FOURTH EDITION

RESEARCH DESIGN IN COUNSELING

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RESEARCH DESIGN IN COUNSELING

Fourth Edition

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To my bright, inquisitive, and passionate students from whom I have learned so much; and to Mary, my loving partner and best friend for 46 years whose love and support have been so central to my life journey.

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Contents

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Preface

The seeds of great discoveries are constantly floating around, but they only take root in minds well prepared to receive them.

—Joseph Henry

So much of the field of counseling is discovery—discovering new techniques for helping people lead better, healthier, happier, and more meaningful lives. As Galileo said, "All truths are easy to understand once they are discovered; the point is discovering them." The counseling field is in many ways a new profession, and there are many truths left to be discovered. We are writing this book for the next generation of discoverers—those students and researchers who will enhance our professional skills to help more people at home and abroad. This discovery process is so critically important for the growth, health, and productivity of the specialty, as well as the next generation of practitioners and scholars who are the stewards of the profession. Moreover, critical scientific thinking is needed to extend our knowledge bases in counseling and counseling psychology; we need new scholars who can use the scientific method to further our understanding of the many complexities within human behavior across different cultural contexts. In this book we hope to provide a foundation to enhance students' scientific thinking and to help them make those discoveries.

There are several challenges in teaching the next generation of counselors and counseling psychologists to be inquisitive, passionate, and competent researchers. Perhaps first and foremost, many students learn about research methods in general research methods courses in education or psychology, which utilize what seem like very distant and even sometimes irrelevant examples from other disciplines. Subsequently, students in the counseling profession often do not see the utility, or full applicability, of research methods taught abstractly or apart from the typical domains of counseling research. We must teach research methods with meaningful examples for the next generation of counselors and counseling psychologists. In addition, when counseling students learn research methods when applied to, let us say clinical psychology or higher education, our students do not learn about the recent counseling literature and the creative approaches being utilized by contemporary scholars in our profession. Such a lack of knowledge and role models makes it difficult for counseling and counseling psychology students to even become aware,

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much less get excited about, the research topics within our profession. Although the book is not comprehensive of all research in counseling, it not only provides a strong foundation in research methods, but also provides students with a broad and impressive overview of many of the current research topics in the profession, along with many of our foremost researchers.

The fourth edition of *Research Design in Counseling* represents a substantial revision from the earlier editions. Because the first three editions were well received by students and faculty, we retained the basic content and style of coverage. However, this new edition reflects the work of five very well established authors in counseling and counseling psychology; Heppner and Wampold continue to provide the primary vision for this successful textbook, but now in collaboration with three very productive rising stars in our counseling profession. The combination of our areas of expertise provides a deep and rich conceptual understanding of research design from very productive researchers and scholars, with an emphasis on acknowledging the strengths and weaknesses of all the designs including quantitative and qualitative. Each chapter contains the most up-to-date information students need for utilizing the different research designs, as well as informative and concrete illustrations to enhance students' knowledge of research design and their application to the many exciting topics in our profession today. The book does not favor one design over another per se, but rather emphasizes the need to consider the type of questions being addressed, as well as the inherent strengths and weaknesses in the previous research literature. Moreover, each chapter has been revised and updated to reflect new information since the third edition.

The writing style of the book is aimed squarely at educating graduate students about the intricacies of both qualitative and quantitative research methods. Moreover, questions as well as applications of the material are highlighted in three different types of boxes (Research Journey, Research Application, and Research in Action)throughout each chapter to actively involve students in their education. Each chapter ends with a broad array of stimulus questions to enhance student learning and increase retention. We encourage the reader to use these questions to deepen awareness and understanding of each chapter. Through such reflection as well as talking with other students, both critical thinking skills as well as skills associated with designing rigorous research can become integrated more thoroughly into the way students think about important issues in the field.

We have dramatically reorganized the chapters into four major categories to help students organize the basic content areas needed to become an educated and skillful researcher. Part 1 consists of four chapters aimed at the philosophy of science, ethical issues within research, research training, and scholarly writing. It is critically important that students quickly comprehend basic philosophical and ethical issues pertaining to the role of science in creating strong foundational knowledge bases in our profession. For example, Chapter 3 on ethics provides a great deal of information about what students must know about ethical issues throughout all stages of their research. Science and ethics must go hand in hand, and this chapter offers many examples to illustrate this relationship. Moreover, Chapter 2 is totally devoted to graduate research training, and addresses the concerns and misconceptions about both science and research in counseling and counseling psychology.

