CHAPTER 1

Introduction

If you have penetrated very far in your study of psychology, you are aware that the field consists of multiple subareas or specializations. Indeed, a glance at the table of contents of any introductory psychology book will reveal this diversity, with chapters devoted to perception, cognition, personality, and a dozen or so other topics as well. Each topic addresses questions of importance to psychology as a whole, which, of course, is why the different subareas exist.

Each topic also has its special fascinations for those who have made it their object of study. Although any psychologist appreciates the importance of the field's many subareas, probably most believe that their own specialization is especially interesting and important. Why else would they devote a career to its study?

Because I am a developmental psychologist, it will come as no surprise to learn that I believe that developmental psychology is especially interesting and important. The case is not hard to make. Certainly no branch of psychology is broader in scope than developmental. And certainly no branch of psychology addresses more fundamental scientific issues than does developmental, because developmental psychology simultaneously encompasses all the other areas of the field (perception, thinking, personality, etc.) and adds to them a single basic question: How do people get to be the way they are? How is it, for example, that virtually all people come to understand and use an incredibly complex language system? Where do individual differences in intelligence or personality come from? What are the effects of early child-rearing practices on later development? Questions such as these cut to the heart of what psychology as a science can potentially tell us.

Such questions are not only of scientific interest. More obviously than any other branch of the field, developmental psychology speaks to issues that make a difference in the lives of everyone. Consider again some of the questions posed in the preceding paragraph. The issue of early experience and later development may be a fascinating scientific problem for the researcher, but it is a matter of urgent practical importance for any parent concerned with the optimal development of his or her children. That people differ in intelligence may raise a number of intriguing theoretical questions, but this fact also has enormous interpersonal and societal consequences. One of the exciting things about being a developmental psychologist is this feeling that one is dealing with questions that really matter.

Answers to such questions do not come easily, however. Indeed, it often seems that the most basic and important questions are the hardest to resolve. The difficulty of doing good research is a continuing theme throughout the book and

hence need not be documented here. But let us briefly consider one example to introduce some general points. It is a problem that has already been touched on twice: drawing a relation between parental child-rearing practices and child development. How might we study this problem scientifically?

To anyone with even a rudimentary background in scientific methods, the general answer to this question is obvious: through controlled experimental study (if this answer is *not* obvious, it should become so in Chapter 2). What the researcher might do, for example, is randomly assign infants at birth to families of different backgrounds and different child-rearing philosophies. Effects of child-rearing practice could then be determined apart from the contributions of the parents' genes to the children's development. Or the researcher might decide to assign different child-rearing practices on a random basis to different families. This procedure would avoid the confounding factor of parental choice in child-rearing and allow a clear focus on the child-rearing methods themselves. The researcher might even decide, for purposes of comparison, to include a group of parents who rear their own children in whatever way they wish. In any case, the researcher would study the children as they grew and take extensive measures of their development. If such research could be carried out for even a few years, we would know much more about the consequences of different methods of child-rearing than we do now.

Needless to say, the research program just outlined is the stuff of science fiction (or of methods textbooks), not fact. We do not have experiments of this sort, and it is to be hoped that we never will. In this case the ethical problems are clearly sufficient to prohibit the research. If they were not, the practical difficulties in actually carrying out such studies would be staggering. These two factors—ethical limitations and practical constraints—act to rule out many well-designed, "textbook-like" experiments that any developmental psychologist could easily dream up. The result is that we have to fall back on less scientifically satisfactory methods of gathering the desired information. That such methods do exist, and that they lead to genuine gains in knowledge, is another continuing theme. But the appropriate methods and the resulting knowledge often do not come easily. As two veteran developmental researchers note, "The study of human development in all its richness, dynamism, and contextual variation is not rocket science—it is actually far more challenging" (Damon & Lerner, 2008, p. xi).

The main points of the discussion thus far are easy to summarize. Developmental psychology addresses questions that are of both great scientific and great practical importance. Studying such questions is often very difficult, and these difficulties place serious constraints on what can be known. Nevertheless, methods of study do exist, and gains in knowledge are being made literally every day. What we have, then, is a field of study in which the potential benefits of research are great, the challenges to successful study formidable, and the progress in knowledge slow but meaningful—in short, an ideal place for an ambitious researcher.

