

RESEARCH METHODS IN CLINICAL PSYCHOLOGY

An Introduction for
Students and Practitioners

THIRD EDITION

Chris Barker, Nancy Pistrang and Robert Elliott

WILEY Blackwell

Research Methods in Clinical Psychology

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Contents

Preface to the Third Edition	x
About the Companion Website	xiii
1 Introduction: The Research Process	1
<i>The Research Process</i>	3
2 Perspectives on Research	5
Philosophical Issues	6
<i>What is Research?</i>	6
<i>What is Science?</i>	12
<i>Social and Political Issues</i>	17
Professional Issues	18
<i>The Intuitive Practitioner</i>	19
<i>The Scientist-Practitioner</i>	20
<i>The Applied Scientist</i>	20
<i>The Local Clinical Scientist</i>	21
<i>The Evidence-Based Practitioner</i>	22
<i>The Clinical Scientist</i>	22
<i>The Practice-Based Evidence Model</i>	23
<i>Comparison of Models</i>	23
<i>Implications for Clinical Training</i>	24
Personal Issues	24
<i>Why Do Clinical Psychologists Do Research?</i>	25
<i>Why Don't Clinical Psychologists Do Research?</i>	26
<i>Weighing up the Pros and Cons of Doing Research</i>	27
Chapter Summary	27
Further Reading	28
Questions for Reflection	28
3 Doing the Groundwork	29
Formulating the Research Questions	30
<i>Choosing the Topic</i>	31

	<i>Developing the Questions</i>	32
	<i>Hypothesis-testing versus Exploratory Research Questions</i>	33
	<i>Some Types of Research Question</i>	34
	<i>Literature Review</i>	37
	<i>The Proposal</i>	41
	<i>Funding</i>	44
	The Politics of Research in Applied Settings	45
	<i>Access</i>	45
	<i>Responding to Doubts</i>	46
	<i>Authorship</i>	48
	Chapter Summary	48
	Further Reading	49
	Questions for Reflection	49
4	Foundations of Quantitative Measurement	50
	The Process of Measurement	52
	<i>Domains of Variables</i>	52
	<i>Measuring Psychological Constructs</i>	52
	<i>Measurement Sources and Approaches</i>	54
	Foundations of Quantitative Methods	54
	<i>Positivism</i>	55
	Psychometric Theory	58
	<i>Definitions</i>	58
	<i>Reliability</i>	60
	<i>Reliability Statistics</i>	62
	<i>Validity</i>	64
	<i>Generalizability Theory</i>	67
	<i>Item Response Theory</i>	68
	<i>Utility</i>	69
	<i>Standards for Reliability and Validity</i>	70
	Chapter Summary and Conclusions	71
	Further Reading	71
	Questions for Reflection	72
5	Foundations of Qualitative Methods	73
	<i>Historical Background</i>	75
	Philosophical Background	76
	<i>Phenomenology</i>	77
	<i>Social Constructionism</i>	79
	Families of Qualitative Approaches	84
	<i>Thematic Analysis Approaches</i>	84
	<i>Narrative Approaches</i>	87
	<i>Language-Based Approaches</i>	88
	<i>Ethnographic Approaches</i>	90
	Ways of Evaluating Qualitative Studies	91
	Conclusion: Choosing and Combining Methods	92

Chapter Summary	94
Further Reading	94
Questions for Reflection	95
6 Self-Report Methods	96
<i>Mode of Administration</i>	99
<i>Open-ended and Closed-ended Questions</i>	100
Qualitative Self-report Methods	101
<i>Types of Qualitative Interview</i>	102
<i>Interview Schedule</i>	103
<i>Interviewing Style</i>	105
Quantitative Self-report Methods	109
<i>Questionnaire Design</i>	110
Chapter Summary	118
Further Reading	119
Questions for Reflection	119
7 Observation	120
Qualitative Observation	122
<i>Participant Observation</i>	122
<i>Text-based Research</i>	126
Quantitative Observation	128
<i>Background</i>	129
<i>Procedures for Conducting Observations</i>	130
<i>Reliability and Validity Issues</i>	134
Chapter Summary	135
Further Reading	136
Questions for Reflection	136
8 Foundations of Design	137
Nonexperimental Designs	138
<i>Descriptive Designs</i>	138
<i>Correlational Designs</i>	139
Experimental Designs	142
<i>Cook and Campbell's Validity Analysis</i>	144
<i>Nonrandomized Designs</i>	146
<i>Randomized Designs</i>	152
<i>Conclusion: Choosing a Research Design</i>	159
Chapter Summary	159
Further Reading	160
Questions for Reflection	161
9 Small-N Designs	162
<i>Historical Background</i>	163
Single-case Experimental Designs	165
<i>Procedure</i>	165

<i>AB Design</i>	166
<i>Reversal (or ABAB) Design</i>	167
<i>Multiple-baseline Design</i>	168
<i>Changing-Criterion Design</i>	169
<i>Data Analysis</i>	169
<i>Generalization</i>	169
Naturalistic Case-study Designs	170
<i>Narrative Case Studies</i>	170
<i>Systematic Case Studies</i>	171
<i>Time-Series Designs</i>	175
Conclusion	175
Chapter Summary	176
Further Reading	176
Questions for Reflection	177
10 The Participants: Sampling and Ethics	178
Sampling	179
<i>The Target Population</i>	181
<i>Bias and Representativeness</i>	182
<i>Sample Size</i>	183
<i>Alternative Approaches to Sampling and Generalizability</i>	185
<i>Summary and Conclusion</i>	187
Ethical Issues	188
<i>Informed Consent</i>	189
<i>Harms and Benefits</i>	191
<i>Privacy and Confidentiality</i>	192
<i>Ethics Self-study Exercise</i>	193
<i>Ethics Committees</i>	194
Chapter Summary	196
Further Reading	196
Questions for Reflection	197
11 Evaluation Research	198
<i>What is Evaluation?</i>	199
<i>The Sociopolitical Context</i>	201
Preparation for Evaluating a Service	203
<i>Aims and Objectives</i>	204
<i>The Impact Model</i>	205
<i>The Target Population</i>	205
<i>Estimating the Extent of the Target Problem in the Target Population</i>	206
<i>Needs Assessment</i>	207
<i>Delivery System Design</i>	208
Monitoring the Process of Service Delivery	209
<i>Coverage and Bias</i>	210
<i>Service Implementation</i>	211
Outcome Evaluation	212
<i>Client Satisfaction Surveys</i>	213

