Miriam Lewin

UNDERSTANDING PSYCHOLOGICAL RESEARCH

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THE STUDENT RESEARCHER'S HANDBOOK

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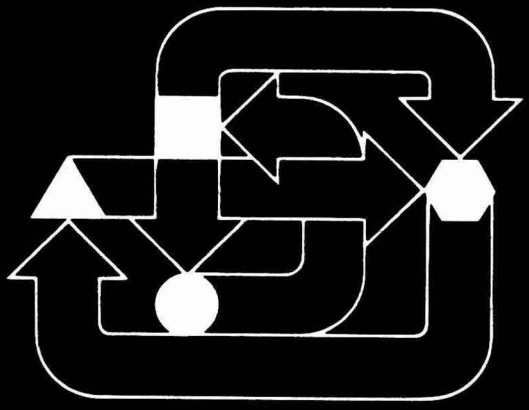

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To G. who inspired this book

PREFACE

Paradoxically, although many students and faculty are attracted to psychology because of their interest in the "soft" areas, such as social or developmental psychology, research methods textbooks traditionally emphasize "hard" areas, such as animal learning. *Understanding Psychological Research* fills the need for a book that teaches students about all aspects of research design by using examples drawn from developmental, social, and personality psychology.

The book's second objective is to assist beginners who are conducting their first original projects. Novices need a guidebook that explains clearly and exactly how to carry out each step in the research process—a handbook that leads beginners from the initial formulation of a researchable topic, through the myriad pitfalls of data collection and analysis, to the writing of concise, informative research reports.

Third, the book introduces students to the aspects of design and the methods that will be of increasing importance in the future, such as causal analysis, field research, and process, outcome, and evaluation research.

In sum, this book is flexibly devised so that it may be used:

- To teach the fundamentals of research design in a course such as Experimental Psychology or Research Methods.
- As a text for courses such as Methods in Social Psychology, Methods in Personality Research, or Developmental Methods.
- To guide students who are doing their own research projects, senior theses, junior honors projects, and independent studies.

Throughout the book classic and recent research studies are described in sufficient detail so that the logic of the research design and the method is clear. The method of content analysis, for example, is illustrated by descriptions of research on suicide notes, Protestant sermons, sex roles in children's school readers, ancient Roman tombstones, moral development, the needs for achievement and for power, and the fear of success motive. Coding systems developed by Kohlberg, McClelland, Winter, and Horner are reproduced in full or in part so that students can see what they are like, can use them in their own projects, or can use them as models for designing new scoring systems. Several simple student-designed systems are also illustrated. Personality researchers' use of content analysis to study projective test responses and social psychologists' use of archival data to test hypotheses about the political stability of nations are shown. The uses of laboratory and field experiments, interviews, methods of structured or naturalistic observation, and paper and pencil measures are similarly illustrated.

In selecting topics I was guided by two further objectives. First, the book should be understandable to beginners. Each section was tested in classes and rewritten until the language was clear to students who had little background in psychology. The second objective—which may seem to contradict the first—was to write a fairly sophisticated book that would introduce undergraduates

to some of the complexities of research, to concepts such as "regression to the mean" or "Aristotelian and Galilean approaches to science." These two objectives are reconciled by explaining difficult concepts in accurate but simple and direct vocabulary and by grouping the advanced topics together within chapters, in sections that may be omitted for the brief course.

The first three chapters discuss the philosophy of science, the APA "ten commandments" for ethical research, and research design. In addition to the traditional topics, there is discussion of quasi-experimental designs, single-case design ("where $N = 1$"), inductive research, cohort effects, time-lag designs, the regression effect, cross-lag analysis, and Blalock's causal analysis. Examples of undergraduate research show students how to move from a vague idea to a researchable design on the introductory level. Chapter 4 explores additional concepts in research design by a detailed examination of four experiments. The limitations of bivalent research design are illustrated visually. The limitations of generalization if the "wrong" variables are held constant or if a critical dependent variable is not measured are made clear.