Goals of the Book

This book has three general goals. The first and most obvious is to help promote the skills necessary to do good research in developmental psychology. To this end, principles and precepts of various sorts are presented. Some of these principles are specific to issues of development; others are more general to the field of psychology. Some, indeed, are not even specific to psychology but reflect applications of the general scientific method. Whenever possible, however, I embed the discussion within the context of developmental issues. And, as already suggested, developmental psychology presents enough methodological problems of its own to challenge any researcher.

A second goal is to provide exposure to important research areas within the field. No one, after all, does "research in development"; studies

are always directed to some particular content area, and every content area presents its own set of methodological challenges. It is impossible in one book to cover every interesting topic in the field or to convey everything about any given topic. But we can make a start on some of the most interesting and well-studied topics.

The third goal is to foster skills necessary for critically evaluating research and the conclusions that can be drawn from research. Such skills, of course, are not separate from those needed to carry out studies, but most of us are likely to use them far more often. Not everyone is going to do research in developmental psychology, but everyone is a consumer of the results of such research. Consider again some of the practical issues for which research in developmental psychology is relevant. Is physical punishment ever justified when disciplining children, or should such techniques be avoided altogether? Does violence on TV or in video games promote aggression in children? Should early enrichment programs be provided for children at risk for school failure? Are mandatory retirement ages ever justified, and if so, for what kinds of occupations? And what sort of research programs, if any, should the federal government support? Questions such as these are of interest to every parent, taxpayer, or voter. Intelligent answers to the questions are most likely if one knows the conclusions that have been drawn from relevant research. Intelligent answers are even more likely if one knows the methodology behind the research and can sensibly weigh the various strengths, weaknesses, and uncertainties when evaluating the conclusions.

Steps in a Research Program

What are the things that must go right in the course of a study if the final product is to be an increment in knowledge? The answer is quite a number of things, most of which are discussed at length in later sections. The purpose of the present section is simply to provide an introductory orientation to the skills necessary to do good research—a brief overview and a preview of topics to come.

The starting point for any successful program of research is *good ideas*. This is at once the most obvious and the least teachable of the various requirements. Because it is both obvious and difficult to teach, the criterion of good ideas tends to be neglected in discussions of how to do research, the focus instead being on the skills necessary to implement whatever ideas one may have. This neglect will hold true here as well. It is important to remember, however, that all the technical skill in the world will not save a study if the ideas behind it are not any good. It is important to realize too that the really important differences among researchers—the factors that separate the average researcher from the one whose research shakes the field—lie less in the technical skill with which they execute studies than in their abilities to think in truly original and penetrating ways about an issue.

The difficulty of teaching how to generate good ideas does not mean that no such attempts exist. Among the sources worth exploring are Cone and Foster (2006), Gray and Wegner (2013), Joireman and Van Lang (2015), Leong and Muccio (2006), and McGuire (1997). Two general points emerge from such discussions. One is that ideas can have many sources; McGuire identifies 49 heuristics for generating ideas, and Leong and Muccio discuss four general approaches (personal strategies, interpersonal strategies, printed sources, computer strategies), each with multiple entries. The other point is the necessity of not only generating but also evaluating ideas. An original idea is a necessary starting point for research, but it is not sufficient. The idea must be one that can be successfully implemented, and it must be one that has the potential to add to what is known about some topic of interest.

The point about evaluating one's ideas can serve as a transition to the second criterion for successful research: *knowledge of past work*. Indeed, this step might logically be listed as the first, because really good ideas probably cannot be generated without knowledge of what has

gone before. In any case, knowledge of the literature is essential when researchers come to evaluate just how testworthy their ideas are. There is little point in executing a brilliant idea for a study if someone else has already done the same thing. More common, perhaps, is the case in which certain important points of procedure would have been decided differently if the researcher had only known about similar work by others. Few things can be more depressing to an investigator than going to all the effort of carrying out a study and only then learning that the findings of some earlier study render the effort pointless.