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We not only highlight the current research on this topic, but also most importantly discuss the implications for students' development in acquiring research competencies. In addition, we are very pleased that the chapter includes stories from a diverse group of seasoned researchers who share critical aspects of their research journey. With openness and candor they share some of their own fears as well as joys along their path of becoming experts within their research areas. Chapter 4 focuses on professional writing, a critical skill for both scientists and practitioners. A great deal of research is being conducted, but good research questions and even well-designed studies often do not get published in our journals. Certainly good research questions and well-designed studies are necessary components, but strong writing skills are needed to accurately depict the study and explain the results. This chapter is aimed at helping students and researchers with the unique skills of scientific writing. We believe that more attention needs to be given to the process of writing, and how one acquires the skills to write scientifically, clearly, succinctly, and yet address important topics with heart.

Part 2 consists of six chapters all aimed at establishing the foundation for any particular study. Thus we focus on identifying and operationalizing topics of most interest to students, balancing ideals and realities when choosing a research design, and the central role of validity in conducting research. In addition, we focus on population issues and underscore that *who we study matters* in terms of the knowledge bases that we create, or do not create. For example, in Chapter 9 on diverse perspectives we discuss a number of conceptual and methodological considerations related to studying diverse populations throughout all phases of a research project in both U.S.-based as well cross-cultural or cross-national samples. This chapter has been greatly expanded and emphasizes a broad perspective that includes multiple identities and the intersection of identities. We have also greatly revised the other chapters to have a stronger emphasis on diversity issues to portray the increasing breadth of knowledge bases across populations, as well as the increasing complexities in the counseling profession. Finally, in Chapter 10 on scale construction we underscore the critical role of scale construction, and how we operationalize the constructs that are most central to our study. Our research can only be as strong as the measurement of our constructs. We encourage students to carefully consider the adequacy of the existing inventories to measure the constructs that are most important to them; most importantly, if we do not have an adequate assessment tool, we suggest that a good alternative is to take a step back, and develop a new scale to measure the construct of interest. This chapter also provides easy-to-follow guidelines and practical examples that guide the researcher toward the demystification of scale development, as well as those who want to understand more about the psychometric properties of existing inventories. In short, all of these chapters are aimed at helping students to provide a strong foundation for their study.

Part 3 provides an in-depth discussion of seven major designs. Our comprehensive coverage of research designs includes both quantitative and qualitative research, and single-subject as well as survey research. For example, Chapter 11 on true experimental designs discusses the power of these designs, most notably the power of between-groups and within-subjects designs. Moreover, Chapter 12 on quasi-experimental designs discusses relationships examined in applied settings, including

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longitudinal designs. Chapter 13 on quantitative descriptive designs discusses the utility describing, explaining, and predicting phenomena; this chapter also includes some of the latest thinking and writing about the importance of examining mediating and moderating variables, and provides information on the latest in all of the regression family designs. Statistical methods are also integrated throughout Part 3.

Although the strength of the book rests on the presentation of numerous intricacies of quantitative designs, the fourth edition also includes an updated and greatly expanded Chapter 16 on qualitative research. The chapter defines qualitative research and places it within constructivism and critical theory paradigms. The chapter describes three strategies of qualitative inquiry that have a great deal of applicability for counseling research: grounded theory, phenomenology, and consensual qualitative research. In addition, the chapter discusses common strategies to gather and analyze data, and also provides a wide range of references for further study with qualitative methods. In sum, this chapter not only provides a compelling need for qualitative research, but also provides detailed illustrations of most commonly used qualitative methods in counseling and counseling psychology, all of which provides students with an excellent introduction to qualitative methods. In addition, Chapter 17 on mixed methods designs provides not only a strong conceptual explanation of mixed methods (combining quantitative and qualitative approaches), but also includes several studies to illustrate the power of mixed methods.

Part 4 discusses a wide array of methodological issues, most notably a number of complexities surrounding the independent variable, as well as skillfully measuring intended outcomes with the dependent variable. In addition, we discuss methodological issues pertaining specifically to counseling outcome research, and provide the most up to date information regarding the effectiveness of counseling and psychotherapy. For example, Chapter 21 on process research focuses on the most recent research that examines the how's and why's of what makes counseling work. Chapter 22 on program evaluation applies science and practice to real-life programs that are designed to help a wide array of people. The field of counseling has increasingly become one that emphasizes intervention and social change at the program and systems level. Many counselors have jobs where conducting program evaluation and assessing the efficacy of interventions are a critical part of their position. This chapter offers many insights about the field of program evaluation and provides a great deal of information and support for researchers involved in assessing the effectiveness of programs and services. Chapter 23, the last chapter, focuses on a very important methodological topic, biases that create error variance from multiple sources, such as investigators, experimenters, and participants; most importantly, this chapter not only highlights biases, but also suggests ways to minimize their impact on our research.

