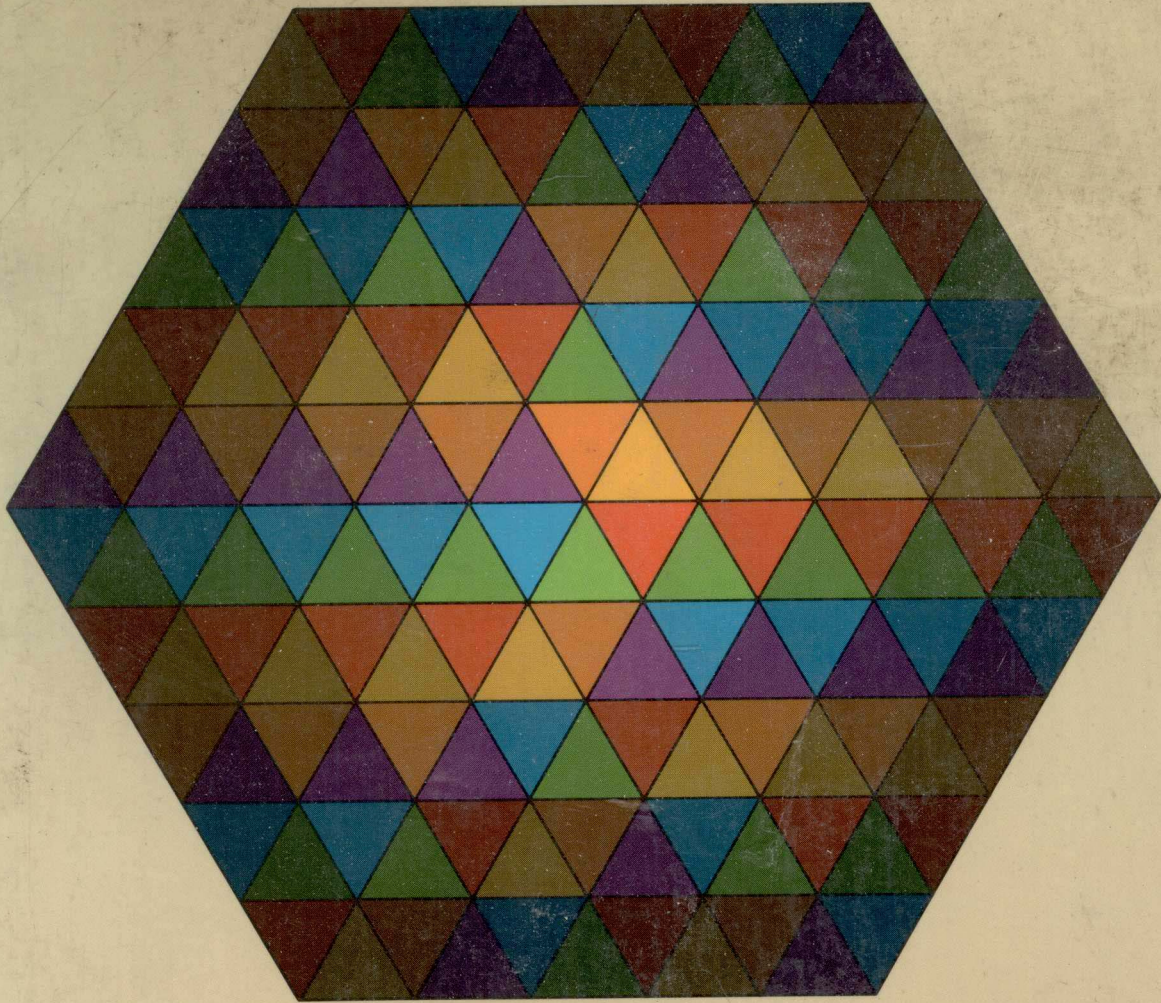


Paul D. Leedy Third Edition

Practical Research

Planning and Design



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PRACTICAL RESEARCH

Planning and Design

Third Edition

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The American University
Washington, D.C.