<i>Patient-focused Research and Outcomes Management</i>	213
<i>Cost-effectiveness</i>	214
Chapter Summary	215
Further Reading	216
Questions for Reflection	216
12 Analysis, Interpretation, and Dissemination	217
Qualitative Data Analysis	218
<i>Within-case and Cross-case Analysis</i>	219
<i>Preliminaries to Qualitative Data Analysis</i>	219
<i>Processes in Qualitative Data Analysis</i>	221
<i>Good Practice in Qualitative Analysis</i>	224
Quantitative Data Analysis	224
<i>Data Entry</i>	224
<i>Data Checking</i>	225
<i>Data Reduction</i>	225
<i>Data Exploration</i>	226
<i>Statistical Significance Testing for Answering the Research Questions</i>	227
<i>Analyzing the Strength and Significance of Quantitative Effects</i>	227
Interpretation	232
<i>Contributions to Knowledge: Understanding the Meaning of the Findings</i>	232
<i>Methodological Issues: Strengths and Limitations of the Study</i>	233
<i>Scientific and Practical Implications</i>	235
Dissemination	236
<i>Writing up</i>	237
<i>Publication</i>	238
<i>Authorship Issues</i>	239
<i>Utilization</i>	240
The End	240
Chapter Summary	241
Further Reading	241
Questions For Reflection	242
13 Epilogue	243
<i>Methodological Pluralism</i>	243
<i>Appraising Research</i>	244
<i>Combining Research with Practice</i>	246
<i>Some Images of Research</i>	247
Questions for Reflection	248
References	249
Author Index	277
Subject Index	287

Preface to the Third Edition

The first edition of this book came out more than 20 years ago, and the second more than 10. A lot has gone on during that 20-year time span, both in the book's subject matter and in our own professional lives. When we wrote the first edition, we were junior academics, and the research methods literature was much smaller and easier to master than it is now. We learned an enormous amount in the course of writing that first edition text; as has frequently been observed (originally by the physicist Frank Oppenheimer, according to Wikipedia), the best way to learn something is to teach it. As our careers have progressed, so has the methodological literature, which seems to have outgrown our own capacity (and probably anyone else's) to keep up with it. Such is its volume and complexity that it has seemed as big a task to produce this third edition from the second as it did producing the first from scratch. However, we have once again relished getting to grips with the new ideas ourselves and attempting to communicate them clearly to our readers.

Since the previous edition, there have been major changes in how information is accessed and processed, and in how research is conceptualized and conducted. Some of the most important additions or changes in this edition are systematic review methods and literature-searching methods (see Chapter 3), structured guidelines for appraising the research literature (see Chapters 3 and 8) and for preparing journal articles (see Chapter 8), modern psychometric methods (e.g., item response theory, see Chapter 4), guidance on choosing between different qualitative approaches (see Chapter 5), and the internet as a medium for conducting psychological research (see Chapters 6 and 10).

When we began updating the second edition to produce this one, we initially thought that we would completely revamp the references, as several had endured since the first edition and were written before many of our readers would have been born. We had a general "out with the old, in with the new," "let's clear out the attic" attitude. However, as the writing progressed, it quickly became apparent that many of the old references actually hold up rather well, several being classic papers that all clinical psychologists need to be aware of. So, while we have updated many of the citations, the end result represents what we hope is a judicious mix of ancient and modern.

The choice of title led to some debate among the authors and publishers. The first edition, which was entitled *Research Methods in Clinical and Counseling Psychology*, had its genesis in our teaching on clinical and counseling psychology courses. The second edition, entitled *Research Methods in Clinical Psychology*, focused on clinical psychologists as a primary readership, with counseling, health, educational, and community psychologists also being very much in our minds. The book should really be called something like *Research Methods in Clinical Psychology and Allied Professions*, but that is too clunky and unfocused. In our time, we have taught research methods to students and professionals in many other allied fields, including health, community, counseling, and educational psychology, psychiatry, speech therapy, and nursing. We want this text to be accessible to all of these audiences and more. We hope that potential readers from other disciplines will judge the book by the content not just the title—we intend it to be useful for not just clinical psychologists, but also for a broad range of mental health disciplines.

We have once again tried to make the text reader-friendly by having frequent bullet-point summaries of the important points in boxes, and a chapter summary and suggested reading at the end of each chapter. In this edition, we have added questions for self-reflection, also at the end of each chapter. Personal preferences are an often unacknowledged influence on the research that one conducts, and the questions for reflection are designed to help readers explore what they think and feel about the various approaches and issues that we have described in each chapter. We have also, as with the last edition, uploaded supplementary material for readers and instructors onto the book's website.

A few matters of grammar and style are worth noting. We have generally preferred vernacular to supposedly purist forms of expression. Thus, following recent trends, we have usually used the colloquial “they” to indicate a single person of unspecified gender, rather than the awkward sounding “he or she.” “Data” is treated as a collective noun either in the singular or the plural, as sense dictates, as in common speech. We are fully aware that it is a plural noun in Latin, but like “agenda,” also a Latin plural, it is frequently used in the singular in spoken English. We have also not hesitated to boldly split infinitives: the supposed rule prohibiting this practice now seems antiquated.

As with previous editions, we have tried to make this one relevant both to North American and to British readers. We are a transatlantic authorship team (one Brit, one American, and one who is both), although we are all currently working in the United Kingdom. Due to limitations in our abilities and experience, we have restricted most of our examples to the English-speaking world. However, we have taught research methods in other countries, and have had some instructive correspondence with our Asian, African, and Australian readers, so we hope that the book can be useful to readers outside of North America and the British Isles.