We have so many individuals to thank for their contributions to this book. We especially want to thank the staff of Cengage for all of the technical support, patience, and help through this revision process; we very much appreciate the guidance of Julie Martinez who helped us through all phases of this book. Although a number of staff have changed over the years, the early vision of Claire Verduin lives on in this fourth edition, and she deserves special attention for her good judgment in developing the first edition of this book. In addition, we give a special thanks to

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the coauthors of several of the chapters, who added greatly to the depth and breadth of critical topics within research design: Drs. Germaine Awad, Matrese Benkofske, Kevin Cokley, Dong-gwi Lee, Hyun-Woo Lim, and Yu-Wei Wang. And another thanks to the researchers who have been willing to share some of their journey of becoming researchers; their voices added greatly to the discussion of the developmental process of becoming a researcher. In addition, we want to thank so many of you for sending in your comments about the book—how it was helpful to you and also where you would like more examples or suggestions.

Finally, we would like to thank all of the authors of the articles and books that we cite in this text; their dedication to conducting high quality research provides the profession not only with important new knowledge, but also with very helpful models on the "how to's" of conducting meaningful research.

As American folklorist Zora Neale Hurston commented, "Research is formalized curiosity. It is poking and prying with a purpose." We hope this text gives you many tools to "poke and pry with a purpose" and discover important truths for the betterment of humankind.

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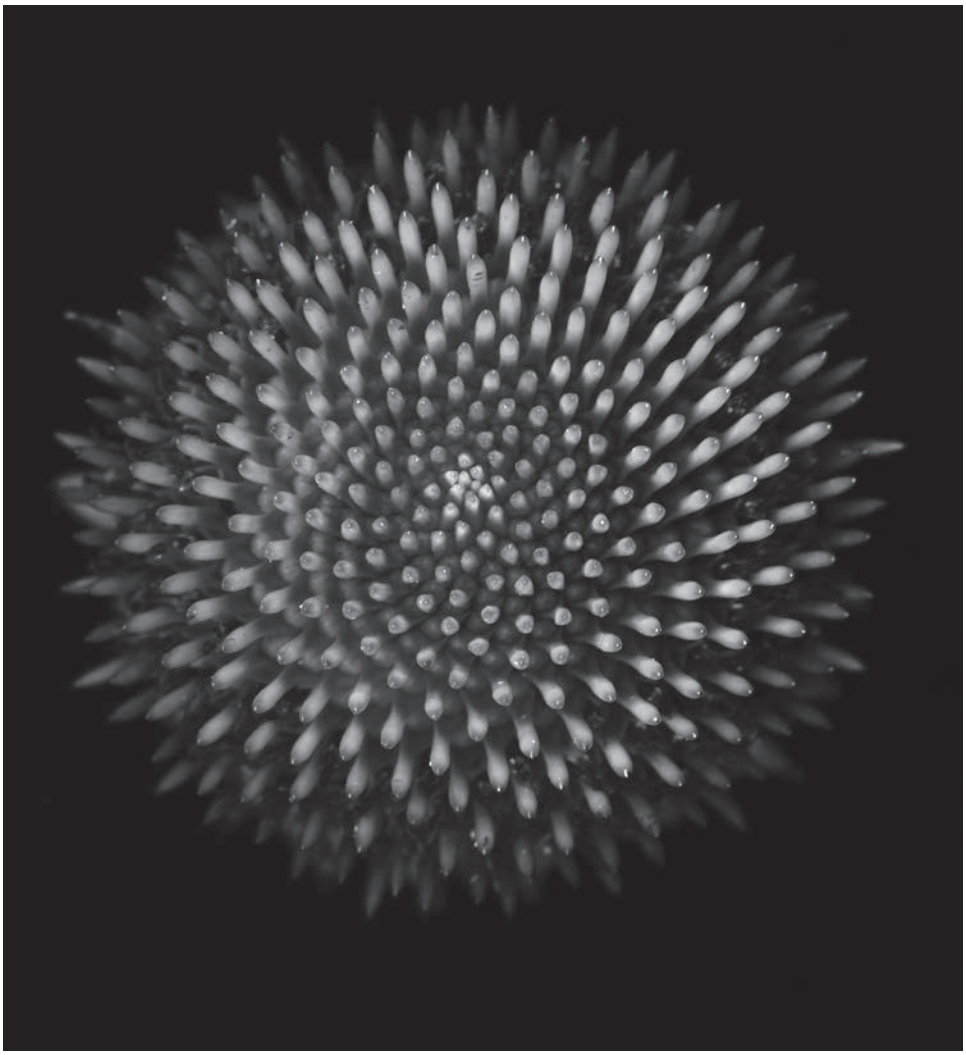
Part 1

PHILOSOPHICAL, ETHICAL, TRAINING, AND PROFESSIONAL ISSUES



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Chapter 1 Philosophies of Science and Counseling: Why Science Matters to Counseling

Counseling and counseling psychology are founded on the integration of science as applied to clinical practice—or the integration of science into practice and of practice into science (e.g., Benjamin & Baker, 2003; Packard, 2009). We live in an evidence-based world, and practitioners are expected to be knowledgeable of both evidence-based findings as well as our scientific methods in order to ensure that our practice is grounded in evidence. In today's world, counselors or psychologists whose practice is not evidence based puts both themselves and their clients at risk. In fact, many have claimed that practicing without scientific knowledge is inherently unethical (e.g., APA Presidential Taskforce on Evidence-Based Practice in Psychology, 2006; Baker, McFall, & Shoham, 2008).