Macmillan Publishing Company
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PRACTICAL RESEARCH

With special appreciation

to

Two Girls

and

One Boy:

★★★

Renie

Kathy

and

Tom

About This Book (The Third Edition)

In a sense, this is a do-it-yourself, understand-it-yourself manual. It will guide you, step by step, in designing a research project, however large or small it may be. The research of most academic disciplines follows a basic methodological approach. Only the emphasis shifts. The gathering and interpreting of the data may vary from discipline to discipline, but the procedure is basically the same. Whether the research be in education, nursing, sociology, the behavioral sciences, physical education, business administration, accounting, or allied areas, a common substratum of procedure underlies the research projects in *all* of these areas. Those planning to do research in any of these areas should appreciate this basic methodological substratum and, by so doing, may then more adequately fit their particular research endeavor into the general procedural matrix. It is this overview of research methodology that this manual seeks to present. Its broad adoption in the first and second editions across academic and disciplinary boundary lines has been the best evidence for the practicability of this fundamental approach.

The practical nature of this manual has come from years of the author's teaching methodology to both graduate and undergraduate students and from observing all their doubts and uncertainties in the face of a *practical* research undertaking. Many of them knew the *theoretical* aspects of research methodology thoroughly, yet they had difficulty in the *practical* planning of a research project, in the preparing of an acceptable proposal, or in the writing of a passable research report.

The author does not undervalue the importance of a theoretical approach to the understanding of research. Many times such a background is both basic and required. But theoretical methodology does not provide of itself sufficient thrust for many students who need to get their research off the launch pad of theory into the orbit of creativity. This manual, therefore, seeks to give the student the essential theoretical orientation coupled with a *modus operandi* for the carrying out of a realistic research project.

The types of student uncertainties are many. Some students do not know precisely what research is; others are not sure where to find the information they need or, if they find it, are not sure what they should do with it after they have it. There are those who are terrified by statistics, and those who cannot get a proposal accepted or fail to secure approval for the project they have planned.

Many students have labored over a research project only to be told after all their work that "this was not quite what [the instructor] expected" or that "this is just not research." Such a reaction is frustrating, comfortless, and unrewarding.

They who apply for grants or financial assistance to carry out their research projects need to know how to propose their ideas with maximum effectiveness. The third edition has included a digest of guidelines for preparing a research proposal for grants from governmental as well as from private sources as well as a summary for the student and the experienced researcher alike, of the reasons why many proposals fail to merit approval.

One of the unique features of this book is the "Practicum in Research" section which is a part of the end matter. Here, as you pass important milestones in learning the nature of research and how to plan it in the text section of the book, you structure your *own* research project or test your understanding of the basic concepts presented in the text. Nor is the essential thrust of this text restricted to the research endeavors of the graduate or college student. A high school or college student using this book should be able to write better term papers or research reports. Similarly, a graduate student should be able to construct an acceptable proposal for a thesis or dissertation committee. Anyone using it should be able to produce a superior product in research because research is research. Only in degree of sophistication should a high school research report or a college research paper vary from a master's thesis or doctoral dissertation. Of course, in reality one knows that this is not so and that much that is misleading to the student is approved and encouraged under the

ABOUT THIS BOOK

misnomer of *research*. When one becomes aware of what is involved in applying the scientific method to the solution of research problems, then it is that the student will be led to understand that research is a basic methodology for attacking problems and the scientific method is a way of thinking that is appropriate at all levels of an individual's education.

Underlying the writing of the first edition of *Practical Research: Planning and Design* was the belief that research methodology as a basic method of investigation, under the aegis of the scientific method is *essentially* the same from one academic discipline to another. Every researcher seeking to resolve a researchable problem, every student engaged in dissertational or thesis research follows the same basic steps: the articulation of a problem, the establishment of hypotheses, the collection, the analysis and the interpretation of data, and the resolution of the effort in terms of reportable conclusions.