In Chapter 5 students are introduced to all phases of questionnaire construction: how to introduce a questionnaire, how to write effective items in a variety of styles and formats, how to gain the subject's cooperation, and how to administer questionnaires. Chapter 6 describes nine external prediction and five representational attitude scales. To facilitate student research, the Rotter Internal-External Control scale, the Bem Androgyny scale, and (in Chapter 8) the California F scale are reprinted in full with scoring instructions. Chapter 7 explains when a true representative sample is necessary and under what conditions it is less essential. It includes a careful exposition of the concepts of confidence interval and confidence level. Three tables show the relationship between confidence intervals and the size of the sample required for the study. Students are taught how to draw a probability sample. Social indicator research and epidemeological studies of child mental health illustrate the uses of samples and the concepts of prevalence, incidence, and concordance rate. Chapter 8 is organized around five critical issues in personality research. Empirically derived, theory-based, and projective tests are compared. The student learns why a test valid for one purpose (say as research) may not be valid for another purpose (such as personnel selection). In Chapter 9 students learn how to write both highly structured and less structured interview schedules, how to gain the cooperation of respondents, how to conduct interviews, and how to record interview data. Illustrative examples include work on temperament (Thomas, Chess, and Birch), cognitive development in college students (Perry), and phenomenological analysis of learning (Giorgi). Chapter 10 describes nonreactive methods in addition to content analysis. Chapter 11 explains two topics of increasing methodological importance. Process research is compared to outcome research, and theory generating research is compared to theory testing research. Structured observation is illustrated by Piagetian studies, motor de-

velopment studies (Bayley), the conditional probability matrix studies, and others. Participant or naturalistic observation is treated at unusual length; topics such as entry, time sampling, event sampling, and validity are included. They are illustrated by research on mental hospitals, child rearing, and inner-city schools.

This book is the first undergraduate textbook to include a chapter on evaluation research, which is expected to be a most important area in the future. Chapter 12 defines the principles of action research and illustrates process and outcome research in the evaluation area.

Chapters 13 and 14 are carefully designed to bridge the chasm between the statistics course (a desirable prerequisite) and the use of statistics in actual research by novices. In Chapter 13, students are guided through the preliminary steps in data analysis, generously illustrated with examples, tables, and charts. How to handle raw data, frequency distributions, how to combine catagories, when to group data, cross tabulation, and when to use (and how to compute) percentages, the mean, the median, and the mode are discussed. Chapter 14 first directs students to consider three types of statistical questions and three types of data. Students must decide which type of data they have and which statistical question they must answer. After reaching a decision, they consult the Statistical Test Selection Guide, which helps them determine which of several widely used parametric or nonparametric statistics are appropriate for their research problem. Brief illustrations of the types of problems suitable for analysis by seven statistical tests follow the guide. Students are urged to compare their problem with those illustrated as a check on the accuracy of their choice. Next, students compute the statistic they need by turning to the appropriate instructions, which include a flowchart, a worked example, and selected critical values for determining the significance of the figure they compute. Chapter 14 greatly increases the likelihood that students will correctly compute and interpret the right statistic and supports the professor's efforts to this end in the classroom. The chapter also includes some handy aides to simplify statistical work: a table from which you can read off confidence intervals for percentages, and the Lawshe-Baker nomograph, from which you can directly read the significance of the difference between two percentages.

Chapter 15 is an innovation in methodology texts. It explores six controvertial aspects of *data interpretation*, using studies of obedience (Milgram), school achievement (Coleman), traffic law crackdowns (Campbell and Ross), the I.Q., sex role learning, and "the great S.A.T. mystery: why have S.A.T. scores declined?" These and other studies illustrate the meaning of concepts such as "variance accounted for," "relative rank order," "correlation is not always causation," "hereditability," and "within-group and between-group differences." The gap sometimes found between operational definitions and their implicit conceptual definitions, and the potentially grave consequences of measurement error, are also demonstrated. Students see how the concepts previously developed throughout the book are used to challenge and defend

research conclusions. They come to understand why results are rarely cut and dried—why competent professionals can disagree on the meaning of research findings.

In Chapter 16, students learn to write a research report in correct APA style; the chapter stresses what to include, how to present inductive (as well as deductive) results, questionnaire results, negative results, or secondary findings, and how to prepare an informative table. Undergraduate student paper conferences, at which student research may be presented, are listed.

The appendix includes an annoted bibliography of 16 reference books that describe psychological scales. In some references the scales are reproduced in full. By ordering for the library from this list the instructor can insure that students have access to an ample supply of psychological measures.