Counselors and counseling psychologists assume responsibility for promoting the welfare of the people who seek our services and for protecting clients from harm (e.g., Lambert, Bergin, & Collins, 1977). As professionals, therefore, we must continually update and extend our knowledge about human nature, and consistently evaluate the efficacy of our interventions so as to ensure that our clients receive competent treatment. Consider the real-life example of a husband and wife who sought career planning assistance described in the following box.

RESEARCH IN ACTION 1.1

After a thorough intake, the individuals were assigned to a computerized career planning program. Both of them completed the program and were amazed to learn that they received exactly the same results. As Johnston, Buescher, and Heppner (1988) described:

> Careful checking of the program revealed that the program was reporting scores accurately for the first individual who used the program each day. The second, and all subsequent users that day, however, were getting an identical printout of the first user's

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> results. The first user's results continued to appear until the machine was turned off. In essence, every user, except the initial user each day, was receiving invalid results. For us, this resulted in many hours of calling clients to inform them that they had received invalid results. After expressing our shock to the manufacturer, we were told simply: "Oh, yes, we found that out a month ago and it has been fixed on new discs. We'll send you a new set." One wonders how many other career centers never found this error and continued to use a program that gave users blatantly invalid results. (p. 40)

This example involves a computer programming error that was not found through careful evaluation. Many other examples could be listed in which clients receive less than desirable treatments because of outdated information, ineffective or inappropriate counselor interventions, or erroneous knowledge about human behavior and the change process.

Scholars and practitioners (e.g., Heppner et al., 2000; Neimeyer & Diamond, 2001; Stoltenberg et al., 2000; Watkins, 1994) have both advocated for the continued integration of science and practice. Such an integration is needed not only so that practitioners maintain updated knowledge that they can integrate into their clinical work, but also so that researchers stay at the forefront of the pursuits of knowledge that are likely to be the most applicable to clients and to the general public. Wedding science and practice allows trainees and professionals to advance knowledge of the profession and conduct research that has the potential to directly affect social and policy agendas (Heppner et al., 2000; Krumboltz, 2002).

In this book, we will examine in depth the foundations of the scientific method and research design. The purpose of the book is to guide the reader through the fundamental aspects of research design with a core emphasis on the integration of science and practice. Moreover, throughout the book we discuss both the advantages and disadvantages of a wide array of research designs that are commonly used in counseling and counseling psychology. We guide the reader through the process of research, beginning with identifying topics, operationalizing variables, selecting a research design that best fits a particular research question, evaluating the results, and finally the intricacies of publishing one's research. Throughout, we discuss common errors, biases, and the complexities inherent in creating scientific knowledge across different cultural contexts. Finally, we utilize a wide array of published research in counseling and counseling psychology to illustrate not only different research designs, but also to concretely describe the complexities inherent in research.

In this chapter, we look at different sources of knowledge and introduce scientific inquiry as a mechanism by which to develop a dependable knowledge base for the counseling profession. We believe that it is absolutely essential to develop evidence-based knowledge on which to build the counseling and counseling psychology profession. We begin by reviewing four philosophical foundations of science

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and highlight the central role of theory in guiding our science and our practice. In addition, we emphasize the integration of science and practice as a foundation of graduate training programs in counseling and counseling psychology; moreover, we highlight the critical role of scientific or critical thinking as a central outcome of graduate training, and in essence, as a major goal of this book.

SOURCES OF KNOWLEDGE

Charles Peirce, a 19th-century American mathematician, philosopher, and logician, stated that there are at least four ways of knowing, or of "fixing belief" (Buchler, 1955). The first method is the method of tenacity, or the notion that whatever belief one firmly adheres to is truth. These "truths," therefore, are known to be true because we have always known them to be true and the frequent repetition of these "truths" seems to enhance their validity (Kerlinger & Lee, 2000). A second method of knowing is the method of authority, which can be human (e.g., the president of the United States, a well-known psychologist) or superhuman (e.g., God, a higher power). In other words, if your clinical supervisor (an authority figure) says that it is so, then it is "truth." A third method of knowing is the a priori method, or method of intuition (e.g., Cohen & Nagel, 1934). Accordingly, if something makes sense and has previously been believed to be true, then it is indeed true. The fourth method of knowing is the scientific method, which involves empirical tests to establish verifiable facts. A fifth way of knowing not included in Buchler's conceptualization is knowledge learned through one's direct experiences in the world. Through countless experiences, each individual construes a "reality" of the world; some of the individual's perceptions may match those of others with similar experiences, whereas some may be different.

