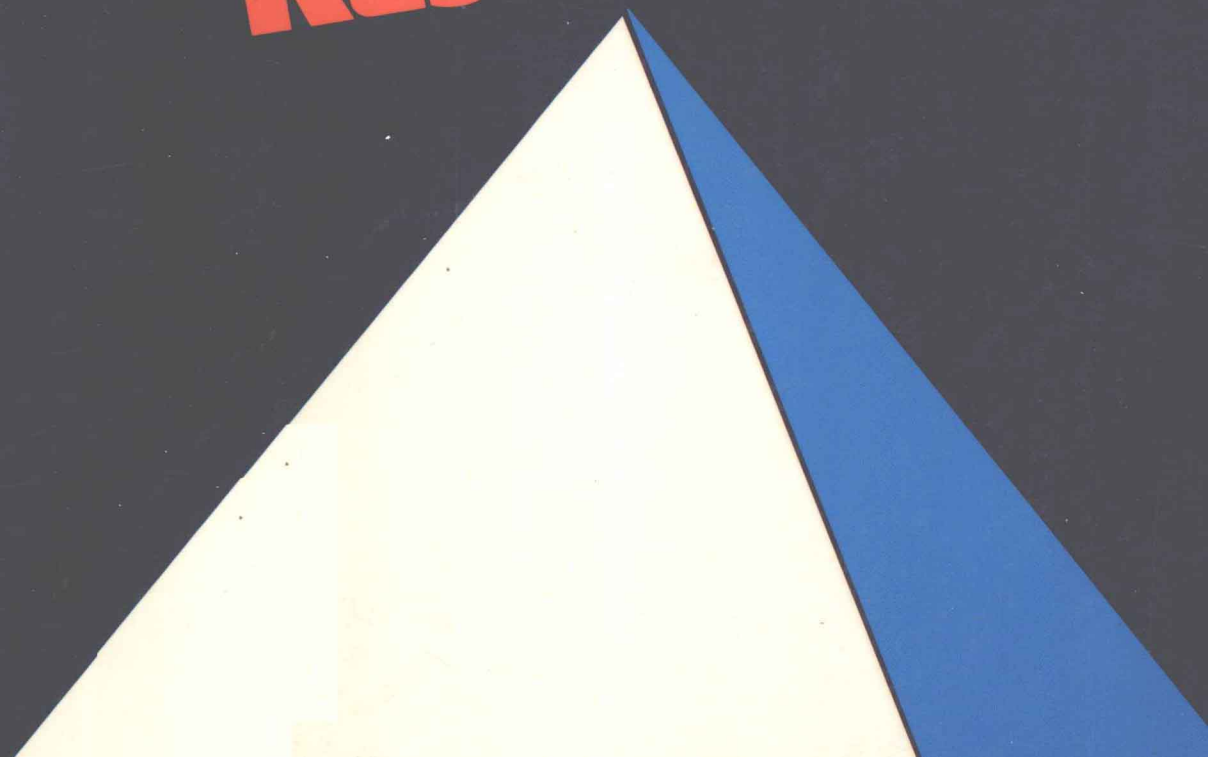
Paul C. Stern

EVALUATING SOCIAL SCIENCE RESEARCH



Evaluating Social Science Research

Paul C. Stern
Institution for Social and Policy Studies
Yale University

New York Oxford
OXFORD UNIVERSITY PRESS
1979

Library of Congress Cataloging in Publication Data

Stern, Paul C 1944–
Evaluating social science research.

Bibliography: p.
Includes index.
1. Social science research. 2. Social sciences—
Methodology. I. Title.
H62.S7545 300'.7'2 78-16235 ISBN 0-19-502480-X

Printed in the United States of America
20 19 18 17 16 15 14 13

Preface

THIS BOOK is the result of a concern shared by several people who have been on the psychology faculty at Elmira College. We felt that our students were insufficiently prepared to devise research or even, in many cases, to read critically in the professional journals. We decided to design a course explicitly for training students in the skills of critically evaluating empirical research. First entitled "Advanced General Psychology," the course was used as a prerequisite for Experimental Psychology and other upper level courses. As interest in the course spread to faculty and students outside psychology, the course broadened into "Evaluating Social Science Research."

