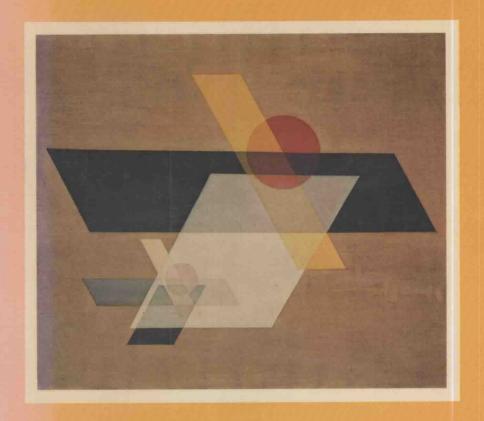# KENNETH R. HOOVER

THE ELEMENTS OF SOCIAL SCIENTIFIC THINKING

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The College of Wooster

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For
Lee Armstrong Hoover and Margaret Whitcomb Hoover
with memories of wisdom and love

PREFACE

This little book is not very complicated. It is, rather, an initiation to social science intended both for those who need to know how to evaluate the results of social science and for those who are taking their first steps as researchers. Where do concepts come from? What is a variable? Why bother with scientific thinking? How is a hypothesis different from other sentences about reality; how is it similar? These and other fundamental queries are dealt with here. The operational advice on research is elaborated only as

far as is required to gain a foothold on understanding scientific inquiry. Throughout, the emphasis is on reality-testing as the process by which we can know what to make of the world. The presentation of science is not parochial —I encourage the reader to be scientific in the general sense of daily thought as well as in the specific application of social scientific method.

There are various points of access to the book depending upon the reader's needs. The first chapter, "Thinking Scientifically," sets social science in the general context of the various ways people try to answer questions about the world around them. Chapter Two, "The Elements of Science," develops the basic outline of the scientific method by discussing concepts, variables, measurements, and hypotheses. For those faced with the immediate task of doing or understanding research, Chapter Three, entitled "Strategies," may be a good point of entry since it deals more directly with the nuts and bolts of scientific inquiry. Chapter Four, "Refinements," presumes a basic understanding of the scientific method and supplies a more extensive repertory of tools for research. The final chapter, "Reflections: Back to the Roots," should be read, I think, by those who use the book for whatever purpose. The point of the concluding chapter is to place scientific understanding in perspective and to suggest generally where humility is necessary and achievement possible.

For convenience of access and review, each chapter begins with an outline of the topics covered and ends with the major concepts introduced listed in the general order of their appearance.

In the Appendix, an article by Professor Lewis Lipsitz of the University of North Carolina, "Work Life and Political Attitudes," is reprinted. The article is cited fre-

quently in the text. Those who wish to have a good model for the design and discussion of a research project may want to consider it carefully. I appreciate the permission of the *American Political Science Review* and Professor Lipsitz to reprint the article, which originally appeared in the *APSR* 58 (December 1964): 951–962. My thanks also for permission to use the cartoon by "Lorenz" that appeared in the December 9, 1974, issue of *The New Yorker*, and to Newsweek, Inc. and Simon and Schuster, Inc., for permission to reprint Table 4.1 in Chapter Four.

A liberal arts college can be a good place to write a book like this; there is an easily accessible community of scholars in the various disciplines of social science. My list of acknowledgments thus includes some especially helpful colleagues. Bob Blair was a good friend and trusty resource throughout the project. Philip Zweifel's scrutiny of the manuscript rescued the syntax in places, Gene Pollock helped illuminate a few statistical mysteries, Frank Miller and Steve Victor aided in making substantive some random ruminations. In addition to Frank Miller, Bradlee Karan and Gordon Shull contributed suggestions to an earlier form of the first two chapters written with the support of an NSF-COSIP grant to the Department of Political Science. My Senior Thesis students and those in American Politics and Empirical Theory were valued, though unwitting, accomplices in refining these ideas, as were the participants in the Social Science Roundtable. The College of Wooster leave program and Faculty Development Fund supplied essential support for which I am grateful.

Aage Clausen of Ohio State University did a particularly thoughtful and meticulous critique of the manuscript. Working with Barry Rossinoff, Executive Editor for St. Martin's Press, was a pleasure. I appreciate very much

his confidence in this effort and the guidance of the anonymous critics he selected.

To all of these I am indebted, as are the readers of this book, though neither they nor I may hold them responsible for the result.

Judy Hoover contributed some helpful suggestions in the writing, and a lot more that this husband couldn't begin to acknowledge. Andrew and Erin appear briefly in the second chapter and are present throughout in the nurture of the spirit they provide to their father.

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OUTLINE

THINKING SCIENTIFICALLY

"Science searches the common experience of people; and it is made by people, and it has their style."

JACOB BRONOWSKI

"Social science" in cold print gives rise to images of some robot in a statistics laboratory reducing human activity to bloodless digits and simplified formulas. Research reports filled with mechanical-sounding words like "empirical," "quantitative," "operational," "inverse," and "cor-

relative" aren't very poetic. Yet the stereotypes of social science created by these images are, I will try to show, wrong.