The first two authors are fortunate to work at University College London (UCL) in London's Bloomsbury district, which is probably the best place on the planet for library access. For this book, we have relied on three excellent libraries – the UCL library, the University of London Research Library, and the British Library – which are all within easy walking distance. UCL has provided us with an outstanding selection of electronic journals, the University of London Research Library has a superb

reference collection of psychology books for browsing, and the British Library is a magnificent public resource capable of supplying our every bibliographic want. Long may these institutions flourish!

Revising this book has also brought home once more what an excellent research methods education we three all received in our graduate school days at the University of California, Los Angeles. We were exposed to the full gamut of methodological options, by first-rate statistics and measurement instructors in the Psychology Department and innovative qualitative researchers in Sociology. This book is a tribute to all of our own instructors and mentors.

We are grateful to our many academic friends and colleagues—both past and present—in our own universities and our wider scientific circles, for inspiring us, keeping us up to date, and challenging us. We would also like to thank the following for their help with preparing the current edition. Several colleagues gave us suggestions or generously commented on chapter drafts: John Cape, Kate Cheney, James Coyne, Ravi Das, Allen Dyer, Peter Fonagy, Andy Fugard, Vyv Huddy, Zoe Huntley, Narinder Kapur, John King, Henry Potts, Tony Roth, James Schuurmans-Stekhove, and Francine Wood. Special thanks to Will Mandy for looking at several chapters at short notice. Marie Brown capably assisted with the library research, efficiently chasing up some of the more obscure references, and road-tested several parts of the text. Rachel Schön kindly assisted with the indexing. Shamil Wanigaratne and Sue Salas have been encouraging and supportive readers over three editions (and three countries). Our thanks to the team at Wileys: Andrew McAleer, who first encouraged us to undertake this rewrite, Karen Shield, our project editor, Amy Minshull, the editorial assistant, Nivedha Gopathy, the project manager, and Stephen Curtis, our eagle-eyed copy-editor. Thanks also to those who helped with previous editions: John Cape, Lorna Champion, Linda Clare, Michael Coombs, Neil Devlin, Jerry Goodman, Les Greenberg, Dick Hallam, Connie Hammen, Wendy Hudlass, Maria Koutantji, David Rennie, Laura Rice, Joe Schwartz, Pam Smith, and Mark Williams with the first edition, and Anna Barker, Chris Brewin, John Cape, Kate Cheney, Pasco Fearon, Dick Hallam, David Shapiro, Jonathan Smith, Lesley Valerio, and Vivian Ward with the second. And, finally, many thanks to all of our students, past and present, for their engagement with our teaching and supervision, and for continuing to keep us on our toes.

Even though we have benefited enormously from the advice and scrutiny of our colleagues and students, the responsibility for any residual errors remains our own. The process of preparing this edition has unearthed some minor mistakes in the previous one, and doubtless others still lurk herein. If you spot something wrong, please let us know, and we will post a correction on the book's website. We appreciate any feedback, positive, negative, or neutral, from our readers. We hope that this book will prove a useful resource in your own consumption or production of research, or in simply appreciating what a complex business it all is.

About the Companion Website

The companion website for the book, at www.wiley.com/go/barker provides supplementary material for readers, both students and instructors. For each chapter there are PowerPoint slides, questions for reflection, internet resources, and more.

1

Introduction: The Research Process

KEY POINTS IN THIS CHAPTER

- Research tells a story.
- Research raises questions as well as answering them.
- There is a vigorous debate within psychology about what constitutes legitimate research.
- This text takes a stance of methodological pluralism: of fitting the research method to the research question.
- The research process can be divided into four main stages: groundwork, measurement, design, and analysis/interpretation.

Research tells a story. Ideally, it resembles a detective story, which begins with a mystery and ends with its resolution. Researchers have a problem that they want to investigate; the story will reach its happy ending if they find a solution to that problem.

In practice, however, things aren't quite that simple, and the actual picture is closer to an adventure story, with many unexpected twists and turns. Often, the resolution of a research project is uncertain: it doesn't answer your initial research question, rather it tells you that you were asking the wrong question in the first place, or that the way that you went about answering it was misconceived. You struggle with discouragement and frustration; perhaps you come out of it feeling lucky to have survived the thing with your health and relationships (mostly) intact. So, if you enjoy research and are determined to make a contribution, you organize a sequel, in which you try out a

better question with a better designed study, and so it goes on. Another way of putting it is that there are stories within stories, or a continuing series of stories. Each individual research project tells one story, the series of projects conducted by a researcher or a research team forms a larger story, and the development of the whole research area a yet larger story. And this progression continues up to the level of the history of science and ideas over the centuries.

Another way that things are not so simple is that not all researchers agree on what constitutes a legitimate story. The situation in psychology is analogous to developments in literature. On the one hand is the traditional research story, rather like a Victorian novel, which has a clear beginning, middle, and end, and is expected to provide a more or less faithful reflection of reality. On the other hand, in this modern and postmodern age, we encounter narratives that do not follow an orderly chronological sequence or tie up neatly at the end. Furthermore, they may not claim to represent, or may even reject the idea of, reality.

These developments in literature and psychology reflect general intellectual developments during the last century, which have ramifications across many branches of European and English-speaking culture, both artistic and scientific. Our own field of interest, psychology in general and clinical psychology in particular, has been going through a vigorous debate about the nature of research – that is, which of these narratives we can call research and which are something else. Scholars from various corners of the discipline of psychology (e.g., Carlson, 1972; Driver-Linn, 2003; Gergen, 2001; Rogers, 1985; Sarbin, 1986) have questioned the validity and usefulness of psychology's version of the traditional story, which has been called "received-view" or "old-paradigm" research: essentially a quantitative, hypothetico-deductive approach, which relies on linear causal models. These and other critics call for the traditional approach to be replaced, or at least supplemented, by a more qualitative, discovery-oriented, nonlinear approach to research.