This course has been useful to students in several disciplines because its primary focus is on the development of cognitive skills that are appropriate for analyzing any empirical research. These skills, combined with some knowledge of the relevant content areas, give students a good background for critical reading of empirical research in a number of fields.

In the course and in this book, the emphasis is on evaluation of research instead of acquisition of a new methodological vocabulary. Although terms common in methodology textbooks are used, the main interest is in getting students to apply the concepts; I am less concerned about whether they learn to define the terms. This emphasis is reflected in heavy reliance on exercises and problems—students develop critical capacities by practicing them and by getting feedback on their progress.

This book was developed for a particular twelve-week course, yet the rationale

behind it is equally valid in other educational contexts. Most likely, it will be used by instructors who, like myself, find themselves teaching research methods to students who do not yet know how to review a body of empirical literature. For such instructors, it will supplement books that emphasize conducting research, handling statistics, and writing research reports, but do not deal with the first step in the research process: the evaluation of existing knowledge about a possible research question.

My hope is that the book will also be used outside of curricula aimed at training people to do competent empirical research. Most undergraduate students will never conduct empirical research, yet the skills taught here are valuable for them too. In fact, the most gratifying outcomes of teaching "Evaluating Social Science Research" are the changes in students who have seen the value of their critical skills in their nonacademic lives. These students report that they now question the poorly supported claims of "experts" whose word they once would have taken on faith. Some put it more strongly: They feel an increased sense of personal control and power because they are able to make important judgments for themselves and need not be dependent on what they hear or read in the popular media. Such reports point to the greatest value of explicit training in critical thinking skills, and they confirm that—at least sometimes—material that has a place in a curriculum can also help people to gain an education.

This work is the result of my interaction with students over a period of five years, and it has benefited greatly from constant revision. But the book owes its very existence to a person I have never met. Dr. James E. Bell preceded me at Elmira College and left behind the idea of teaching a course such as the one eventually created. He also left behind some of his teaching materials. I owe to him the concept of teaching critical thinking through examples and problems, and also some of the terminology used, especially in the first chapter. Dr. Bell continues to teach critical thinking in a more accepting educational atmosphere at Howard Community College in Maryland.

Jim Bell's ideas came to me through Dr. Richard Ek, my colleague at Elmira until 1976, who has provided continual moral and intellectual support for the preparation of these materials. His support and encouragement have been invaluable. Rick continues his educational work at Corning Community College in New York.

I also wish to thank all the students who served as Teaching Fellows over the last five years and who helped teach this material. Special thanks are due to Kathy Parsons, Jan Guild, Eileen Kirkpatrick, Jerry Bortz, Bob Dietrich, Gary Millspaugh, George Greger, Marsha Kokinda, Beth Dalton, Laurel Tormey, Linda Maceda, and Penny Chick, each of whom, in one way or another, is responsible for some of what is in this book. Comments and criticism from other Teaching Fellows and students have also been of great value.

In the typing and preparation of this volume, I have been greatly assisted by the work of Sue Stern, Kim Sykes, Phyllis Peters, Melissa Williams, Linda Maceda, and especially Chris Hummer, who has always managed to find the time to help when it was needed most. Finally, I want to thank Sue and Sarah Stern, who somehow put up with endless hours of my writing and typing in attic, basement, and elsewhere over the years, postponing other things we could have done.

New Haven P.C.S.
September 1978

Contents

Evaluating
Social Science
Research

Introduction

This book is designed to help you answer two important questions:

1. How can I find out about something I want to know more about?
2. When I do find out, how will I know what to believe?

These two questions cover a huge area of education, and you may wonder how this book can claim to do so much. My goals are actually narrower than this. The material here will be most useful if the things you want to know about have certain characteristics.