Keeping abreast of the literature is no easy task at a time when professional journals publish thousands of articles in developmental psychology annually. Luckily, helpful sources do exist, many in electronic form. Table 1.1 summarizes the electronic databases that are most relevant for writing in psychology. Of these, probably the most helpful for the psychology researcher is PsycINFO. Among the guides with respect to how to use PsycINFO are Ford (2011), Reed and Baxter (2006), and Rosnow and Rosnow (2012). An online source of help is an American Psychological Association website devoted to PsycINFO (www.apa.org/pubs/databases/psycinfo/index.aspx).

Another valuable aid to literature searches are the various books and journals devoted to review articles on major topics. Table 1.2 lists and briefly describes some of the most helpful of these sources. Table 1.3 provides a list of some of the major empirical journals that publish research in developmental psychology. It is good practice to scan the most recent volumes of these journals before making a final decision about procedures. Note that all journals are now available in electronic form (indeed, some *only* in electronic form), and most university libraries have subscriptions to the major journals in the field. Finally, the best guide to past work may often come not from written sources but from consultations with an experienced researcher in the field. And bibliographic assistance aside, discussing one's ideas with others is generally a helpful part of the problem-solving process.

I will make one more point, one that I draw from Cone and Foster (2006). These authors note

Table 1.1
Sampling of Electronic Databases

Database	Description
PsycINFO	Provides abstracts of the published literature in psychology
PsycEXTRA	Provides access to unpublished sources in psychology of a variety of sorts (e.g., conference papers, technical reports, newsletters)
PsycARTICLES	Provides the full text of articles published in APA journals
PsycBOOKS	Provides full-text access to books published by APA as well as a number of historical and classical works
ERIC	Provides abstracts and in some instances full texts of both published and unpublished literature in education
Medline/PubMed	Provides abstracts of the biomedical literature
Social Science Citation Index	Provides abstracts and citation information for a wide range of publications in the social sciences literature

Note. From *Writing in Psychology* (p. 33) by S. A. Miller, 2014, New York, NY: Routledge. Copyright 2014 by Routledge. Reprinted with permission.

Table 1.2

Sources for Review Articles in Developmental Psychology

Advances in Child Development and Behavior (Volume 1 published in 1963, new volumes at an almost annual rate since)
Annual Review of Psychology (published annually since 1950)
Blackwell Handbooks of Developmental Psychology (volumes devoted to Infancy, Early Childhood, Adolescence, Cognitive Development, and Social Development, published from 2001 to 2016)
Handbook of Child Psychology, 7th edition, 2015
Handbook of Life-Span Development, 2010 (edited by Lerner et al., published by Wiley)
Handbook of Life-Span Development, 2011 (edited by Fingerman et al., published by Springer)
Handbook of the Psychology of Aging, 8th edition, 2016
Minnesota Symposia on Child Psychology (published annually or biennially since 1967)
New Directions for Child and Adolescent Development (multiple volumes each year since 1978)
Developmental Review (journal of reviews of research in developmental psychology)
Psychological Bulletin (journal of reviews of research in all areas of psychology)

Table 1.3

Sources for Empirical Reports in Developmental Psychology

Applied Developmental Science	*Human Development*	*Journal of Experimental Child Psychology*
British Journal of Developmental Psychology	*Infancy*	*Journal of Genetic Psychology*
Child Development	*Infant and Child Development*	*Journal of Gerontology*
Child Development Perspectives	*Infant Behavior and Development*	*Journal of Research on Adolescence*
Cognitive Development	*International Journal of Behavioral Development*	*Journal of Youth and Adolescence*
Development and Psychopathology	*Journal of Adolescence*	*Merrill-Palmer Quarterly*
Developmental Psychology	*Journal of Applied Developmental Psychology*	*Monographs of the Society for Research in Child Development*
Developmental Science	*Journal of Applied Gerontology*	*Parenting*
Early Childhood Research Quarterly	*Journal of Cognition and Development*	*Psychology and Aging*
Experimental Aging Research	*Journal of Early Adolescence*	*Research in Human Development*
Gerontologist		*Social Development*

that some students suffer from the "Nobel laureate error"—namely the belief that any study they design must be *the* definitive study that addresses and answers all the questions of interest. In fact, no study ever does this. Science is a cumulative enterprise, and hundreds or even thousands of studies may contribute to what we know about the major topics in the field. To add to this literature, a new study does not have to do everything; it merely has to do something of interest that has not been done before. Table 1.4 presents my own listing of some of the ways in which a study can go beyond what is already known. The table includes several concepts not yet discussed and thus may not be completely comprehensible at this point; it is intended simply as a preliminary guide that can be returned to as needed.