This belief has been eloquently affirmed in the broad adoption which *Practical Research: Planning and Design* has received. In a brief survey, done for the purpose of eliciting suggestions for the third edition from those who had adopted the text, it was found that *Practical Research: Planning and Design* had been found a suitable text in almost all academic disciplines at the graduate level for students engaged in thesis or dissertational projects.

Every effort has, therefore, been made to make this book of greatest use to students over a broad academic spectrum. Illustrations have been taken from many areas of study. There is actually very little difference between the *methodology* of research in the sciences, the behavioral sciences, and the humanities. In all these areas of learning, the object of the research effort in each discipline is *essentially* the same: to discover undiscovered truth and to extend the frontiers of knowledge in each subject area.

To this text in the third edition, several new features have been added. At the beginning of each chapter a brief overview of the chapter seeks to acquaint the reader with the content and purpose of the chapter and, thus, to make the reading more rewarding.

At the end of each chapter has been added a bibliography for further study. This bibliography is a broad spectrum selection of readings crossing the lines of many academic disciplines and seeking to provide the student with the opportunity of exploring further some of the topics discussed within the chapter.

There have been other aids included embodying the valuable suggestions and recommendations of those who have used the text and assisted in sharing their thoughts with the author at the threshold of the revision process. To all who have thus enriched this edition the author is deeply appreciative and indebted.

The author is, in fact, indebted to so many for so much in this book that he refrains from mentioning any one in particular. To his own teachers who, during his doctoral study, gave him the first insight into the need for a book such as this, he pays much respect and acknowledges himself forever in their debt. Next, he wishes to acknowledge with humility the students who, again and again, have begged him to set down for others what they have found to be most helpful in the seminar sessions they have had with him. The same encouragement has come from faculty colleagues in several universities. Those with whom he has discussed the idea and who are engaged in professional research have also encouraged setting down some of the material in permanent form. For this third edition, other colleagues from widely diversified academic disciplines in colleges and universities all across the nation who found the earlier editions adequately suited to their needs have volunteered valuable suggestions for many parts of this book. All of their critiques were most welcome and, so far as possible, they have been incorporated in this edition.

Those who thus enhanced this edition through the courtesy of their suggestions should have particular mention. Because of the broad spectrum of the academic disciplines which they represent, and the geographical spread of the institutions, their comments have been especially helpful. The author is happy to list them, along with the teaching specialties in

which they have found this text helpful: Dr. Jaclyn Card, Assistant Professor, Recreation and Park Administration, University of Missouri-Columbia; Dr. Lynne Faulk, Associate Professor, Nursing, University of South Alabama; Dr. Ruth Heidelberg, Associate Professor, Education, University of Maryland; Dr. Stephen B. Jones, Assistant Professor, Journalism, University of Colorado-Boulder; Dr. Paul R. Raffoul, Assistant Professor, Social Work, University of Houston; Dr. Anthony W. Salerno, Professor, Law and Justice, Glassboro State College; Dr. R. A. Skinner, Associate Professor, Political Science, Old Dominion University; Dr. Ronald L. Spangler, Assistant Professor, Landscape Architecture, Ball State University; Dr. Dennis G. Tesolowski, Assistant Professor, Education, Idaho State University; and Dr. Don Ethridge, Associate Professor, Agricultural Economics, Texas Technological University.

Especially is the author indebted to those colleagues who read the manuscript of this edition just prior to publication and offered many gracious and constructive suggestions. Insofar as possible, their suggestions have been heeded and their assistance has been most helpful. These have been Dr. Robert Blanck, Director of the Graduate Program in Management, University of Redlands; Dr. Fred Dzara, Professor of Education and Dr. Warren B. Fruechtel, Professor of Education, both of the Department of Educational Services, Edinboro University of Pennsylvania; and Dr. F. Andrew Schoolmaster, Assistant Professor, Department of Geography, North Texas State University. Together, their suggestions have greatly improved this edition, and the author is most appreciative of their assistance.

One esteemed colleague sounded the basic theme of the book. "Tell them the obvious," he advised. "It may be exactly-what they need to know!" That is what the author has tried to do.