1. The focus is on questions of *fact*, rather than questions of *value*. Values are relevant to this book only when they raise questions of fact. If you want to know, for example, whether racial integration is good for children, this book will not be of any direct help. Such a value question cannot be decided until you are clear about what you mean by "good." But if you value integration, you may believe in it because it increases understanding between people. This belief raises a question of fact: Do people raised in integrated environments understand others better than comparable people raised in segregated surroundings? Whether or not they do is a factual question, and this book deals with such questions.

A question of fact is one that we try to answer by making observations with our senses and checking the accuracy of these observations against the observations of others. A fact is an observation that can be verified by others—it is a step beyond our individual feelings and impressions.

2. The focus is on questions of fact, not questions of *theory*. The process of making inferences from theory is relevant to this book because inferences from

theory raise questions of fact. For example, Marx's theory produced predictions about the transition from capitalism to socialism. To ask whether these transitions have occurred as Marx predicted is to raise a factual question, and an affirmative answer to this question would provide some evidence for Marx's theory. Similarly, Freud's theory can be made to yield predictions about what happens to people who are deprived of the opportunity to dream. For example, a person would be expected to dream more than usual after dream deprivation. Whether or not this occurs is a factual question and, again, the answer to the question is evidence for or against Freud's theory. Theories are tested by making them produce factual statements and by appealing to the evidence that would confirm or disconfirm these statements.

This book does not attempt to show you how to make predictions from theories, but it does teach you how to pass judgment on the factual accuracy of predictions. You will not learn how to derive such predictions as "Dream time increases after dream deprivation," but you will learn the skills you need to judge the truth of this statement.

3. The focus is on factual questions about people, their institutions, their interactions, and their behavior. We will also look at some questions concerning the behavior of lower animals. These questions fall within the traditional disciplines of psychology, sociology, anthropology, economics, education, political science, psychotherapy, and so on. I am focusing on these questions because the research methods used to study them are fairly similar, as are the difficulties of getting acceptable answers. Thus, what you learn about evaluating research on a problem related to education will be useful in evaluating research on a sociological problem.

4. The focus is on *evaluating* research someone else has already done. If there are no facts pertaining to your question, this book won't help much; it is not a guide for gathering actual evidence. However, if you become good at evaluating other people's research, you will have acquired a skill necessary for doing good research of your own.

With all these restrictions, many different kinds of questions still "qualify." Here are some examples:

> Are women more conforming than men?
> Is there really a "Catholic vote" in presidential elections?
> Can a teacher's expectation influence a pupil's IQ?
> Do anti-abortion laws increase the birth rate?
> Does marijuana use impair memory?
> What is the effect of a ½% increase in the prime interest rate on the money supply?
> Is it true that schools inculcate "middle-class values?"
> Is schizophrenia an inherited disease?

Are sex role differentiations related to the means of subsistence of a culture?

Do people learn better when they are a little anxious?

Of course, it's impossible to "cover" all these topics in one place, and this is not my purpose. This book aims to provide the tools you need to arrive at the best possible answer to your own question of fact, whatever it is. I am assuming that you already have two things when you begin. First: *a subject area you want to find out about*. You are in good shape if you have an interest you can phrase as a question, such as, "What causes juvenile delinquency?" or "Is marijuana psychologically harmful?" If your interest cannot yet be put in question form, consult the Appendix, which is devoted to showing how to turn a general interest into a question answerable by scientific evidence. Second: *at least an elementary knowledge of the language people use in talking about your kind of question*. If you have in mind a sociological question, you should have the equivalent of a sociology course's worth of knowledge of sociological language (or else a stong determination to learn). I am not assuming prior knowledge of statistics, although such knowledge will certainly help you to understand scientific articles. The most essential statistical concepts are explained as they become necessary.

