closeness to the human issues at stake, and that bears a close resemblance to the current situation in the social sciences.

Medicine, like social science, doesn't fit well with the "dispassionate" ideal that is allegedly met by good scientific practice. Values permeate the science of medicine. A physician wants his or her patients to remain healthy. Disease and death are regarded as the enemy. Knowledge is gathered in the hope that it may be used to cure the sick and to prolong the life and well-being of all patients. Nonetheless, modern medicine is firmly based on a footing of science. Today's medical practices are founded on double-blind clinical trials and exacting statistical work done by medical researchers. Despite the over-arching desire to gather knowledge that may be used to cure disease and to alleviate suffering—which are normative values—medicine is well served by the conviction not to let its practical goals cloud the vision of what can actually be learned from experience.

Why? Because it is no benefit to the patient for a physician or researcher to pretend to see what is not really there.

In its mission to gather knowledge despite the entanglements of normativity and subjectivity, social science faces a challenge not unlike that of medicine. In macroeconomics, for instance, practitioners are concerned with the “health” of the economy and have a value-laden orientation toward the subject matter. Except in the most unusual circumstances, economists want unemployment to be low and productivity to be high. Inflation, in most cases, is bad. A growing stable economy is viewed as the goal of virtually all macroeconomic analysis. Values thus permeate inquiry in macroeconomics in that economists gather data and try to learn from it primarily in order to achieve a desired outcome.

But why, then, is the scientific status of medicine taken to be so different from that of social science? Why do so many people accept the idea that medicine is a science but that economics could not be? It couldn't be solely due to such problems as normativity and subjectivity, for surely these are challenges that are shared by both fields. Indeed, the very success of medicine *despite* the values that permeate it belies the argument that it is impossible to achieve scientific success in the face of a subject matter that is of direct human concern. Does this provide reason for thinking that—once it embraces the proper methodology—social science too may become more scientific?

### **The Youngest Science**

Medicine was not always scientific. Although it is easy to forget in an age of routine inoculations and miraculous transplants, the successes of medicine were hard won against the ignorance of basic human pathogenesis that existed as recently as a century ago. During the Enlightenment, there was great hope that medicine would finally be able to lift itself out of the long dark period of superstition and ignorance that had characterized its early history. With the shining example of the Scientific Revolution in physics laid before it, efforts were made to throw off the Scholastic tradition of settling scientific matters by argument rather than by experiment, in the hope of basing medical knowledge on a firm foundation of science. These hopes were largely frustrated, however, until well into the 19th century, when the work of Pasteur and Koch led to the new field of bacteriology. With the gradual acceptance of the germ theory of disease and the rise of several public health measures based on

empirical methods, it was only after 1860 that medicine truly began to undergo its own scientific revolution.<sup>2</sup>

It is well to remember, however, that for all of the talk about the beginnings of a science of medicine in the mid-19th century, it was only in the mid-20th century that clinical practice was able to catch up and fulfill the therapeutic promise of this new science. Even in the early decades of the 20th century, a doctor's role was largely confined to explaining the course of a disease to the afflicted patient, not intervening in its path. Even basic physical examination was not universally practiced, as many physicians instead preferred to take lengthy histories and offer voluminous prescriptions that were little more than placebos. In the words of Lewis Thomas, in his memoir of medical practice in the 1930s,

Explanation was the real business of medicine. What the ill patient and his family wanted most was to know the name of the illness, and then, if possible, what had caused it, and finally, most important of all, how it was likely to turn out. . . . For most of the infectious diseases on the wards of the Boston City Hospital in 1937, there was nothing to be done beyond bed rest and good nursing care.<sup>3</sup>

Another writer paints a similarly grim portrait of medical practice during this era:

Twentieth-century medicine was struggling for the scientific footing that physics began to achieve in the seventeenth century. Its practitioners wielded the authority granted to healers throughout human history; they spoke a specialized language and wore the mantle of professional schools and societies; but their knowledge was a pastiche of folk wisdom and quasi-scientific fads. Few medical researchers understood the rudiments of controlled statistical experimentation. Authorities argued for or against particular therapies roughly

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2. It is of course controversial to claim that a scientific revolution starts at any particular time, and in medicine it is no different. Some scholars would date the beginning of the scientific era in medicine as early as 1628, when William Harvey discovered the circulation of blood. Others would mark it at various advances that took place in the 18th century. But, as Roy Porter points out in his book *The Greatest Benefit to Mankind*, it was only after the founding of bacteriology in the mid-19th century that the clinical promise of medicine was based firmly on a foundation of experimental discovery and scientific rigor that "led directly and rapidly to genuinely effective preventive measures and remedies, saving lives on a dramatic scale." Roy Porter, *The Greatest Benefit to Mankind* 428 (1999). Surely this constitutes a revolution.