This debate, as Kimble (1984) pointed out, is a contemporary manifestation of William James's (1907) distinction between tough-minded and tender-minded ways of thinking, which is itself a translation into psychological terms of the old debate in philosophy over empiricism (Aristotle) versus rationalism (Plato). However, it is simplistic to view this debate as two-sided, with researchers being either in one camp or the other. It is better viewed as reflecting multiple underlying attitudes, for example, preferences for quantitative versus qualitative methods, attitudes towards exploratory versus confirmatory research questions, experimental control versus real-world relevance, and so on (Kimble, 1984).

One consequence of the lack of consensus about acceptable approaches to research is that people who are doing research for the first time may experience considerable anxiety – rather like the existential anxiety that accompanies a loss of meaning (Yalom, 1980). Undertaking a research project without being clear about what standards are to be used to evaluate it is an unsettling experience. Furthermore, there is a political dimension, since people in powerful positions in the academic world – journal editors, grant reviewers, and university professors – often adhere to the more traditional models.

This anxiety is exacerbated because the rules are not always made explicit, which may make beginning researchers feel, like Alice in Wonderland, that they are in a strange country with mysterious and arbitrary rules that are continually being changed. Researchers are constantly reminded, in various ways, to behave themselves properly in

accordance with these scientific rules; as the Red Queen said to Alice, “Look up, speak nicely and don’t twiddle your fingers all the time!” This experience can be understandably off-putting for people trying to enter the research wonderland for the first time.

We will reconsider these issues in Chapters 2, 4, and 5, which address the conceptual underpinnings of research. However, it is worth stating at the outset that our own stance is one of methodological pluralism. We don’t think that any single approach to research (or, indeed, that psychological research itself) has all the answers; thus, we believe that researchers need to have at their disposal a range of methods, appropriate to the problems being investigated. We have considerable sympathy with the critics of the received view, but are not convinced that the consequence of accepting their criticisms is to abandon traditional quantitative methods, or even research in general. Indeed, we feel that to do so would be a disaster for psychology and for society. Fortunately, we see increasing signs that it is possible to articulate a synthesis of the old- and new-paradigm traditions, that there are general principles common to rigorous research within whatever paradigm, and that it is possible to lay out an overall framework which organizes different approaches to research and clarifies the ways in which they can complement one another. Learning to do psychological research is partly a process of learning disciplined enquiry according to these principles within this general framework.

At the same time, there are rules of good practice specific to each type of research. We will base our methodological pluralism on a principle of appropriate methodologies (by analogy to the catch phrase “appropriate technology” in the economics of development). By this, we mean that the methods used should flow out of the research questions asked. Different questions lend themselves to different methods. To resume our literary analogy, like the different literary genres (mystery, romance, science fiction, autobiography, etc.), we can think of different research genres, such as survey research, randomized clinical trials, systematic case studies, and in-depth qualitative interview studies. Each of these research genres has different stories to tell and different rules of good practice.

We will attempt to clarify these general principles and specific rules of good practice, so that you will be in a better position to appreciate other people’s research. We hope that this will help you feel less intimidated about the prospect of conducting your own research. Also, there is value in making the rules of research explicit, so that one can challenge them more effectively, and thus contribute to the debate about how psychological research should be conducted.

Research is demanding: it does require clear and rigorous thought, as well as perseverance and stamina, but it is also fascinating and exciting, and, we hope, beneficial to the public that psychologists ultimately profess to serve.

The Research Process

This book is structured around a simple chronological framework, which we call the *research process*: that is, the sequence of steps that researchers go through during a project. The steps can be grouped into four major stages. Like all such frameworks, it is idealized, in that the stages are not always distinct and may interact with each other. However, we find it a useful way of thinking about how research is conducted, both one’s own and other people’s.

1. *Groundwork* (Chapter 3). This stage involves both scientific issues – choosing the topic, reviewing the literature, specifying the conceptual model, formulating the research questions – and also practical issues – resolving organizational, political, financial, or ethical problems. Sometimes researchers give the groundwork short shrift, being anxious to get on with the business of running the project itself. However, we will argue that devoting careful thought at this stage repays itself with interest during the course of the project.
2. *Measurement* (Chapters 4 to 7). Having formulated the research questions, the next step is to decide how to measure the psychological constructs of interest. We are here using the term “measurement” in its broadest sense, to encompass qualitative as well as quantitative approaches to data collection.
3. *Design* (Chapters 8 to 11). Research design issues concern when and from whom the data will be collected. For example: Who will the participants be? Will there be an experimental design with a control group? How many pre- and post-assessments will there be? What ethical concerns need to be addressed? These design issues can usually be considered independently of measurement issues.

The research questions, measurement procedures, and design together constitute the *research protocol*, the blueprint for the study. Having gone through these first three stages, researchers will usually conduct a small pilot study, whose results may cause them to rethink the protocol and possibly to conduct further pilots. Eventually the protocol is finalized; the last stage then consists of implementing it.

4. *Analysis, interpretation, and dissemination* (Chapter 12). The data are collected, analyzed, interpreted, written up, possibly published, and, let us hope, acted upon.

These stages in the research process constitute our framework for the book. However, we will also examine some key philosophical, professional, and political issues that are central to thinking about the whole research enterprise (Chapters 2, 4, and 5). Although following these arguments is not necessary for learning purely technical research skills, it is important to understand the wider context in which research is being conducted, as doing so will lead to more focused, coherent, and ultimately useful research programs. It is also important to keep in mind that doing research is much more than the exercise of a set of techniques; carrying out research involves imagination and empathy, problem-solving skills and critical thinking, and ethical reflection and social responsibility.

The first part of this background material is given in the next chapter, which analyzes the meaning of some of the terms we have so far left undefined, such as “research” itself. We will also discuss why anyone might want to engage in research at all.