Once the ideas for the study have been generated, the next step is to translate them into an *adequate experimental design*. It was suggested earlier that a technically perfect design is of little value if the ideas being tested do not merit study. I now add the converse point: that a brilliant idea may come to nothing if it cannot be embodied in a scientifically testable form. Matters of experimental design are a central topic in the coming chapters. For now, two points can be made. The first is a reiteration of a point made earlier. Very often in developmental psychology, ethical or practical constraints rule out research designs that, from a purely scientific point of view, would be ideal for studying an issue. The challenge then becomes to devise alternative procedures that can lead to valid conclusions. The second point is that designs in developmental psychology are often complicated by the fact that age is included as a variable of primary interest. As we will see later, age is in some ways an especially difficult variable with which to work. But, of course, changes with age are of great interest for most developmental psychologists.

Our hypothetical researchers have now reached the point at which they have an idea for a study, have surveyed the relevant literature, and have decided (at least tentatively) on an experimental design. The next step is to seek *human*

Table 1.4

Examples of Ways to Build on the Existing Research Literature to Create a New Study

Create a new measure to study some construct of interest.
Modify an existing measure to study some construct of interest.
Extend an existing measure to some group or groups not previously studied.
Combine in the same study elements that previously had been studied separately.
Modify the range of an independent variable.
Divide a dependent variable into separate components.
Test an as yet unproven hypothesis derived from a theory.
Devise a procedure to resolve a conflict in the literature.
Devise an experimental approach to an issue that had only been studied correlationally.
Devise a correlational approach to an issue that had only been studied experimentally.
Devise a longitudinal approach to an issue that had only been studied cross-sectionally.

Note. Adapted from *Writing in Psychology* (p. 75) by S. A. Miller, 2014, New York, NY: Routledge. Copyright 2014 by Routledge. Reprinted with permission.

subjects approval for the research—that is, to submit a proposal to the university committee responsible for monitoring the ethical conduct of research. Ethics is the subject of Chapter 10, and there will be much to say then about both procedures to follow and criteria to consider when evaluating ethics. For now, I settle for one basic point—the need for independent determination of the ethics of research. Researchers must, of course, do everything possible to ensure that their own research projects are ethical. They may not make this decision alone, however; rather, research can proceed only after an independent committee has been satisfied that the research is ethically sound.

Although the next step is not a necessary one in all research projects, in particular cases it may be essential. It is to carry out a *pilot study*—that is, to do some preliminary testing and practicing before beginning the experiment proper. There are two general reasons for pilot testing, both of which may be especially important in work with children. One reason is to give the tester practice in working with the particular procedures and subject groups, the goal being to minimize experimenter error once the real study starts. The second is to test out any uncertain aspects of the procedure to make certain that they work as intended. Are the instructions clear? Is the test session a reasonable length? Is a particular experimental manipulation convincing? The actual questions will vary from project to project, but the general issue is the same: Is the study ready to go?

Assuming a positive answer to the ready-to-go question, the next step is again an obvious one: *obtaining research participants*. Obvious though this step may seem, it is not discussed in many textbooks on methodology, in which experimental designs somehow magically eventuate in data without the messy intermediate step of finding people on whom to try them (but see Streiner & Sidani, 2010, for an exception). In fact, many researchers spend a good portion of their professional careers not in the interesting business of thinking up research, but in the much more tedious business of finding participants with whom to do the research. This situation is especially true for developmental psychologists, who do not have readily available populations such as college sophomores or laboratory rats with which to work. Researchers of infancy cannot post sign-up sheets on which babies can volunteer for experiments; they must somehow locate parents with infants and induce them to bring their babies in for testing. The researcher who wishes to study large samples of 5-, 7-, and 9-year-olds will almost certainly need to work through a school system to find sufficient numbers to test (for helpful suggestions about how to do so, see Alibali & Nathan, 2010). The investigator of possible changes in functioning with old age will need to locate and recruit older participants, possibly through contacts with various organizations that serve older people. All of these groups can present special problems of access.