3. Lewis Thomas, *THE YOUNGEST SCIENCE: NOTES OF A MEDICINE-WATCHER* 28, 35 (1983).

the way theologians argued for or against their theories, by employing a combination of personal experience, abstract reason, and aesthetic judgment.<sup>4</sup>

All of this changed with the discovery of penicillin in 1940. In the pharmacological revolution that followed—which brought sulfa drugs and antibiotics into routine use—medicine at last began to enjoy in clinical success the fruit of the scientific revolution that had started 80 years earlier. With the success of the new drugs, the old ways of practicing medicine began to wane, with the home remedies and palliatives of bedside consultation soon replaced by drugs that had resulted from laboratory research and large scale clinical trials. Medicine, at last, had become a science.

### **Prescription for the Social Sciences**

To the student of history, what is most impressive about the story of medical science is not just its success but its *recency*. To the methodologist what also jumps out is the challenge, “if medicine can do it, why can’t social science?” Indeed, note just how accurately the quoted descriptions of medicine in the 1930s might, with just a few changes in wording, be used to characterize the impoverished state of social scientific knowledge and its effect on public policy at the dawn of the 21st century.

Of course, some would argue that the comparison is false; that the problem of subjectivity is much worse in the social sciences than it is in any other field of inquiry in that we face a unique challenge by being both the investigator and the object of inquiry. Given this, some hold, we cannot help but to proceed in a way that is less than scientific.

The problem with this view is not that subjectivity is not a real problem in social science. The problem is that subjectivity is often used as an excuse for conducting bad social science. Yes, it is hard to be objective in the study of our own behavior. Yet, if the critics are right, and we cannot hope to achieve perfect objectivity in any scientific study, then one might rightfully ask why the social sciences cannot hope to do at least as well as the natural sciences in this regard? After all, it is these same flawed, self-interested human beings that conduct natural science who do social science as well. Success in contending with subjectivity could not in social science, any more so than in natural science, depend on *perfect individuals* who

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4. James Gleick, *Genius: THE LIFE AND SCIENCE OF RICHARD FEYNMAN* 132 (1992).

are beyond the ken of subjectivity. As we see throughout the history of natural science, the investigation of nature too has individuals who prefer their own theories and are inclined to ignore evidence that does not fit them. But, when properly conducted, science as a whole is more objective than its practitioners, for science progresses by discovering the mistakes of others. Indeed, it is the appeal to evidential standards that keeps science as objective as it is. Thus, wishful thinking in science is rooted out not because of unique intellectual honesty amongst scientists, but because of the fear of public embarrassment against objective standards.

Yet here we face what may well be a real difference between the practice of natural and social science. For in natural science, even if one realizes that it cannot be achieved perfectly in practice, there is healthy respect for objectivity as an *ideal* and a conviction that the only means of resolving a scientific dispute is to appeal to the *evidence*. In natural science, the extent to which we bring ideological factors to bear on our inquiry is to be *repudiated*. Yet, in the social sciences, the importation of our political and social interests too often seems to be accepted as part and parcel of the way that research is conducted.

This is not to say that in social science the evidence is ignored completely, or that social scientific theories are made up out of whole cloth. It is rather to say that in much of social science, unlike natural science, the practitioners are not nearly so embarrassed about mixing up their ideological assumptions with positive inquiry. Much of what passes for social research these days consists of those who already know what policy they would like to support gathering evidence in its favor. Consequently, a good deal of social science is so ideological in its orientation that the very idea of fashioning social science as the empirical study of human behavior has, to many practitioners, become something of a disciplinary joke. As one social scientist has put it:

[M]ost of the most influential work in the social sciences is ideological, and most of our criticisms of each other are ideologically grounded. Non social scientists generally recognize the fact that the social sciences are mostly ideological, and that they have produced in this century a very small amount of scientific knowledge compared to the great bulk of their publications. Our claim to being scientific is one of the

main intellectual scandals of the academic world, though most of us live comfortably with our shame.<sup>5</sup>

Unfortunately, within such a politically charged research environment, even where careful empirical work *has* been done, it is almost routinely ignored or dismissed by policy makers.

A recent example, drawn from the field of criminal justice, will suffice to make the point. One of the most overlooked ills of the American judicial system is the problem of wrongful convictions. In light of the growth of mandatory sentencing guidelines and a diminishing national reluctance to employ capital punishment, however, the charge to be certain that those convicted are actually guilty of the crime is of paramount importance. As a recent survey of the problem has pointed out, “[e]ach year, in the United States, more than seventy-five thousand people become criminal suspects based on eyewitness identification, with lineups used as a standard control measure.”<sup>6</sup> It has been well known for decades within the annals of social science research, however, that eyewitness reports are notoriously inaccurate. Nonetheless, the criminal justice system continues to put great weight on eyewitness testimony; in consequence, the most common cause of wrongful convictions is eyewitness error.<sup>7</sup>

Some may object that, flawed though it is, we have no choice but to consider the testimony of eyewitnesses, and should weigh it appropriately. The use of lineups as a means for assessing the accuracy of eyewitness recall, however, reveals at least one way in which the current methodology could be vastly improved.