Perspectives on Research

KEY POINTS IN THIS CHAPTER

- Psychological research is situated within philosophical, professional, personal, and political contexts.
- The process of psychological research is similar to that of open-minded enquiry in everyday life.
- Several philosophers have attempted to characterize the essence of scientific progress: Popper, Kuhn, and Feyerabend are central figures.
- Social and political forces shape the development of science.
- The scientist-practitioner model is a central part of clinical psychology's professional ideology, but there is often a gap between rhetoric and reality.
- Practicing clinical psychologists may choose to do research, or not to, for a variety of reasons.

This chapter examines some important background issues, in order to give a sense of the context in which research is conducted. These cover the “three P’s”: the philosophical framework (i.e., the underlying set of assumptions about the research process), the professional context (i.e., how research fits in to clinical psychology’s professional identity), and also the personal context (i.e., each individual researcher’s own attitudes towards research). In the background there is also the fourth P, the political context.

Understanding these contextual issues is helpful both in reading other people’s research and also in conducting your own. It helps make sense of other people’s research if you understand the framework within which it was conducted. If you are doing research yourself, it follows that the more you are aware of your assumptions, the more

you are able to make informed choices about what methods to use, rather than following available examples blindly (Elliott, 2008). This is similar to clinical work, where clients who have greater insight into their motivating forces are generally better able to live freer and more productive lives, and therapists who are able to step outside of their own perspective are better able to understand and help their clients (Rogers, 1975). However, again as in clinical work, making decisions can be hard work as you become aware of the multiple possibilities of action instead of making automatic choices.

The chapter has three sections, covering philosophical, professional, and personal issues. Political issues are touched on in all three sections.

PHILOSOPHICAL ISSUES

This section examines what is meant by two key terms: research and science. However, we need to start out with a couple of disclaimers. First, several of the ideas are complex and require philosophical expertise to appraise them properly. We do not possess such expertise, nor do we expect the great majority of our readers to. Second, grappling with difficult issues such as the nature of reality at this early stage can be heavy going. As is the case in all philosophy, there are more questions than answers. We attempt to give an overview of some interesting contemporary issues; it is not necessary to follow them in detail in order to conduct or critique research. However, having a broad grasp of them will help you understand (perhaps more clearly than the researchers themselves do) what a piece of research is attempting to achieve.

Philosophical issues that relate more specifically to psychological measurement (namely discussion of the positivist, phenomenological, and social constructionist positions) are covered in Chapters 4 and 5.

What is Research?

- Conducting research is essentially a circular activity (see Figure 2.1).
- Research requires psychological flexibility and open-mindedness.
- Research is not the only way to acquire psychological understanding: literature, life experience, and supervised clinical work are also important.
- The main reason for following rigorous research methods is to minimize bias and reduce errors in drawing conclusions.
- A rudimentary understanding of epistemology (the theory of knowledge) helps to elucidate some basic procedures and distinct stances towards research (e.g., critical realism and constructionism).

As Figure 2.1 suggests, the research process is a potentially everlasting circle. Our human propensity to understand ourselves and the world that we live in has been noted since ancient times. Plato had Socrates say (in the *Apology*, 38) that “the unexamined life is not worth living.” Some writers, for instance, Cook and Campbell (1979),

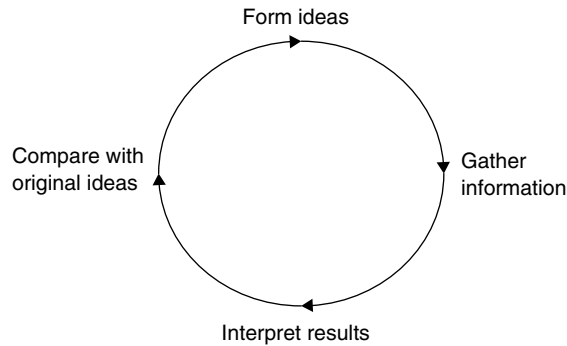


Figure 2.1 The research cycle

consider that the psychological roots of research have evolutionary significance: that there is survival value in our attempts to understand the world and ourselves.

Note that this circular model does not attempt to explain where we get our ideas from in the first place. There is a long-standing debate in philosophy and developmental psychology, which we will sidestep for the moment, about whether acquiring knowledge of the world is possible without some previous understanding. Our emphasis is on how educated adults discover and test ideas.

Research demands a degree of psychological flexibility, that is, an ability to modify one's ideas if they are not supported by the evidence. It may be helpful to view various sorts of disruptions in the circular model as corresponding to various maladaptive psychological styles. For instance, a refusal to interact with the world at all, elaborating theories without ever testing them against the "real world" (i.e., never moving down off the first stage of our circular model), is a solipsistic stance of building dream castles with no basis in reality – a stance captured in the epithet used to describe out-of-touch academics: "the ivory tower." This refusal to gather information also characterizes someone who is overconfident in the value of their ideas, and does not see any need to put them to any kind of empirical test. (Politicians often seem to fall into this category, with the result that many aspects of our society, such as education, the penal system, and health care, are largely determined by ideology rather than evidence.)

Problems in the lowest quadrant of the circle include biases in analyzing or interpreting the data: allowing what you want to get from a research project to distort how you report what actually happened. Our data are always influenced to some extent by our values and preconceptions; after all, these determine what we choose to study in the first place, what we count as data, what we select as important to report from amongst our findings, and inevitably the conclusions we draw about the world from our research. Indeed, Bayes's theorem holds that drawing inferences from research to the world is impossible without taking prior assumptions into account (Dienes, 2011). In extreme cases, however, researchers' personal circumstances or ideological commitments may lead them to ignore or suppress unwanted findings, or even to fabricate results (Pashler & Wagenmakers, 2012). While extreme cases of scientific dishonesty are probably rare, each of us is subject to self-deception, which may lead to distorting our results in subtle ways, the most common of which is simply dismissing our own or other people's results that don't fit our preconceptions.