As you start to pursue your question, you will learn new and more specialized language that is meaningful to researchers working on your question. You will also gain exposure to the current theories and methods used in research about your subject. The less you know about the question you are asking, the more you should expect to learn.

In working through this book, you will be learning:

To ask questions so that they are answerable

To use library resources to find facts about your question

To use standards of evidence employed by social scientists in judging statements of fact

Although it is possible to learn each of these skills separately, it makes more sense to present them together. If you have a genuine interest in a topic or question, it will be beneficial to learn how to use library resources so that you can frame an answerable question and find the facts you need to try to answer that question.

Because this book cannot be written exclusively for your own personal interest area, you should be doing two things as you progress through it: improving the skills you need, using examples in the book for practice, and practicing your skills in your own area of interest, by reading scientific material on that subject.

The book is divided into five chapters and an Appendix:

Chapter 1: *Scientific and nonscientific statements of fact*
Chapter 2: *Methods of gathering scientific evidence*

Chapter 3: *Evaluating scientific evidence: I*
Chapter 4: *Evaluating scientific evidence: II*
Chapter 5: *Reviewing a body of literature*
Appendix: *Asking answerable questions*

The chapters are presented in a logical order, with the material in each building on what was presented earlier. The Appendix is intended as a reference whenever you begin to search for bibliography and can, therefore, be used at various points in the chapter sequence. The language in the Appendix assumes mastery of the first two chapters.

Each chapter is devoted to a limited number of related skills. The student's goal is not to memorize terms and definitions, but to learn to *use concepts* when evaluating scientific writing. Exercises and problems are included to allow the student to practice until the skills are well established, and additional problems may be used for further practice. When you finish the book, you should be able to define a question and find and critically evaluate the available scientific evidence relevant to that question. Thus, you will be better able to know what to believe.

CHAPTER I

Scientific and Nonscientific Statements of Fact

Any statement that you can try to confirm or disconfirm by looking at the evidence of the senses (or sensing technology) is a statement of fact. This includes statements that are true, those that are false, and statements about which truth or falsity is undetermined. Thus, both the statement "Smoking causes cancer" and the statement "Smoking is unrelated to cancer" are statements of fact by this definition. Whatever one believes about the truth or falsity of these statements, we can agree that the way to confirm or disconfirm them is by appeal to the senses of doctors (who can, with the help of technology, diagnose cancer), and to the senses of anyone at all, who can determine whether someone is a smoker. Although there may be some disagreement about the relationship between smoking and cancer, and while at least one of the statements must be false, both statements are factual in the present sense.

Some statements are not factual in this sense. Consider the statement "Socialism is the best form of government." This is a value statement because of the judgment given by the use of "best." You wouldn't try to confirm or disconfirm it until you knew what its author meant by "best." Thus, before trying to confirm or disconfirm, you would appeal to the author for a definition. Note that definitions are *not* statements of fact. Suppose the author of the statement about socialism said, "By 'best,' I mean 'provides the highest possible standard of living'." This is the author's definition, and you wouldn't try to confirm or disconfirm it at all. (You could, of course, agree or disagree with it.) If you combine the value statement about socialism and the definition that is given to the value word

"best," you now have a factual statement: "Socialism gives its people a higher standard of living than any other form of government." This statement is factual in that you would look for evidence to confirm or disconfirm it. It may not be possible to find the evidence that would lead to a clear-cut confirmation or disconfirmation, but this does not change the way you would go about confirming or disconfirming.

Some statements in theoretical discussions are also not factual statements. These include statements that relate parts of a theory to each other, such as "A neurotic symptom both conceals and expresses a repressed wish." While such a statement seems to refer to something in the world, we do not know where or how to look for confirmation until we know more about what the author means by "neurotic symptom," "conceals," "expresses," and "repressed wish." If the abstractions contained in the statement are related to actual people and events so that we know what exactly the author is referring to, the statement can be turned into a statement of fact.