It is difficult to offer specific guidelines with respect to obtaining participants, because procedures may vary from one locality to another. A few pieces of general advice can be offered, however. One is to allow plenty of time. Research almost always takes longer than the beginning researcher expects it to, and one common contributor to the delays is difficulty in obtaining participants. A second piece of advice is to be as persuasive as possible when presenting one's proposed research to those (principals, teachers, parents, children themselves) who must decide about participation. As is stressed in Chapter 10 on ethics, the primary consideration when presenting research to prospective participants is to be honest and informative so that decisions about participation can be fairly made. It is also important, however, to be clear about the value of the research, or else no one may decide to participate. Finally, perhaps the most helpful course, once again, is to find an experienced investigator of the subject group in question and solicit advice about how to proceed.

Once participants have been recruited, the testing can begin. At this point, the experimenter's *testing skills* become important. The phrase *testing skills* refers here to all of the abilities needed in actually working with research participants, whether in face-to-face interactions or in observing and measuring behavior. At issue, then, are questions of the following sort: Have the instructions clearly conveyed what is required? Has the tester biased performance through facial cues or inadvertent reinforcement? Have the responses been accurately recorded? The issue, in short, is whether the on-paper study that has been worked out in advance can be adequately realized in the actual experimental setting. Again, it is clear that a successful passage through the earlier steps of the research process will be of no avail if the present step is not also negotiated successfully. A researcher, for example, may have devised a beautiful plan for studying problem solving in 5-year-olds, but the results are not likely to mean much if the researcher has no conception of how to talk to 5-year-olds and consequently leaves the children either frightened or bewildered.

Discussions of testing skills occur at various places throughout the text, with the most concentrated coverage coming in Chapter 5. As noted, some of the points made are general ones that apply to psychology as a whole, and others are specific to developmental psychology. Although any kind of research can be difficult, the researcher in developmental psychology often faces special problems that stem from the special nature of the subject groups tested. Skills that are sufficient when testing a college student may not be sufficient when working with a crying infant, a shy preschooler, or a suspicious octogenarian. The challenge is even greater if several distinct age groups must be accommodated within the same study.

No aspect of research methodology can be conveyed in a totally adequate fashion through a textbook alone. In no case, however, is a textbook treatment less adequate than for the question of how to work with participants. Although various guidelines can be given verbally, the only real way to become skilled in working with infants, preschoolers, or older adults is to spend considerable amounts of time actually working with infants, preschoolers, or older adults.

The conclusion of the testing does not mean that the researcher's job is done. The next step is the *statistical analysis* of the data. The question that must be answered now is whether the various factors under study have or have not produced a consistent and meaningful pattern of results. For the majority of studies, the accepted way to answer this question is through application of certain well-developed statistical procedures to the data. This statistical analysis will not, in itself, answer deeper questions about the theoretical or practical significance of the results. It does, though, set constraints within which such interpretations must operate.

Statistical analysis is a large topic, the subject of separate courses and books. This book does not cover it at any length. Chapter 9, however, does provide a summary of certain general principles of statistics.

The final phase of a research program is the *communication* of what has been done and found. Science is a matter of shared information, and a research finding is simply not a finding until it has been communicated to others. The usual way to communicate findings in developmental psychology is through publication in a professional journal. Such publication requires that the researcher prepare a clear, accurate, and concise written report of the study. Chapter 11 gives advice about how to prepare such reports.