Similar problems exist in the final step of the circular model: the refusal to modify one's ideas, because one dismisses or distorts the evidence, which characterizes a rigid, dogmatic stance. This can be seen in people who cling to various kinds of orthodoxies and fundamentalist beliefs in the face of contrary evidence. (Politicians often seem to fall into this category too!)

While passions and personal feuds make science more interesting, and have always helped drive it forward, we believe that curiosity and an inquiring, open-minded research attitude is one aspect of good psychological functioning. It is similar to Jahoda's (1958) concept of "adequate perception of reality" as one criterion for positive mental health.

Thus far, our characterization of research applies to everyday life as much as to organized science. We all do research informally; it is one way that we form our mental representations of the world. This is what Reason and Rowan (1981) call "naive enquiry." George Kelly (1955) elaborated the metaphor of the person as a scientist into an entire theory of personality: that people are continually building and testing their set of "personal constructs." However, cognitive and social scientists have also shown that people display pervasive biases in the way that they process information (Fiske & Taylor, 2013; Kahneman, 2011; Nisbett & Ross, 1980). The fundamental reason for the development of rigorous research methods is to attempt to minimize biases in drawing conclusions from evidence.

Finally, we should make it clear at the outset that we do not see research as being the only, or even an especially privileged, route to knowledge. One can learn much of relevance to psychology from the works of Shakespeare, Tolstoy, George Eliot, or James Joyce (to name a few of our own favorites). Great works of art or literature will often have a ring of truth that will immediately resonate with the viewer or reader. Furthermore, everyday life experiences also help build a knowledge base. In Morrow-Bradley and Elliott's (1986) survey of sources of psychotherapeutic knowledge, therapists reported that they learned most from experience with their clients, followed by theoretical or practical writings, being a client themselves, supervision, and practical workshops. Research presentations and research reports were ranked first by only 10% of the sample of practicing therapists (in contrast to experience with clients, which was ranked first by 48%).

However, the strength of formal research is that it is a systematic way of looking at the world and of describing its regularities, and it provides knowledge that can allow us to decide between conflicting claims to truth that may be put forward by rival proponents. New approaches to treatment are constantly being developed, and usually the person who develops the therapy will offer some preliminary evidence for its effectiveness. One example of a therapy that has gained widespread attention is multisystemic therapy (MST) for adolescent conduct disorders (Henggeler, Melton, & Smith, 1992). However, it has also attracted controversy about the quality of its supporting evidence (Littell, 2006), which has mostly been produced by the model's proponents. Until several rigorous studies have been conducted by researchers without a theoretical allegiance to the model, we will not be able to properly evaluate its effectiveness and mechanisms of action.

Furthermore, because research is a shared, public activity, it has a crucial role in contributing to the development of theory and professional knowledge. Interactions

with clients, conversations with fellow professionals, and personal growth experiences are all useful ways of educating oneself individually, but research, theoretical writings, and published case reports are public documents and therefore contribute to the development of the profession as a whole.

We will explore such professional issues more fully in the next section, and then, in the final section, discuss why individual psychologists might (or might not) want to do research. However, before we can do this, we need to examine the meaning of some of our core terminology in greater depth.

Definition of “Research”

The Oxford English Dictionary’s definition of “research” serves as a good working definition. It is: “A search or investigation directed to the discovery of some fact by careful consideration or study of a subject; a course of critical or scientific enquiry.” Five aspects of this definition are noteworthy.

First, the definition stresses the *methodical* aspect of research, that research is careful and disciplined. It is a craft that requires considerable dedication and attention to detail. There is also, however, a chance element to research: not all discoveries are necessarily planned and serendipity often enters in (Merbaum & Lowe, 1982). The classic example of an accidental scientific discovery is Fleming’s isolation of penicillin, when he noticed that some mold in a dish stopped the growth of bacteria he was attempting to cultivate. However, to take advantage of a chance discovery, the researcher must have the knowledge and insight to appreciate its significance, and then the persistence to follow it up. As Louis Pasteur, the microbiologist who invented the rabies vaccination is reputed to have said, “In the fields of observation, chance favors only the mind that is prepared” (O’Brien & Bartlett, 2012).

Second, the definition specifies a *critical or detached* attitude. This attitude is an important feature of the clinical psychology discipline. Clinical psychologists are trained to question the basis of professional practice, for example, “What’s going on here?”; “How do you know that?”; “What’s the evidence for that assertion?” This skeptical attitude does not always endear them to their colleagues from other mental health disciplines: it can at times lapse into rigid adherence to a narrow form of scientific practice (e.g., large randomized clinical trials), and may contribute to the common perception of psychologists as standing at one step removed from the other professionals in a team or service.

Third, the definition does not specify the method of research, suggesting the value of both *rational and empirical* investigation. While rational or conceptual research is sometimes denigrated in psychology as “speculation” or “armchair philosophizing,” it is essential in other disciplines, especially the humanities, and is the method of choice in mathematics (the “queen of the sciences”) and theoretical physics, both of which proceed from axioms to deductions. Psychology is primarily an empirical science, concerned with systematically gathering data, which are then used, in ways we will discuss below, to develop and test its theories. However, there is also an important role for conceptual research, to formulate theories, to explicate underlying principles, and to identify the assumptions underlying research (Slife & Williams, 1995). This issue of research method relates back to the centuries-old philosophical debate between rationalists and empiricists over the sources of human knowledge (Russell, 1961).

Fourth, the definition states that research is a process of *discovery*. This raises the distinction between exploratory research, which sets out to find something new, and confirmatory research, which sets out to evaluate existing theory (see Chapter 3). Philosophers of science make a similar distinction between the context of discovery and the context of justification of a particular finding (Reichenbach, 1938). We include both exploratory and confirmatory approaches under the definition of research, and see both as equally valid and useful.