I would like to express my appreciation to the following persons who gave generously of their time and advice: John Broughton, Jack Burton, Donna Cayot, Sr. Mary Clark, Richard Christie, Phoebe C. Ellsworth, William Kessen, Frank Kohout, Daniel J. Levinson, Brenden Maher, Thomas Pettigrew, Herbert Robbins, Leonard Sayles, Jerome Singer, Henry Solomon, Eric Valentine, Ladd Wheeler, and Robert Zajonc.

Miriam Lewin

HOW TO USE THIS TEXT

Depending on the objectives of the instructor, the book can be used in several ways.

1. The core chapters for a *research methods or experimental psychology course* in which students are *not* doing their own research projects are Chapters 2 and 3 (research design); Chapter 4 (experiments and research design); Chapter 7 (sampling); Chapter 11 (process and outcome research, theory generating research); and Chapter 15 (data interpretation). Chapter 1 (philosophy of science and the ethics of research) would be valuable. As many additional chapters on specific methods as time permits may be added.

2. The core chapters for a course in which students do their own research are Chapter 1 (the summary of ethical principles only); Chapters 2 and 3 (research design); those methods chapters that suit the research project; Chapter 7 (sampling); Chapters 13 and 14 (data analysis); and Chapter 16 (writing the report). Unless a review of selected statistics is desired, all of Chapter 14 need not be assigned. Students can determine what statistics they need and read accordingly.

3. For a research methods course in the social, personality, or developmental area the core chapters are Chapters 1 to 3; the methods material (Chapters 4 to 11) that is of greatest interest; Chapter 12 (evaluation research); and Chapter 15 (data interpretation). If the students have already completed a first research design course, it may be possible to omit part or all of the first three chapters.

4. For the brief course (or for students with less background in psychology) the core assignments are Chapter 1 (the summary of ethical principles only); Chapter 2 (the first sections, up to factorial designs); Chapter 3 (but omit the section on types of validity and causal inference); and Chapter 5 (questionnaire construction), or select other methods chapters as desired. If needed, include Chapter 7 (sampling), but omit the section on confidence intervals. If students have data to analyze, include Chapter 13 (data analysis) and Chapter 16 (writing the report). These core chapters can be supplemented by additional chapters.

M. L.

CONTENTS

PART
ONE

THE LOGIC OF RESEARCH

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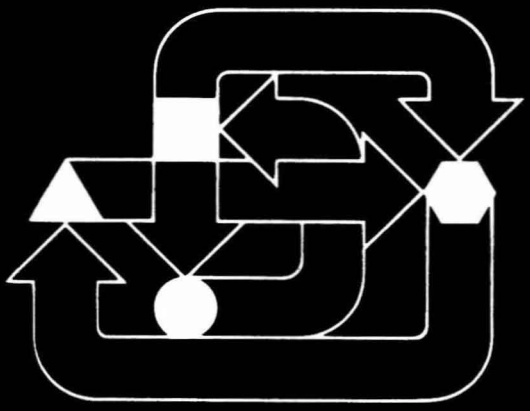


CHAPTER ONE
THE SCIENTIFIC AND ETHICAL FOUNDATIONS OF RESEARCH

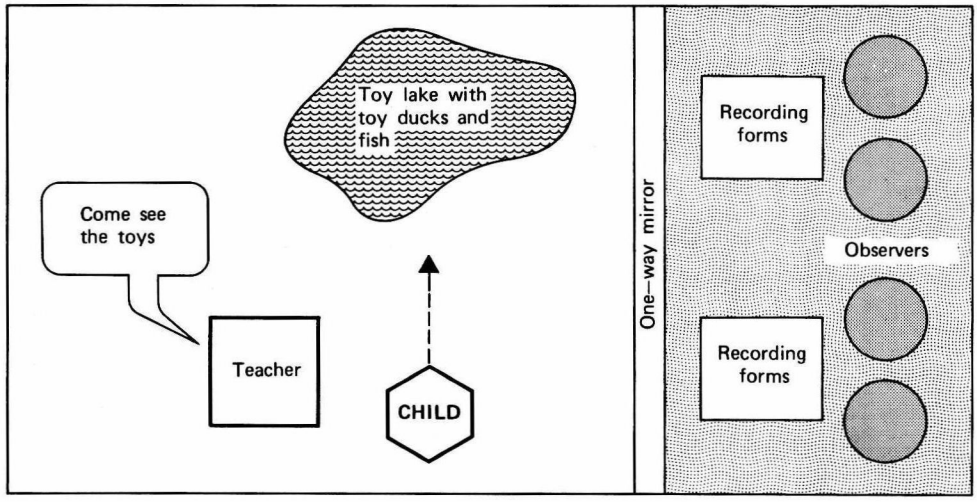
1. The grapefruit juice was as watery as always. Now back to the day room. Four hours and seventeen minutes until lunch. Shrieks of canned laughter from the game show on the television could be heard faintly echoing down the corridor as Kate Garfinkel approached the day room. Well, maybe this would be a good time to try to speak to Dr. Heldman, who was visible in the distance, striding briskly down the corridor.