Like any other mode of knowing, social science can be used for perverse ends; however, it can also be used for humane personal understanding. By testing thoughts against reality, science helps to liberate inquiry from bias, prejudice, and just plain muddleheadedness. So it is unwise to be put off by simple stereotypes—too many people accept these stereotypes and deny to themselves the power of social scientific understanding.

The word "science" stands for a very great deal in our culture—some even consider it the successor to religion in the modern age. Our object here is to find a path into the scientific mode of inquiry, not to examine the whole range of issues associated with science. In order to find that path, we will begin not by defining science, but rather by allowing science to emerge out of contrasts with other forms of knowledge.

First, we have to identify some distractions that should be ignored. Science is sometimes confused with technology, which is the application of science to various tasks. Grade school texts that caption pictures of rockets on the moon with the title, "Science Marches On!" aid such confusion. The technology that makes landings on the moon possible emerged from the use of scientific strategies in the study of propulsion, electronics, and numerous other fields. It is the mode of inquiry that is scientific; the rocket is a piece of technology.

Just as science is not technology, neither is it some specific body of knowledge. The popular phrase "*Science tells us* [for example] that smoking is bad for your health" really misleads. "Science" doesn't tell us anything; people

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tell us things, in this case people who have used scientific strategies to investigate the relationship of smoking to health. Science, as a way of thought and investigation, is best conceived of as existing not in books, or in machinery, or in reports containing numbers, but rather in that invisible world of the mind. Science has to do with the way questions are formulated and answered; science is a set of rules and forms for inquiry created by people who want reliable answers.

Another distraction comes from identifying particular persons as "scientists." That usage is not erroneous, since presumably the people so labeled are committed to the scientific form of inquiry, but neither is it fully honest to say that some people are scientists, whereas others are presumably nonscientists. Science is a mode of inquiry that, we will see shortly, is common to all human beings. Some people specialize in scientific approaches to knowledge, but we are all participants in the scientific way of thinking.

In becoming more self-conscious of your own habits of thought, you will find that there is some science in all of us. We measure, compare, modify beliefs, and acquire a kind of savvy about evidence in the daily business of figuring out what to do next and how to relate to others. The simplest of games involves the testing of tactics and strategies against the data of performance, and that is crudely scientific. Even trying out different styles of dress for their impact on others has an element of science in it.

The scientific way of thought is one of a number of strategies by which we try to cope with a vital reality: the uncertainty of life. We don't know what the consequences of many of our actions will be. We may have little idea of the forces that affect us subtly or directly, gradually

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or suddenly. In trying to accomplish even the simplest task, like figuring out what to eat, we do elementary calculations of what might taste good or what might be good for us. If there's enough uncertainty on that score, a little advance testing is a good idea: the king has his taster, and the rest of us, at least when it comes to a certain hamburger, have the assurance that billions have already been sold.

The scientific approach has many competitors in the search for understanding. For many people during most of history, the competition has prevailed. Analysis of reality has usually been much less popular than myths, superstitions, and hunches, which have the reassuring feel of certainty *before* the event they try to predict or control, though seldom afterwards. People starve every day because of their refusal to eat good food that is believed to be sacred or thought to be polluting. Personal beliefs do have their place. Sometimes unverified belief sponsors an inspired action or sustains the doubtful to a better day. The point merely is that the refusal to analyze is crippling, and the skilled analyst is in a position of strength.

Why Bother to Be Systematic?

Most human communication takes place among small groups of persons who share a common language and much common experience and understanding of the world they live in. There is a ready-made arena for mutual agreement or argument. Not so in a more complex social environment. Though families can transmit wisdom across generations by handing down stories and maxims,

societies run into trouble. In its most cynical form, the question is, "Whose myth is to be believed?" The necessities of communication, let alone the need for personal understanding of the environment, generate a need for systematic thought and inquiry. Because society is interesting for the drama it contains, there is a tendency to dispense with systematic understanding and get on with the descriptions, stories, and personal judgments. These can be illuminating, though they often have limited usefulness because highly subjective accounts of life form a poor basis for the formation of common understanding and common action.

The intricate task of getting people to bridge the differences that arise from the particularity of their experience requires a more disciplined approach to knowledge. *Knowledge is socially powerful only if it is knowledge that can be put to use.* Social knowledge, if it is to be useful, must be both *transmissible* and *valid*. In order to be transmissible, knowledge must be in clear form. And if the knowledge is intended to be used as a spur to action, it must be convincing enough to create an impulse to action in the audience. A statement such as, "I think that capitalism exploits the poor," may influence one's friends and even relatives to think that there is some injustice in our society. But it probably won't make any waves with others. If, however, you can cite the evidence that, "In our capitalistic system, 10 percent of the people control 50 percent of the wealth, and 50 percent of the people control less than 10 percent of the wealth," a more compelling argument results because you relate a judgment to a measurement of reality. People who don't even like you, but who favor some kind of fairness in wealth distribution, might find such a statement a powerful cue

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