Finally, the definition says that research is directed towards the discovery of *facts*. The Oxford English Dictionary defines a fact as “something that has really occurred or is the case.” However, this definition begs some difficult philosophical questions about how we come to know what is true, and requires some consideration of the philosophical basis of truth and knowledge.

Epistemology

The theory of knowledge is known as *epistemology*; it is the area of philosophy devoted to describing how we come to know things or believe them to be true or real. In fact, when psychologists talk about validity and reliability, in either quantitative psychometrics (see Chapter 4) or qualitative research (see Chapter 5), they are talking in epistemological terms. According to Hamlyn (1970; see also Packer & Addison, 1989), there are four fundamental epistemological positions, or criteria of truth:

1. The *correspondence theory* of truth, the basis of realist philosophies, holds that a belief is true if it matches reality.
2. *Coherence theory*, the basis of rationalist philosophies, holds that a belief is true if it is internally consistent or logically non-contradictory.
3. The *pragmatist or utilitarian criterion* holds that a belief is true if it is useful or produces practical benefits.
4. The *consensus criterion*, the basis of sociological theories of knowledge (see below), holds that a belief is true if it is shared by a group of people.

None of these theories is completely adequate: all have serious logical flaws. For example, correspondence theory involves an infinite regress, because reality must be measured validly before the degree of correspondence can be assessed. (This is referred to as the criterion problem in measurement.) Furthermore, counterinstances of each of the other three criteria can readily be imagined (e.g., an elegant, coherent theory which has no bearing on reality; a false belief which nevertheless proves useful; and a false consensus or collective delusion). On the other hand, all four theories have some value, as practical, but fallible guidelines (Anderson, Hughes, & Sharrock, 1986), suggesting the importance of a pluralist epistemology. Optimally, one would attempt to realize all four truth criteria in one’s research (cf. Elliott, Fischer, & Rennie, 1999).

Realism and Constructionism

Physical scientists often implicitly work from a *realist* position, which is based on a correspondence theory of truth. Realism posits that there is a real world out there, independent of whoever may be observing it (Bhaskar, 1975). Thus the rocks of the moon have a geological composition that is, at least in principle, discoverable: that

some people may believe the moon to be made of green cheese is irrelevant. Within this realist framework, the task of the scientist is to understand as accurately as possible the properties of the real world. Scientists themselves might say that they are trying to understand Nature.

For most of the past 100 years, psychologists have also emphasized a correspondence theory of truth, although in the latter half of the 20th century this evolved into a *critical realist* position (Cook & Campbell, 1979). This assumes that there exists a real world out there that has regularities. However, we can never know it with certainty: all our understandings are essentially tentative. The critical realist position emphasizes the replicability of research: that other researchers should be able to repeat your work and get approximately the same results, or in more technical language, that knowledge should be “intersubjectively testable” (Cook & Campbell, 1979; Popper, 1959). This means that researchers must be explicit about how they collected their data and drew their conclusions, so that other researchers can evaluate their conclusions or replicate the study themselves. Beyond this, it suggests that researchers should approach the same topic using different methods, with complementary strengths and weaknesses, a strategy of “triangulation” (Creswell, 2009; Tashakkori & Teddlie, 2009), a term taken from geometry and surveying. Thus, critical realists go beyond correspondence theory to include consensus and coherence truth criteria.

In the last two decades of the 20th century, various challenges to realist and critical realist philosophies emerged. These approaches emphasize either coherence or consensus theories of truth and try to eliminate correspondence criteria. The major current alternative to the critical realist position can be found in the various forms of *constructionism* and *constructivism*, some of which overlap considerably with *postmodernism* (Gergen, 2001; Guba & Lincoln, 1989; Neimeyer, 1993) and with *narrative* approaches (Bruner, 1991; Riessman, 2008). These are fairly imprecise terms, but they share a common stance of dispensing with the assumption of an objective reality and instead studying people’s interpretations or stories (see Chapter 5 for further discussion). Postmodernists are impatient with what they call “grand theory”; instead they present a more multifaceted, fractured world view, some taking the extreme point of view that there are no true and false stories, only different stories. The central problem with such radical constructionist or postmodernist views is that not all constructions or stories are equally interesting, consistent, replicable, shared, useful, or even accurate. That smoking causes lung cancer or that poverty reduces one’s quality of life, though not unassailable propositions, seem to describe important consistencies in the world.

Social constructionists emphasize the social construction of reality and see the research setting as a specialized form of social interaction, a situation for eliciting and studying people’s stories. They argue that researchers are not detached observers, but actively play a part in what they are studying and how they make sense of it (McGrath & Johnson, 2003). Thus, the collection, analysis, and interpretation of data involve processes of active construction. A related point is the interdependence of the knower and the known, which is emphasized by constructivists, like Piaget (1970), Vygotsky (1978), and Bruner (1987). That is to say, in coming to know a thing, both the state of our knowledge and the thing itself may be changed; what we call facts are a joint construction of the things themselves and our knowing process. For example, the

process of interviewing a client about her reactions to a recent therapy session may change both the way that the interviewer understands the process of therapy, and the way that the client feels about the session, her therapist, or herself.

Pure and Applied Research

There are many ways to classify research, for example, according to content, setting, population, or method. One important distinction is between basic academic research and applied (including evaluation) research. Although often presented as a dichotomy, the two positions are better thought of as two ends of a continuum (Milne, 1987; Patton, 2002).

Basic (or pure) research addresses the generation and testing of theory. What are the underlying processes that help us understand the regularities in nature? Basic research emphasizes processes common to most people. Because clinical psychology is an applied discipline, basic research is rare, but examples of research toward the basic end of the spectrum include the relative contributions of relationship versus technique factors in therapy outcome in general, and the neuropsychological mechanisms involved in recalling traumatic memories.