Given the overwhelming complexity of life and the vast amounts of knowledge needed even in daily living, people most often acquire "truths" through all five of these ways of knowing. In his annual philosophical lecture read before the British Academy, On the Sources of Knowledge and of Ignorance, Popper (1962) argued that there are a variety of sources of knowledge, but all are prone to error. He reasoned that our mission should be to detect and eliminate error by "criticizing the theories or guesses of others and—if we can train ourselves to do so—by criticizing our own theories or guesses." (p. 26). Reliance upon any one type of knowledge without critique and analysis can be dangerous. Individual biases can develop based upon a limited information and experiences can be distorted, which in turn can lead to inaccurate conclusions. We must, therefore, keep in mind that error can be involved in any of the five ways of knowing.

SCIENCE AS A WAY OF KNOWING

Science, as derived from Latin, means knowledge. The true meaning or definition of science, however, has long been disputed and numerous perspectives exist. Ziman (1968) captured this well in his statement: "To attempt to answer the question 'What is Science?' is almost as presumptuous as to try to state the meaning of Life

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itself." (p. 1). Science represents one of a variety of perspectives (e.g., philosophy, religion, art, literature, mythology) and sources of knowledge (Buchler, 1955) in its attempt to describe and explain human nature.

According to Pedhazur and Schmelkin (1991), science is perhaps best distinguished from other descriptions of human nature by the methods used to arrive at answers. Popper's opening statement in *The Logic of Scientific Discovery* (1959) described the scientist as follows:

> A scientist, whether theorist, or experimenter, puts forward statements or systems of statements, and tests them step by step. In the field of experimental sciences, more particularly, he [sic] constructs hypotheses, or systems of theories, and tests them against experience by observation and experiment. I suggest that it is the task of the logic of scientific discovery, or the logic of knowledge, to give logical analysis to this procedure; that is to analyze the method of empirical sciences.

In this way, Popper described the tasks and methods of the scientist. He argued against Hume's deductive perspective (or perspective that general rules hold and it is our job to uncover these rules) by suggesting that science is also inductive (i.e., conclusions drawn from science are probable rather than absolute). Popper also questioned Kant's positivist perspective by suggesting that knowledge is never determined as finality, but rather that it can and should be continuously subject to additional testing and possible refutation.

More recent descriptions of science, and the scientific method, extend the perspective held in the early-to-mid 1900s, which described scientists as objective observers who were both methodical and detached in their use of the scientific method to uncover "truth." For example, Lakatos (1976) subsequently extended Popper's theory of knowledge in its application to mathematical theorems. Specifically, Lakatos claimed that no theorem is final or perfect, but rather that no counterexample has yet been discovered. As such, he argued that knowledge must accumulate with time, evidence, and instances of contradictions. In other words, he argued for a programmatic view of research and of the development of knowledge over time.

We believe that maintaining a critical attitude or reasoning (i.e., critical inquiry) is an essential component of being a scientist. Scientific inquiry is understood to be a critical attitude toward findings and interpretations based upon the findings. Indeed, scientific inquiry is perhaps best described as a never-ending process of successive approximations in which the scientist has a tolerance for ambiguity, a willingness and ability to question, and an ability to entertain competing answers, and conduct empirical tests among them.

In essence, the scientist uses the scientific method, or a set of assumptions and standardized rules about collecting and evaluating data, in an effort to reduce bias and develop credible "ways of knowing." Collecting data allows investigators to put their ideas to an empirical test. The basic functions of the scientific approach are twofold (e.g., Kerlinger, 1986; Kerlinger & Lee, 2000). The first is to advance knowledge, make discoveries, and learn facts. The second is to establish relations among events and develop theories, thereby helping professionals to make predictions of future events.

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PHILOSOPHICAL FOUNDATIONS OF HUMAN BEHAVIOR

Philosophical foundations guide our understanding of the world and affect the methods by which scientists conduct research. We will briefly discuss four philosophical underpinnings of research: positivism, postpositivism, constructivism, and critical theory. Although these four philosophical underpinnings are often discussed as distinct philosophies, it is important to understand that two or more paradigms often "interbreed" (Lincoln & Guba, 2000, p. 146) and the boundaries among these perspectives are in constant flux. With this caveat, we will present a brief discussion of four paradigms according to assumptions across three dimensions (ontology, epistemology, and methodologies—see Table 1.1).