"Excuse me, Dr. Heldman, but could you please tell me when I could be reviewed for discharge?"

"Hi, Kate, how's it going? Looks like snow, doesn't it?"

Without breaking stride, Dr. Heldman proceeds down the hall. Kate sighs. The lot of the participant observer is not always an easy one. Kate takes a notepad and begins to record the time, date, place, and content of her conversation with Dr. Heldman.

2. The little girl walks into the laboratory room holding her teacher's hand. Slowly a delighted smile blossoms on her face. Her attention is fixed on a toy lake containing water, a rim of sand "beaches," toy fish, and toy ducks floating on the water. As she moves toward the lake, the experimenter says, "Come and see the toys." From the adjacent room, four colleagues of the experimenter are busily observing the child's behavior through a long, one-way vision mirror, ready to record what she does during the next half hour. One pair of observers has one set of recording forms poised before them, the other pair a different set.



3. Two men are seated in comfortable overstuffed chairs in a small but pleasant book-lined office down a short hall from a door marked, "Bureau of Study Counsel." The older man says, "So you don't feel that course quite lived up to your hopes."

"No, it really didn't," says the younger man. "It doesn't make sense. Why do they play games with us? Professor Scott is giving us baloney—beautiful baloney, elegant baloney. It's a pleasure to listen to him, but it is still all baloney or else maybe mashed potatoes. You can poke it and squeeze it and you'll never find anything solid there. And my section leader, Ms. Worth, is just as bad. She gave my roommate an A-minus

on his essay, which I know for a fact he wrote on Thursday night straight out of his head after doing one run through the reading, while I really looked up every fact and I can support every statement in my essay from one of our ah—authors—and I don't, I really don't see that I should have gotton a C, for God's sake, a C. It was easily worth twice as much as his—not that I care about the damn grade so much, but it doesn't make sense, do you see what I mean? If only I could figure it out, I wouldn't mind so much. . . ."

4. Six people are sitting around a conference table. Outside the window is a spectacular view of America's capital, including the Washington Monument in the distance, but the six are totally absorbed in heatedly shuffling through stacks of memos and arguing with one another.

Dr. William Brady: "O.K., we've got to cut. What are we going to cut? Come on now."

Dr. Marion Delaney: "Drop Quick Start and push Vocational Re-Ed. We've got 13 studies here that show Quick Start isn't working."

Dr. Leroy Jones: "They don't show that, Marion, they show an I.Q. rise of 9 points, of 7 points, and Smith in Indiana even gets 14 points."

Dr. Delaney: "I know that, Leroy, but it doesn't hold up. The kids all start to slide back by second grade and the gains have vanished completely by the sixth grade."

Mr. Ralph Cohen: "But Marion, why even talk about I.Q.? I.Q. isn't *supposed* to change. The Quick Start kids are learning to trust people, to work together, they are learning to behave in a classroom. That's what's important."

Dr. Delaney: "How do we know that's what they are learning, and how do we know it's the important thing to learn?"

You have just taken a peek at three research studies and one set of research users. Kate Garfinkel is doing participant observation in a psychiatric hospital, in a study of staff reactions to psychiatric patients. (The study is described in Chapter 11, Observation.) The second vignette describes the beginning of a laboratory experiment on the effect of frustration on the constructiveness of children's play (an experiment discussed in Chapter 4, The Experiment). The unhappy college freshman is participating in a study of the stages of intellectual growth in college students (a study using the interview method and described in Chapter 9, The Interview). The last episode involves consumers of psychological research, in this case members of the staff of the United States Department of Health, Education, and Welfare, who are trying to make sensible decisions based on the results of psychological research. (The evaluation of programs such as Quick Start is discussed in Chapter 12, Evaluation Research.)