Those of us who have had the mystery of research procedure opened to us by other wise and devoted mentors may forget that the obvious was precisely what *we* needed. We know the basic reference works and the "keys" to the library so well that we do not consider it incumbent to tell others about them; the reading of a statistical formula for us is so simple that we would never think of teaching a student how to read one; a proposal for us is such a commonplace document that we would seldom entertain the thought that perhaps the beginning student in research needs explicit instructions on how to write one. All these matters are very obvious—to us! To many of our students they are deep secrets and dark mysteries.

Perhaps it is at the very point of the obvious where many students lose sight of essentials. This book is an attempt to restore academic sight to those who see, either with dim vision or, as in the case of many, with none at all. Deal gently with the author, therefore, at those places in the text where he seems to indulge in the banality of the obvious.

And now, perhaps our first exercise in seeing will be to try to discern what research really is.

P. D. L.

THE RESEARCH PROCESS

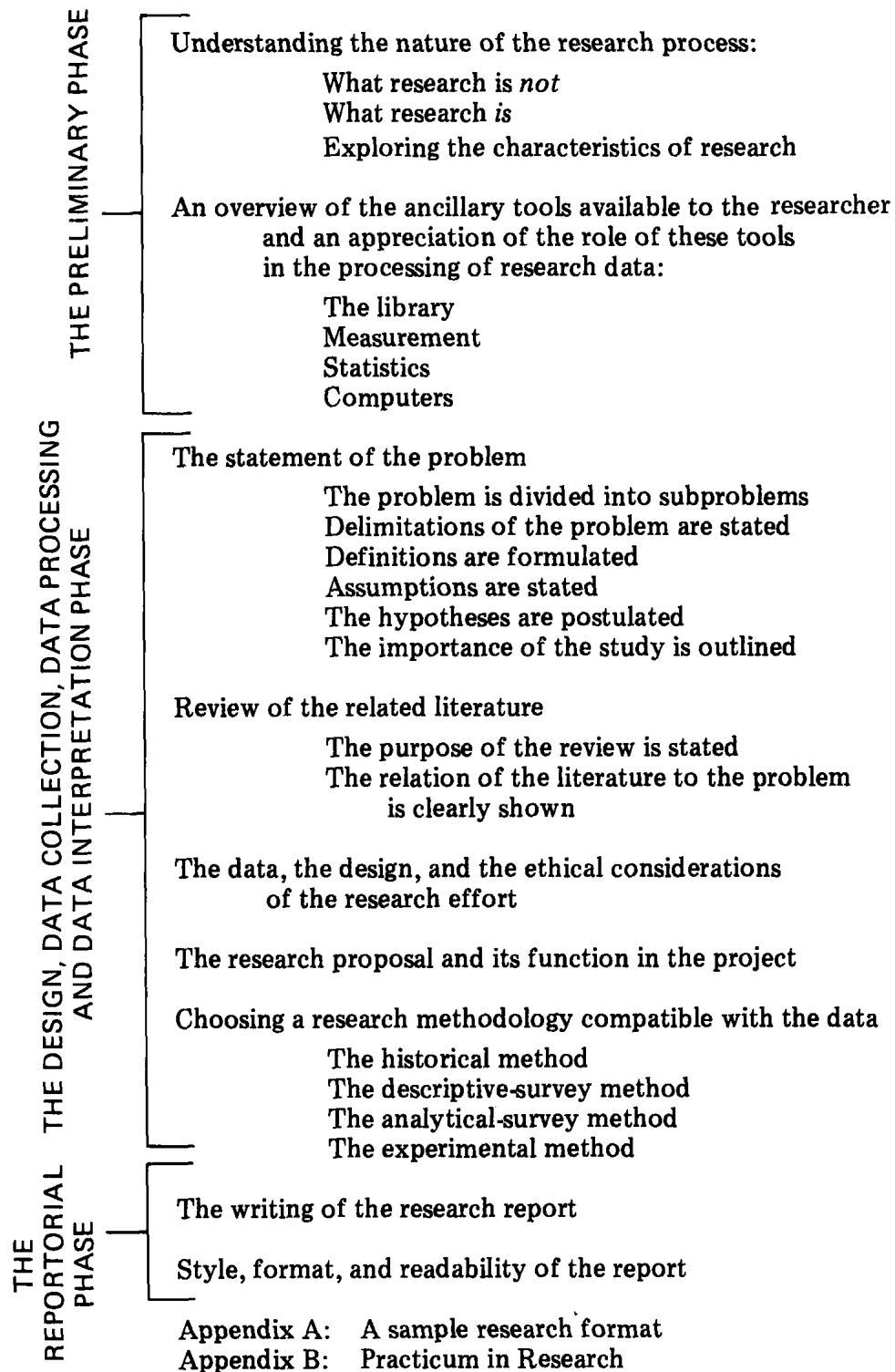


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RESEARCH AND THE TOOLS OF RESEARCH

- 1. What Is Research?**
- 2. The Tools of Research**

READ THIS—BEFORE YOU READ THIS CHAPTER

Research is a broadly misunderstood word. First, then, it is important that you get the right orientation to this term as it is used professionally. To that end, this chapter aims at two objectives:

1. To suggest what research is not,
2. To outline what the research process is.

A diagram at the close of the chapter will summarize all that we have said about the research process. It is a cyclical, or helical, process that begins with an unanswered question and strives, through the study of relevant facts, to determine the answer to that question.

At the end of the chapter you will have an opportunity to apply what you have learned. You will also find suggestions for further reading on many of the topics the chapter discusses.

What Is Research?

Research is a confusing term.

It has so many meanings that we must understand precisely what it means. We shall discuss in this book what is commonly referred to as *basic* or *pure research*.

Much that is said about basic research will also apply to the several other varieties of research activity: applied research, action research, research and development, and so on. The difference between pragmatic forms and the basic form of research lies in the depth to which basic research probes the underlying causes and meaning of observed phenomena and in the sophistication with which it demands that the collected data of observation be interpreted.