Positivism

Positivism is the paradigm that most closely depicts the scientific method as traditionally taught in the physical sciences. According to this paradigm, the nature of the universe can be known and the scientist's goal is to discover the natural laws that govern objects in the universe. For example, physical laws that describe gravitation, magnetism, and electricity may be considered as statements about the universe that are universal in terms of both time and context. A key principle is that "truth" exists, and given time, brilliance, and sophisticated methods, discoveries will be made that illuminate the truth. In the positivistic realm, the scientist is "objective." In this way, the scientist neither affects the world that is studied nor is affected by world under investigation. A given experiment is expected to lead to the same outcome and conclusion, regardless of who conducts the experiment. In the end, the data yield results that are self-evident to the scientific community and confidence in results derives from the scientific method rather than from the scientist.

The scientific method involves well-defined steps. First, the scientist makes a conjecture about the nature of the universe. Next, the scientist designs an experiment such that its results will either confirm or disconfirm the conjecture. Knowledge is contained only in statements based on or linked to direct observation. If the data conform to the prediction, the conjecture is verified. If the data do not conform to the prediction, then the scientist concludes that the phenomenon being studied does not follow the conjecture. Positivism is often characterized as a hypothetico-deductive process. In other words, deductions are derived from testing hypotheses.

There are other important characteristics of positivistic research. First, relations typically are expressed in terms of causality—X causes Y. Second, theories are reductionistic such that complex processes are understood by being broken down into simpler subprocesses, which can be studied more easily. Third, laws are usually expressed mathematically, measurements are quantitative, and conclusions are dichotomous (either the data conform to the prediction, or they do not). According to positivism, human nature is lawful, the accumulation of facts or knowledge will result in conclusions regarding whether a law is true or not true, and the goal is to identify causal relationships among variables. This contributes to the overall goal of science: to develop theories of human behavior, which consist of a network of knowledge statements that are grounded in observation and tied together by deductive logic.

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TABLE 1.1 Major Tenets of Philosophical Underpinnings

	Ontology	Epistemology	Methodology
	The nature of reality	The relationship between the inquirer and the known	Processes for gaining knowledge of the world
Positivism	There is a "real" reality Truth exists and can be known Dichotomous conclusions are possible	The scientist is objective The scientist does not affect the research and is not affected by it	Scientific method Hypothetico-deductive process Absolute truth can be uncovered Linear
Postpositivism	There is a "real" reality Truth can never be fully known Dichotomous conclusions are not possible because systems are complex	All research is flawed The scientist has biases that may affect the research	Scientific method Hypothetico-deductive process Linear Reliance upon inferences based on probability
Constructivism	There is no "real" reality or absolute truth There are no conjectures or tests of conjectures Ideas about the world are constructed in the minds of individuals Perceptions are reality	Constructions can only be understood via interactions between (a) the investigator and the participant or (b) between the investigator and the world of the participant	Reliance upon hermeneutics as data Dialectics (interactions between the participant and the investigator) are critical to the interpretation of data Recursive
Critical theory	Social constructions are shaped by social, political, cultural, historical, and economic forces Social constructions results from power structures that have become embedded within a societal context over time	Social constructions are deeply embedded in the investigator and the participant The values of the investigator are vital to the inquiry The investigator and the participant form a relationship	Constructions are refined or altered via the process of interpretation Interpretations facilitate social action designed to emancipate from oppression Dialectism is used to alter constructions Recursive

Postpositivism

Postpositivism shares with positivism the belief in a "real" reality and the goal of discovering "truth." Postpositivists, however, recognize that truth cannot be fully known and

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that (at best) we make probabilistic statements rather than absolute statements about truth. For example, the statistical models that underlie research in the social sciences are saturated with this probabilistic interpretation. The values of p associated with statistical tests represent probabilities, given the assumption that the null hypothesis is true. Statistical tests assert that we can never conclude with certainty that our results can differentiate among competing hypotheses. When we reject the null hypothesis (i.e., obtain a statistically significant result), we decide to accept the alternate hypothesis knowing that there is a small probability that we made the wrong conclusion. In addition, because postpositivism is characterized by a belief that absolute "truth" cannot be known, the logic of the positivistic scientific method is altered. In the postpositivistic paradigm, theories lead to conjectures, and the statements about truth are altered to recognize that the inferences are probabilistic. If the data are consistent with the conjecture, then confidence in the theory as an accurate description of "truth" is increased.

The term *corroborated* is often used to indicate that a study produced results consistent with prediction and that the conjecture has survived another test. If, however, the data are inconsistent with theoretically derived conjectures and the study is valid, then the theory has failed to be corroborated. A succession of studies that fail to conform to prediction would constitute evidence that the theory should be revised or abandoned. The goal in postpositivistic research is to produce, through a succession of experiments, descriptions that are closer approximations to the truth. For example, to prove that smoking leads to various detrimental health outcomes, multiple experiments of various types (e.g., passive designs, experimental designs using lab animals) were needed.