Applied research addresses practical questions, for example, whether a particular intervention works for a particular client group. At the far applied end of the spectrum is *action research* (Patton, 2002), carried out to address a particular local problem, such as the high dropout rate at a local psychotherapy service. *Evaluation research* also resides near the applied end of the spectrum, as it primarily addresses the general needs or outcomes of a particular agency or service, but may have a broader relevance. Evaluation is often motivated by pragmatic concerns, such as the need to maintain funding for a particular service. Although the methods used in pure and applied research overlap considerably, we will address some issues particular to evaluation research in Chapter 11.

In actual practice, pure and applied research blend into each other. As the above examples of pure research demonstrate, there is often an element of application in clinical research: that is what makes it clinical. Many examples of clinical research lie on the middle ground. For instance, psychotherapy outcome research addresses questions of both theory and application. Since we see the pure/applied distinction as a continuum rather than a dichotomy, we adhere to a definition of research that encompasses the full spectrum, and can even be extended to clinical practice (a point we take up later in this chapter).

What is Science?

We have used the word “science” up to now without questioning its meaning. Yet there is a lively debate about what science consists of, a debate that goes to the heart of some enduring controversies within psychology and related fields. It addresses the question of how knowledge is acquired and which methods of research are “scientific” (and therefore respectable). In a much-used example, how can we distinguish between legitimate science and voodoo or astrology? Or is such a distinction only a social construction? Closer to home, in what sense is psychoanalysis a science? Or, indeed, psychology in general?

Key points:

- There is a lively debate within psychology about which methods are scientific and which are not.
- Philosophers of science have attempted to define the unique characteristics of science.
- Induction is the process of deriving theories from careful observations. The central problem with induction is the theory-dependence of observation.
- Deduction is the process of making testable predictions from theories. It is the basis of the hypothetico-deductive model of science.
- Popper proposed that good scientific theories should be testable and therefore potentially falsifiable.
- Kuhn analyzed the historical progression of scientific thought in terms of his concepts of paradigms and scientific revolutions.
- The sociology of knowledge examines the role of social and political forces in the development of scientific thought.

The literature on this area is enormous: philosophy of science is an entire academic discipline in itself. Here we briefly review some central ideas. Since much undergraduate psychology education is implicitly based on a traditional view of science, it is important for psychologists to know about the positions presented here and in Chapters 4 and 5, in order to understand the context of the traditional view and to be aware of its alternatives.

Induction

An initial, common-sense way of attempting to characterize science is that it is based on careful observation, from which theories are then formulated. The derivation of theory from observation is known as *induction*, that is, going from the particular to the general. Astronomy is the classic example: astronomers gaze at the heavens, record what they see, and then try to spot the general pattern underlying their observations. Kepler's 17th-century laws of planetary motion were derived in such a way, using the accumulated data of his predecessor, Tycho Brahe. Within psychology, clinical observation also uses induction. For example, the psychoanalyst carefully observes a number of patients within the analytic setting, and then attempts to formulate his or her impressions into a theory. This was the basis of Freud's methods when he enunciated psychoanalytic theory at the beginning of the 20th century.

Unfortunately, there are two insuperable problems with induction as a guiding principle of science (Chalmers, 2013). The first is that it is impossible to have pure observations: what we observe and how we observe it are, implicitly or explicitly, based on theory. This phenomenon is known as the *theory-dependence of observation*. For example, a psychoanalyst, a Skinnerian behaviorist, and a lay person will notice very different things in a videotape of a therapy session. The second problem is that there is no logical basis for the principle of induction. Because something has been observed to happen on ten occasions, it does not necessarily follow that it will happen

on the eleventh. This means that theories can never be conclusively verified, only temporarily corroborated by scientific evidence, resulting in probabilistic rather than necessary truths. The philosopher, Karl Popper, who was a contemporary of Freud and Adler in 1920s Vienna, expressed this point of view forcefully. It is worth giving an extended quotation, which is of enduring relevance to psychologists:

I found that those of my friends who were admirers of Marx, Freud, and Adler, were impressed by a number of points common to these theories, and especially by their apparent explanatory power. These theories appeared to be able to explain practically everything that happened within the fields to which they referred ...

The most characteristic element in this situation seemed to me the incessant stream of confirmations, of observations which ‘verified’ the theories in question; and this point was constantly emphasized by their adherents. ... The Freudian analysts emphasized that their theories were constantly verified by their “clinical observations.” As for Adler, I was much impressed by a personal experience. Once, in 1919, I reported to him a case which to me did not seem particularly Adlerian, but which he found no difficulty in analyzing in terms of his theory of inferiority feelings, although he had not even seen the child. Slightly shocked, I asked him how he could be so sure. “Because of my thousand fold experience,” he replied; whereupon I could not help saying: “And with this new case, I suppose, your experience has become thousand-and-one fold.”

What I had in mind was that his previous observations I may not have been much sounder than this new one; that each in its turn had been interpreted in the light of “previous experience,” and at the same time counted as additional confirmation ... I could not think of any human behavior which could not be interpreted in terms of either theory. It was precisely this fact – that they always fitted, that they were always confirmed – which in the eyes of their admirers constituted the strongest argument in favor of these theories. It began to dawn on me that this apparent strength was in fact their weakness. (Popper, 1963: 34–35, reproduced by permission)

This quotation illustrates several important issues: (1) the limits of a verificationist approach (i.e., the approach taken by Adler of supporting his theory by looking for confirming instances) – good theories should be potentially capable of disconfirmation; (2) the problems of post-hoc explanation (it is easy to fit a theory to facts after the event); (3) the theory-dependence of observation (e.g., Adlerians tend to interpret everything in terms of inferiority complexes); and, finally, (4) the temptation for scientists to jump to conclusions without careful data gathering – Adler might have been more convincing if he had actually seen the child in question.

However, despite these major problems with induction, we are not suggesting that it be abandoned altogether, rather that it be conducted within a rigorous framework and complemented by other approaches, such as deduction and falsification. We will return to this in several subsequent chapters, especially in the section on systematic case studies in Chapter 9.

Deduction and Falsification

Having rejected the principle of induction as a sole, secure foundation for science, Popper attempted to turn the problem on its head: he looked at solutions based on