WHAT RESEARCH IS NOT

To understand more readily what research *is*, we begin by considering what research is *not*. Some of the statements that follow may come as a distinct shock to the conventional way in which you may have accepted the meaning of the term *research*. The reason for your surprise may be, in part, because you have been conditioned to the term in so many connotative frameworks that you may not be sure exactly what the term really does mean. Hence, when many students encounter the term for the first time in a truly professional and academic sense, it bewilders them.

Bewilderment is natural. It arises from a misconception—a wrong view that most of us have with respect to the real meaning of the word *research*.

The reason is simple. The word *research* has been so loosely employed in everyday use that few of us have any idea of its real meaning or operative implications. The word has become common jargon. It is used in every situation from an attention-getting phrase to the description of the process whereby a significant discovery is made in a scientific laboratory. The carelessness of its use has robbed it of any real meaning.

Take a case in point. You open an envelope in the morning's mail. As you pull out its contents, a statement greets you that because of "years of *research*" a new product has been developed to clean your car with a miracle shine. The words, "years of *research*," capture your attention. You order the product, and what do you get from "years of *research*"? Liquid soap! No research; merely the employment of the term to attract the reader's attention.

A high school student completes a "research paper" on the role of the "Dark Lady" in the sonnets of Shakespeare. No doubt the student went through some of the motions associated with research, such as gathering information on note cards, collecting a bibliography, and footnoting in prescribed form the material gathered from various documentary sources. To the student, it seemed like an elaborate effort indeed. Furthermore, both the student and the teacher who assigned the paper seem quite serious in thinking of this as a genuine "research project."

But no matter how elaborate the collection of data, the mere accumulation of fact is not research. It is, rather, an exercise in information-gathering, in library-orientation, in ferreting out relevant bits of factual data, in self-enlightenment—but it is not *research*.