Plan of the Book

The next six chapters deal with general principles of design and procedure. Chapter 2 is, in fact, titled "General Principles"; it considers such basic concepts as independent and dependent variables, experimental control, and various forms of validity. Chapter 3 is titled "Design"; its concern

is the different ways in which studies can be constructed and the comparisons and conclusions that are possible given the different approaches. Because of the book's developmental focus, special attention is paid to designs for comparing different age groups.

In Chapter 4, "Measurement," the focus shifts from the independent variable to the dependent variable, the concern being the ways in which we measure the outcomes in research. Decisions about both design and measurement must actually be implemented, and this is the topic of Chapter 5, "Procedure": challenges that can arise in translating an on-paper study into an actual study as well as ways to overcome the challenges. Finally, Chapter 6, "Contexts," addresses two questions: the kinds of settings (e.g., structured lab environment, natural field setting) in which developmental research occurs and the environmental contexts in which development takes place.

The next two chapters are devoted to forms of research whose importance and whose methodological challenges justify a separate consideration. Chapter 7 discusses various approaches that fall under the heading of Qualitative Research, and Chapter 8 considers work under the Applied Research heading.

Chapters 9 through 11 address three of the essential steps in executing research. Chapter 9 presents some general principles of statistical tests and statistical reasoning. Chapter 10 discusses ethical issues in research in developmental psychology, and Chapter 11 presents guidelines for writing papers in psychology.

The final section of the book is devoted to specific research areas in developmental psychology. Chapter 12 is concerned with methods of studying development in infancy. The next two chapters are topically defined. In Chapter 13, the focus is on ways to study cognitive development, especially during early and middle childhood; in Chapter 14, the concern is the study of social development. Finally, in Chapter 15 the focus is again chronological, with a discussion of methods of studying development in old age.

Summary

The chapter begins with a discussion of both the importance of research in developmental psychology and the challenges in doing such research well. This discussion leads to an overview of the three general goals of the book: to foster the skills necessary to carry out research in developmental psychology, to provide an introduction to interesting and important research topics in the field, and to promote the critical-evaluative skills that will allow readers to become intelligent consumers of research.

The middle section of the chapter provides an orientation to the steps that must be successfully negotiated if a research project is to be informative. The starting point is both the most important and the least teachable of the steps: generating *good ideas* that are worthy of empirical study. A closely related and perhaps even prior step is *knowledge of past work*, for research always grows out of what has gone before. Good ideas must be translated into an *adequate experimental design*, from which clear and valid conclusions can be drawn. Before research can begin, it is necessary to receive *human subjects approval*, and it is often useful to carry out a *pilot study*, both to refine uncertain aspects of the procedure and to sharpen testing skills. Another important and often difficult preliminary to research is *obtaining participants*: identifying the appropriate subject group and then securing its cooperation. Once the study begins, the experimenter's *testing skills* become important—that is, all the skills needed to interact with participants and observe behavior in nonbiasing ways. The conclusion of the data collection is followed by *statistical analysis* to determine what reliable and potentially informative patterns are identifiable in the results. The final step is the *communication* of one's research to others, usually in the form of publication in a professional journal.

The run-through of steps in a research program serves to introduce topics considered at various points throughout the book. Further

introduction is provided by the concluding section of the chapter, which briefly previews each of the remaining chapters.

Exercises

1. The text suggests that research in developmental psychology speaks to many everyday real-world issues of personal, social, or political importance. Spend a week or so thinking about this claim whenever you read the newspaper or listen to the news or check the news online. For how many of the topics that you encounter in the news might an understanding of principles of developmental psychology be in some way valuable?

2. One way to gain a quick impression of the topics of current interest within a field of study is by scanning recent issues of some of the field's major research journals. This is also a good way to get ideas for your own research. Select at least three of the journals listed in Table 1.3 and locate their most recent volumes either at your library or, if they are available electronically, online. Read the titles of each of the articles, and for any that you find intriguing, read the abstract (which provides a brief summary of the article) as well.

3. Select two topics in developmental psychology that especially interest you and conduct a PsycInfo search for each.

4. Most search engines lead to written sources of information about the topic in question. YouTube, in contrast, is a source for visual demonstrations of how dozens of outcomes in developmental psychology are typically measured. Select three outcomes that interest you and perform a YouTube search for each.