In short, the distinction between statements of fact and other statements is in the way you go about confirming them (and whether you even try to confirm them; you don't, with definitions). If you want to make observations to answer a question, it is probably factual. If it seems that no amount of evidence would matter, it is nonfactual.

The main point of this chapter is to make clear the minimum requirements for scientific statements. A discussion of statements of fact will make these requirements stand out. Here are some interesting statements of fact:

> "Properly spaced children from small families are brighter."
>
> "In a normal two-person conversation more than 65 percent of the social meaning is carried by nonverbal messages."
>
> "Today the war of national liberation . . . has become a favorable breeding-ground for mental disorders."
>
> "A child learns its native language by patient and persistent experiment."
>
> "In large cities, crime rates are higher in disadvantaged Negro areas than anywhere else."

These statements are taken from books and periodicals that attempt to give authoritative information. But are these statements believable? As they stand, none is supported by any evidence. That is, the authors have not, as far as we know now, presented any firsthand knowledge of what they are talking about. They are making assertions of fact, but they have not (yet) reported any personal experience, observations, or data to support their assertions. Such bare statements of fact, with no supporting evidence, are called *unsupported assertions*.[1]

1. The term "unsupported assertion," and many ideas throughout this book, are owed either directly or indirectly to Dr. James F. Bell (Bell, no date). Citations of references in this book use the style of the American Psychological Association: articles are cited by author and date, and the references will

Unsupported assertions are commonly found in such popular sources as television ads: "Bufferin enters the bloodstream twice as fast as aspirin," political speeches: "American military strength is second to none," and magazines, especially of the sensational type: "New sex therapy saves thousands of marriages." My reaction to such statements is always: sounds interesting, but is there any evidence? In the case of TV ads, enough people share my reaction that many ads have been compelled to cite their evidence: "According to EPA tests, Chevette delivers 40 miles per gallon on the highway, 24 in the city," or whatever. We expect any reputable source to cite the evidence for its statements of fact.

All the statements of fact quoted at the beginning of this section are supported by something more than just words. We are right to call them all unsupported assertions as they stand, but let us also see what kind of support the authors offer for their statements.

The statement about small families being brighter comes from the publication *Intercom* (Small Families are Smarter, 1976), which says it is based on "an intriguingly simple theory posed by Psychologist Robert Zajonc of the University of Michigan." So, small families have brighter children because Zajonc's theory says so. If you can trust Zajonc, or if you believe in the reputations of psychologists at the University of Michigan, you can believe that small families have brighter children. *Intercom* seems to be *appealing to authority*. A statement is supported by appeal to authority if the best evidence offered is that someone else (besides the author) says it is so. The problem with appeals to authority is that there is no factual support for the authority's statement of fact. In a sense, the author has appealed to someone's unsupported assertion. You may say that a psychologist at the University of Michigan wouldn't make an unsupported assertion, but it is not safe to take anyone's statements on faith. Certainly another psychologist would not accept Zajonc's statement without supporting evidence, even though he is respected in the field.

The statement about nonverbal communication also turns out to be an appeal to authority. The statement comes from a book by David W. Johnson (1973), and is supported by a reference to another source (McCroskey, Larson, & Knapp, 1971). Because we have no idea whether McCroskey et al. have factual evidence to support their statement, we have to conclude that Johnson is making his statement merely on the other writers' authority. If we are unsatisfied with this as evidence, as we should be, we must go to the McCroskey book to see if their statement is supported by evidence.

We can distinguish *appeal to authority* from mere *unsupported assertion* by the fact that in an appeal to authority someone besides the author believes the statement.

---

be found, alphabetically by author, at the end of the book. My style of citing sources may serve as a model for students in disciplines commonly using this style (e.g., psychology, education, speech and hearing). Students in other disciplines may consult their respective professional journals for stylistic models.