Unfortunately, many students have labored under the delusion that looking up a few facts and writing them down in a documented paper constitutes research. Such an activity is, of course, nothing more than *fact finding* and *fact transcribing*. No amount of mere transfer of information from one place to another—even though the act of transportation is done with benefit of note card and is acknowledged by proper footnote form—

can be dignified by the term *research*. *Transfer of information, transportation of fact from one place to another are simply what their activities suggest, nothing more!* Yet, the strange misconception persists that fact-transferral is research; and, what is even more disconcerting, it is aided by the student's teachers and professors as the student moves through the educational network from grade school to high school, high school to college, and from college to graduate school.

When, therefore, the student comes to graduate study and is faced with a first course in research methodology or a seminar in research design, such a student is usually completely unprepared for the unfamiliar demands of a radically new academic approach. Hence, many students have difficulty in fulfilling the exacting demands required for writing a thesis or producing an acceptable dissertation. In such circumstances, students may either give up in frustration or, after many attempts, write such a mediocre final document that the graduate committee capitulates, despairing of ever getting a piece of real research from such a student. Nor is there any pride nor satisfaction in this bitter experience. Such students have never been taught what research really is. Facts have been glorified as ends in themselves rather than as components of a total process of which the ultimate aim is to reveal new insights and comprehend their meaning in a larger context.

Now, having looked at what research is not, let us look at what research indeed is.

WHAT RESEARCH IS

What, then, is research? *Research is the manner in which we attempt to solve problems in a systematic effort to push back the frontiers of human ignorance or to confirm the validity of the solutions to problems others have presumably resolved.* Ultimately, research is a way of thinking. It is a way of looking at accumulated fact so that those data become meaningful in the total process of discovering new insights into unsolved problems and revealing new meanings. For those who have never processed data or pursued facts to fresh interpretations, research can be a highly exhilarating experience. Research is the thrill that comes with the making of a new discovery. We shall discuss research as a process that enlists the assistance of the scientific method in solving perplexing problems and resolving unanswered questions.

Characteristics of Research

Research has seven discrete characteristics. Every professional researcher is familiar with these which, taken together, comprise the particular approach to a problem-solving process called *research*.

1. *Research begins with a problem in the form of a question in the mind of the researcher.*¹ The human being is a curious animal. Everywhere we look, we see phenomena that arouse our curiosity, that cause us to wonder, to speculate, and to ask questions. By asking questions we strike the first spark of an inquisitive attitude that is a germinal prerequisite for research. An inquisitive mind is the beginning of research. So much there is that we do not know. The hope of mitigating our ignorance depends upon the questions we ask in the presence of the facts than can dispel that ignorance.

Look around you. Consider the unresolved situations which evoke the questions: "Why?" "What's the cause of that?" "What does it all mean?" Questions like these are the point at which research begins.

¹ See Fred N. Kerlinger, *Behavioral Research: A Conceptual Approach* (New York: Holt, Rinehart and Winston, 1979), p. 32: "... a scientific research problem is first a question, a sentence in interrogative form. Second, it is a question that usually asks something about the relations among the phenomena or variables. The answer to that question is sought in the research."

2. *Research demands the identification of a problem, stated in clear, unambiguous terms.* Successful research begins with a clear, simple statement of the problem that the researcher seeks to resolve. A question must crystallize at the very beginning of the research effort into a precise and grammatically complete statement setting forth exactly what the ultimate goal of the research is. The reason for this is obvious. We must see clearly at the outset what it is we are attempting to research. Research consists of a three-way triangle: the problem, the researcher, and the facts; and each of these components must be seen clearly and evaluated accurately in order for research to be fruitful and rewarding.

In a later chapter we shall say more about the problem, because the necessity for an unambiguous statement of the problem that the research aims to resolve cannot be over-emphasized, nor too well be understood.

3. *Research requires a plan.* Researchers do not hope naively that somehow, in some way, they will discover fortuitously the facts that they need or the truth that they seek. Research is not aimless, undirected activity—merely “looking something up” in the hope that you may “come across” the solution to your problem. Research, rather, demands a definite aggressive plan. It means that your activity must have direction as the result of conscious planning and that the whole research effort must be governed by a purposive and overall design. Consider the title of this book, *Practical Research: Planning and Design*.