Postpositivism also recognizes that there is error and bias in the scientific process. For example, classical test theory rests on the proposition that any observed score represents "true score" (or the true amount of a characteristic that a person possesses) plus error. We acknowledge that random error renders our assessment of any construct imperfect. In addition, postpositivists recognize that all research is flawed and that bias has the potential to affect all research. Finally, there is recognition that the researcher may affect the research process. Truths, therefore, are not considered to be self-evident but rather must be arbitrated by the scientific community. The process of peer review is an admission that the validity of a conclusion is open to interpretation and that it is scientists' opinions about the veracity of a claim that dictate whether or not a result adds to the cumulative knowledge of a field.

Constructivism

In the constructivism paradigm, notions of "truth" and "reality" are abandoned in favor of the belief that ideas about the world, particularly the social world, are constructed in the minds of individuals. Constructivists recognize that these constructions are based on the experiences of individuals as they interact with the physical and social environment, are shaped by cultural context, and may be idiosyncratic. Constructions can be simple or complex, naive or sophisticated, uninformed or informed, but they cannot be proven true or false.

Constructivists believe that the meaning attributed to the event by the participants of the system, rather than the event itself, defines reality. Suppose that we consider the example of an individual who has been bullied. Constructivists recognize

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the reality of the event, but then argue that it is the meaning that is attributed to that event by the individual that is important in determining social relations and behavior. Because social constructions are developed through interactions with the environment and involve mental representations and interpretations of those interactions, the investigator and the participant(s) are linked. A participant's internal constructions, therefore, can only be understood via interactions between the investigator and the participant or the interaction between the investigator and the world of the participant.

Constructivists use hermeneutics and dialectics to facilitate understanding of the participant's constructions. Hermeneutics refers to the activity of interpretation of data (e.g., language, behavior, text, artifacts, other aspects of human behavior or thought). Constructivists use these data to develop an interpretation that is a description of the constructions of the participants. Constructivists also attend to dialectics, or the interactions between the participant and the investigator, in their interpretation of data. At the most basic level, the interaction is a conversation in which words are exchanged and interpretations of language contributes to an understanding of constructions. At the next level (which is more commonly associated with critical theory), the exchange involves discussing these constructions (e.g., an investigator shares her or his interpretations with the participant). At the last level, dialectics involve refining or altering constructions based upon the process of interpretation.

In the constructivist paradigm, there can be no conjectures (i.e., predictions based upon hypothesized truths) or tests of conjectures. Data are not collected with the aim of determining whether or not observations are consistent with conjecture. Rather, data lead to interpretations that then lead the investigator in directions that may not have been anticipated. The investigator subsequently may reinterpret data or collect additional data that may have been unimaginable when the investigation began. Constructivist and critical theorists (discussed next), therefore, recognize that methods are recursive (i.e., the results and method influence each other).

Critical Theory

Critical theory posits that people's social constructions are shaped by the social, political, cultural, historical, and economic forces in the environment that often have been created by individuals who were in positions of power. Over time, the constructions take on the appearance of reality such that the social reality grown out of the social context is assumed to be truth. Because the constructions are so deeply embedded in society (including in researchers themselves), it can be extremely difficult to comprehend that these constructions were spawned in the societal context and are not truths. For example (and any examples chosen are necessarily controversial), the belief that the monogamous union of one male and one female for the purpose of reproduction (i.e., heterosexual marriage) is "natural" is a socially derived position. Critical theorists would concede that marriage is necessary and important for the social order (as we know it), but they would contend that marriage, as an institution, was generated by the social system. They would argue that there are alternatives (e.g., same-sex unions, polygamous marriages) and that the "truth" of any "natural" propensity to marry is unfounded.

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In critical theory, the investigator and the participant form a relationship, and the values of the investigator are vital to the activity. Inquiry involves the level of dialectism that changes constructions (i.e., the third level mentioned previously). That is, the investigation involves a dialogue between investigator and participants in such a way that the participants come to realize that their understanding of the world is derived from the precepts of the social order, and that these precepts can (and should) be altered. In other words, a goal of critical theory is to facilitate individuals' realization that constructions are socially constructed beliefs rather than unchangeable truths. Through this process, the dialectic leads individuals to understand that social action is needed to change the social order so as to facilitate emancipation from oppression (e.g., racism, classism, heterosexism, sexism).

Scholars have argued that "no single critical theory" exists, but that there are some "commonalities among the variants of critical theory" (e.g., Ponterotto, 2005b, p. 130). For example, feminist theory can be considered within the critical theoretical realm in that it contends that traditional roles for women have been socially determined, that the power in society has been allocated to men, and that these social realities can be altered. One goal of feminist theory is to raise the consciousness of individuals so that individuals come to recognize the historical context that led to the current social situation and subsequently move toward rejecting traditional roles and norms. Some critical theorists would contend that this worldview involves more than social action, which tends to change society at the margins, and instead necessitates radical change that dramatically replaces current social structures with others.