It is hoped that you are asking yourself questions about all of these episodes. What will be done with the participant observor's notes? With the college student's interview record? How can the constructiveness of a child's play be measured? How much can the psychologist frustrate the little girl without being unethical? How can we determine if research results are reliable (consistent and repeatable) and valid? How applicable will the results of these

studies be to people other than the subjects who took part in the research? How can psychological research be helpful in making social policy decisions?

In this book, we will examine how psychologists decide to study a topic, how they select one research design rather than another, choose their research methods, find or create recording, measuring, and counting devices, and draw conclusions.

The first goal of this book is to give you a good introduction to the principles of scientific research design and to the research methods commonly used in the areas of child development, personality, and social psychology.

The second goal of the book is to assist the student, especially the undergraduate, who is doing his or her own research project. A great many undergraduates today are conducting their own research projects as a class assignment, as an independent project, or as a junior or senior thesis. They quickly find that reading about research methods is one thing, but facing the problems first hand, is quite another matter. Therefore, this book will combine theoretical discussion of "why we do it this way" with concrete advice on "how to do it."

Another goal of this book is to teach you to evaluate research and the use of psychological measures, so that you may be an informed "consumer" of psychological research. As a citizen, you should have the knowledge to defend your legitimate interests when they are affected, as they will be, by decisions based on psychological research. In your job, you may be asked to take or give psychological tests. Your child's schooling may be determined in part by psychological assessments. As a citizen you may be asked to support or reject social policies at least partially based on evidence (or alleged evidence) drawn from psychological research. You need to be able to evaluate the merits of such research.

Chapter 1 discusses:

1. Why psychology has found it so hard to become a true science, a struggle which is not yet ended.
2. Some ingredients of the scientific attitude and the Aristotelian and Galilean approaches to science.
3. The situation of the student who is about to do a research project.
4. The ethics of psychological research.

PSYCHOLOGY'S STRUGGLE TO BECOME A SCIENCE

The scientific method is one of the crowning achievements of modern Western secular civilization, not withstanding the fact that scientific power can be utilized for destruction as well as good. The knowledge gained by scientific understanding is fascinating in its own right, whether or not it has any appli-

cation to life's problems. Given the advances in our understanding of the natural sciences, it was inevitable that people would begin to wonder if the same increase in understanding might be obtained about human beings. Could subjects such as love, hate, and war be studied scientifically? Why do some babies grow up with powerful standards of right and wrong? Why do others grow up oblivious to pangs of conscience? Why are people in different countries, of different generations, or in different walks of life attached to such different, even contradictory beliefs and values? Why do children of the same parents, reared in similar circumstances, have dramatically different personalities? No doubt you have your own list of puzzles about human behavior.

For centuries it was taken for granted that topics such as aggression, personality, or moral development properly belonged to novelists and philosophers, but not to scientists. Some people still think so. A United States senator made headlines a few years ago when he ridiculed the granting of government funds for the study of love. "I believe that 200 million Americans want to leave some things in life a mystery, and right at the top of things we don't want to know is why a man falls in love with a woman, and vice versa" (quoted in Byrne, 1976, p. 3).

Psychologists themselves have differed sharply over what could legitimately be studied in a scientific way. Since early in this century, leading psychologists have insisted at various times that *thinking, consciousness, insight,* or *goals* could not possibly be studied scientifically and that therefore no right-minded researcher would try to do so. Indeed, the entire field of social psychology was rejected by reputable psychologists as late as the 1930s. They considered groups to be an illusion. Only individuals, they said, really exist. Many psychologists have been equally doubtful about the feasibility of studying personality scientifically.

Some of the stumbling blocks which have made it difficult for the "soft" areas in psychology (such as personality and social and developmental psychology) to find acceptance are:

1. The apparent contradiction between the scientific concepts of determinism and mechanism and human characteristics such as choice, responsibility, and free will.
2. The apparently vague, ephemeral, unmeasurable nature of psychological topics.
3. The danger that bias in the researcher would distort results, an especially serious problem because of problem 2.

Mechanism and Determinism

The industrial revolution applied the laws of natural science to the creation of machinery and did so with enormous success. When people thought of science, they thought of gears, levers, and cog wheels. They took what may loosely be called a "mechanistic" view of science. One of the important char-