4. *Research deals with the main problem through appropriate subproblems.* The first step in planning research is to inspect the main problem for research in terms of its appropriate subproblems. Most researchable problems subsume other problems of lesser breadth and importance which, collectively, are component parts of the whole. The first step in thinking in the manner of a professional researcher is to recognize the subsidiary and integral components within the larger problem.

Because many researchers take neither the time nor the trouble to isolate the lesser problems within the major problem area, they find their research project becoming poorly defined, cumbersome, and unwieldy. From a design standpoint, therefore, it is expedient to divide the main problem into appropriate subproblems, all of which when resolved will result in the solution of the main research problem.

Note how a photographer deals with subproblems in solving a principal problem. He wants to take a picture. Can I capture this scene on film? That's the principal problem. But before he can answer this question, he must resolve three other questions integral to it: (1) Is there sufficient available light? (2) What is the “speed” of the film? (3) What is the “speed” of the lens? They are indeed *subproblems* to his main problem and he cannot resolve the main problem without answers to these several integral parts of which the main problem is composed.

5. *Research seeks direction through appropriate hypotheses and is based upon obvious assumptions.* Having stated the problem and the attendant subproblems, each of the subproblems is then viewed through a logical construct called a *hypothesis*. A hypothesis is a logical supposition, a reasonable guess, an educated conjecture which may give direction to your thinking with respect to the problem and thus aid in solving it.

Hypotheses are a part of everyday life. They represent the natural working of the human mind. Something happens. Immediately, you attempt to account for the event by a series of guesses. In so doing, you are hypothesizing. For example, you turn the key of your car. The starter grinds, but the car does not start. You are confronted with a problem: What's wrong? You now begin a series of reasonable conjectures as to the cause of the trouble. In other words, you hypothesize several possibilities: (1) You have no gasoline in the tank. (2) The spark plugs are worn out. (3) Moisture has condensed in the distributor, causing the electrical system to short-circuit.

Each of these hypotheses *provides a direction for solving the problem*. At this point, you go in search of the facts. You check the fuel tank; it is half full of gasoline. That rules

out hypothesis 1. The motor has just been reconditioned and new plugs have been installed. That invalidates hypothesis 2. As you glance out of the window of your car, you note that other automobiles have condensation on them from the humidity and an early morning fog. Hypothesis 3 may lead you to the solution of the problem. To test this hypothesis, you remove the distributor cap, wipe out the moisture that indeed has collected there, and replace it. The car starts. Hypothesis 3 is supported.

Similarly, when you are faced with a problem for research, you make educated guesses to assist you in discovering the solution and to give you direction in looking for the facts.

A distinction should be made here between a hypothesis and an *assumption*. Hypotheses are conjectural suppositions, held in abeyance to determine their validity or invalidity until the facts are available and their interpretation has been made. Ultimately, the facts will either support or fail to support a hypothesis.

An *assumption*, on the other hand, is a condition which is taken for granted and without which the research effort would be impossible. Here is an educational situation. Students are beginning the study of algebra. The question (problem) is: If students are given daily encouragement, will they achieve better than those who are not given such encouragement? Achievement is to be measured by a pre- and post-test evaluation. We may *hypothesize* that such encouragement will produce increased mathematical achievement. We *assume* that the teacher who is teaching the group is capable of giving encouragement to some students and to refrain from giving encouragement to others—that he or she can be totally objective in this aspect of teaching. If the teacher is not able to do this, then the whole basic proposition upon which the research rests is lacking and the research project cannot be effected. *Assumptions are self-evident conditions inherent to the research situation without which the entire research process is nullified.* Assumptions are usually so self-evident that many times we consider it unnecessary to mention them; but careful researchers usually do, so that those inspecting the research procedure may see every component within that process and evaluate it accordingly.