The most common way of presenting a lineup is to show an eyewitness a group of several people all at once, including one or more actual suspects. This method of presentation, however, has been shown to introduce subtle pressure to choose one of the individuals presented, and consequently leads to a higher rate of false identification. As the research of Gary Wells and Rod Lindsay has shown, however, presenting culprits one at a time, and asking eyewitnesses to decide in each case whether this is or is not the perpetrator, leads to 50% fewer false identifications, while not

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5. Charles Leslie, *Scientific Racism: Reflections on Peer Review, Science, and Ideology*, 31 SOC. SCI. & MED. 891, 896 (1990).

6. Atul Gawande, *Under Suspicion: The Fugitive Science of Criminal Justice*, NEW YORKER, Jan. 8, 2001, at 50.

7. *Id.*

effecting correct ones.<sup>8</sup> One might think, based on such dramatic results, that the use of sequential lineups would become widespread. Yet, despite a 1999 report by the Department of Justice that extolled the virtues of sequential lineups, only a handful of police departments—mostly outside the United States—have adopted them. In social science, subjective factors all too often trump empirical evidence.

Must it be like this? Does lack of perfect objectivity in practice necessitate the abandonment of the objective ideal and a corresponding neglect of the scientific attitude? Must the subjective nature of our interest in human behavior color the way that we conduct social inquiry? Of course, we cannot turn off our interests, hopes, and fears, when we are engaging in science. But what we *can* do is attempt to keep them from blinding us to what our inquiry is trying to tell us.

Here once again it is instructive to consider the example of medicine. In medicine we have an example of a science in which we have tremendous vested interests, yet where we realize that there is no purpose served in allowing wishful thinking or ideology to influence our analysis of how things are. Our overriding interests in medicine, like in social science, are *normative*. We have a practical goal in mind when conducting our inquiry; we know at the outset what it is that we value. Yet in medicine we do not use normativity as an excuse to abandon scientific standards: to cherry pick data to support a favored hypothesis or otherwise abuse statistics. Aiming at objectivity—even where it is not completely reachable—is an important aspect of any scientific inquiry. In social inquiry, subjectivity need not serve as a barrier to the scientific attitude any more than it does in natural science or medicine.

### **Prognosis**

Given the potential for the social sciences to learn from and model their approach to inquiry on the methodological situation faced by medicine, may we expect the revolution anytime soon in the study of human behavior? No. For it is worth pointing out here that there *is* something missing in the social sciences—that was developed in the science of physics in the 17th century and the science of medicine during the 19th century—that has misfired in the social

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8. R. C. L. Lindsay & Gary L. Wells, *Improving Eyewitness Identification From Lineups: Simultaneous Versus Sequential Lineup Presentations*, 70 J. APPLIED PSYCHOL. 556, 561 (1985).

scientific revolution that was hoped for after the Enlightenment. It is respect for the critical attitude that teaches us to acknowledge the vastness of our ignorance and the superiority of empirical methods when it comes to gathering knowledge about matters of fact. No matter the complexity of the subject matter, this is the first and most essential step toward scientific inquiry. To accept the *ideal* of the scientific attitude toward gathering knowledge—even when it cannot always be met in practice—is the mark of a field that is ready to move forward as a science.

Too often in social inquiry the practitioners think that they already know the answer to the question of why people go to war or commit crime, based on intuition or our allegedly special access to the subject matter of social science, so that we do not need to engage in any empirical investigation.<sup>9</sup> Unfortunately, many also eschew careful empirical inquiry in the social sciences because they fear the consequences that it may have for their most closely held political beliefs about human nature.

But this is to surrender to the worst side of subjectivity. And, it is worth remembering that the history of scientific progress has been one of relentless assault on such prejudices. The early practitioners of medicine were little assisted in their understanding of the human heart despite the fact that they each had one; their understanding of disease was scarcely advanced by the fact that they could also fall ill. Mocked by failure, medicine eventually turned to science as a model for gaining knowledge about a subject that quite simply could not be understood in any other way. The same is true in the study of human behavior. As in medicine, it is no favor to a sick society—one plagued by racism, war, crime, and child abuse—to pretend that we know what causes such problems when we do not. As in medicine, the social sciences will be doomed to play an ineffectual role in improving human life until they have gathered enough knowledge in a systematic way to be of more use in public affairs.

To some the prospects for such a revolution may appear dim. But, with the proper methodology, relatively rapid progress is possible. In the 17th century in physics and in the 19th century in medicine, who could have imagined the enormous success that would be enjoyed when empirical and experimental methods were finally employed? The case for a science of human behavior should be no less compelling. And, as in medicine, the world awaits the outcome.

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9. It is interesting to note that this Aristotelian philosophy of relying on reason over empirical inquiry was once popular in gaining knowledge about nature, before the Galilean revolution in physics.

Just as numerous patients died of infectious diseases before there was a cure for them, today's society suffers from numerous plagues of our own making that we are powerless to stop until we understand their true causes.

In the study of human behavior, no less than in the study of health and disease, it is no favor to let our values interfere with gathering the empirical knowledge that is necessary to ameliorate our suffering and to cure our current ills.

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