6. *Research deals with facts and their meaning.* Having now isolated the problem, subdivided it into appropriate subproblems, posited hypotheses which suggest the direction in which the facts may lie, and recognized the assumptions underlying the entire research project, the next step is to collect whatever facts seem to be appropriate to the problem and to *organize* them into meaningful aggregates, so that they can be *interpreted*. We shall suggest methods of such organization in a later chapter.

Facts, events, happenings, and observations are themselves merely facts, events, happenings, and observations—nothing more. But they are *potentially* meaningful. *The significance of the data depends upon the way in which the facts are regarded.* Different researchers frequently derive entirely different meanings from the same set of data. And, for the researcher, no single rule will guide unerringly to any “correct” interpretation. Two historians study the same series of events. Each is equally competent, both scrupulously honest in their reactions. One reads the meaning of the facts of history one way; the other, viewing precisely the same facts, arrives at an entirely different interpretation. Which one is right? Perhaps both are, or perhaps neither is. And both may have, perhaps, merely posed new problems for future researchers to resolve.

Time was when we considered that clocks measured time and yardsticks measured space, and in one sense they do. We further assumed that time and space were two separate entities. Now we regard both of these factors within a time-space continuum concept. The facts of time and space have not changed. The difference between the earlier and the later concepts is the difference in *the interpretation of the facts*. All research, sooner or later, must arrive at the point where the facts must be made meaningful, and that takes place within the mind of the researcher. It is precisely at this point where all the activities outlined in the opening paragraphs of this chapter fail as fulfilling the requirements of

research. None of them demands that the researcher *interpret* any data. Fact-finding and fact-transferral are *not* research; research begins when the researcher reads meaning from the accumulated facts and interprets from the data their message with respect to the problem which initiated the research in the first place.

7. *Research is circular.* The research cycle begins simply: a questioning mind faces a problem situation. To see the target clearly, the researcher isolates and articulates the *central problem*. The central problem is then further divided into subproblems, each of which is an integral part of the principal problem. What we have been calling the “environment out of which the researchable problem arises” is more appropriately called the *research universe*,² and it is potentially fact-laden. The researcher seeks from within the universe for those particular facts that seem to be pertinent to the solution of the problem and its attendant subproblems. The search is facilitated by the construction of tentative hypotheses because they point in the direction of relevant facts. The collected facts are organized, analyzed, and interpreted for the purpose of discovering what they mean in terms of the problem. This facilitates the solution of the problem, which satisfies the question that gave rise to the research effort originally. Thus, the cycle is completed. Such is the format of all basic research.

Schematically, the “circle of research” is represented by the diagram on page 8. In a truer sense, this circle might be considered more like a helix than as a circle. Research always gives rise to further unexplored questions. In the helical conception, the solution of the research problem begets still other problems, and thus research becomes a spiral continuing progressively onward. To view research in this way is to invest it with a dynamic quality that is its true nature—a far cry from the common view of research as a one-time act, static, self-contained, and as an end in itself. Every researcher soon learns that research creates more problems than it resolves. Such is the nature of research.

Practical Application —————

We learn to do by doing. This book is more than a theoretical discussion of research and its methodology. You become a researcher by the practical application of those principles which form the basis of discussion. Following each major discussion area, you will have an opportunity to turn to the practicum section where you will have an assignment applying those principles which were discussed in the text section of the book. We have been discussing what research is—and what it is not. At this point, you should be able to recognize genuine research when you see it, and also what is not research but masquerades as research. Turn to page 283 where you will find a practical application unit which will give you directions for surveying some research studies and evaluating them in terms of the guidelines suggested in this chapter.

Throughout the book, you will be alerted to the practical applications in the Research Practicum Section by the heading “Practical Application” followed by a dotted line leading to a characteristic wide band of gray screening down the right margin of the text.

—————

²The term *universe* means simply an “area surrounding the problem which may contain facts relevant to the problem.” Literally, the word suggests the factual area that lies, or “turns,” around the central inquiry or main problem of the research. The word comes from *uni-*, one, and *vertere*, to turn: that which revolves or turns about one central inquiry.