Summary of the Philosophical Foundations

Philosophers, since the beginning of humankind, have wrestled with ideas about knowledge and knowing. It is impossible (or irrelevant) to "prove" that one of the four paradigms is correct, more appropriate, better, or more useful than another. Each paradigm has different systems for understanding the world but no method, either logical or empirical, can establish the superiority of any given foundation. The debate over the philosophy of science is exceedingly complex and intertwined with our view of human nature, the adequacy of our research methods, the content of our research investigations, and the perceived utility of our research findings. Nevertheless, it is vital to understand the philosophical foundations of various paradigms to ensure that the research approach is appropriate for the question. Some (e.g., Morrow, Rakhasha, & Castañeda, 2001) have recommended that researchers select paradigms in accordance with an understanding of belief systems, values, personality, and knowledge of research design.

SCIENTIFIC METHOD AS APPLIED TO COUNSELING AND COUNSELING PSYCHOLOGY

The scientific method provides a mechanism to contribute to knowledge that is credible, reliable, and effective. This knowledge, in turn, is applied to work with individuals to facilitate growth and positive change. Within the field of counseling,

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the goal of the scientific method is multifaceted and is to advance knowledge, make discoveries, increase our understanding of human behavior, and use knowledge to solve practical problems. Because phenomena of interest in the realm of counseling include both observable events as well as subjective and self-reported experiences, researchers examine a range of phenomenological or self-report variables.

Not surprisingly, many counseling scholars argue that the adequacy of our research can be evaluated by how relevant the findings are for practitioners and for the public (Krumboltz & Mitchell, 1979; Zimbardo, 2004). Scientific research can advance our knowledge base or understanding of human behavior by providing data that describe and help us understand a wide range of human behaviors. This understanding contributes to an ability to alter such behaviors via counseling, advocacy, and consultation interventions.

The expansion of knowledge in the counseling profession is guided by pressing societal needs as well as by questions or problems that arise in our professional work. For example, a pressing question is whether the effectiveness of psychotherapy is related to common factors or specific ingredients (e.g., see Wampold & Imel, 2015). Our research is also guided by current societal needs that merit immediate attention, such as social advocacy and social justice for marginalized groups (for more details see Speight & Vera, 2003; Toporek, Gerstein, Fouad, Roysircar, & Israel, 2005; Toporek, Kwan, & Williams, 2012). For example, the increased national and international attention to immigration and the effects of recent legislation have spurred the development of an emerging body of research relevant to the counseling profession (see Yakushko & Morgan, 2012).

A common defining element of the counseling profession is that we conceptualize a person's behavior as a function of the environment (Fretz, 1982). People do not think, feel, or behave in isolation, but rather in the context of a rich personal and social history. Research that increases understanding of how individuals interact within a broader social and personal environmental context is crucial to the development of knowledge about counseling. A goal of science, therefore, is to expand our knowledge about interactions between individuals and a larger personal, social, cultural, and historical context. Ignoring these contexts ignores critical elements in understanding current behavior and can lead to ineffective or inappropriate interventions and unethical behavior (American Psychological Association [APA], 2003; Toporek, Kwan, & Williams, 2012).

There are costs to acquiring knowledge by using the scientific method. Empirical investigations are costly in terms of time, energy, and resources. Putting complex and internal cognitive and affective processes to empirical test is a difficult and elusive task. Sometimes when we try to identify specific processes or variables we become mechanistic and lose the gestalt, or whole picture. The lack of sophistication of our research methods may result in conclusions that tell us little about real-life processes. Further, relying upon culturally homogeneous samples or on theories based on majority culture to draw conclusions can lead to inappropriate interpretations and harmful consequences to individuals who are members of underrepresented groups.

Despite these challenges and limitations, we argue that the risks of building a profession on nonscientific evidence are far greater. As such, the knowledge on

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which the profession is built must be based on objective or verifiable information that can be put to empirical or quantifiable tests. In this way, the methods used to establish our "truths" have a built-in self-correction process; each empirical test is independent of previous findings and can either verify or disconfirm the previous knowledge.

In summary, the knowledge of a profession must be empirically based and verifiable rather than subjective and untestable. Even though the scientific method has costs and is not problem-free, building a helping profession without it is too risky. The credibility of the counseling profession would be significantly challenged without a strong scientific foundation and reliance upon theory to guide our research and interventions.

THE ROLE OF THEORY IN THE COUNSELING PROFESSION

Theories seek to establish general relations and conditional statements among events that help professionals to understand phenomena. Theories are relevant to science in that they provide a mechanism by which to organize and understand explanations for the dynamics that underlie a given psychological phenomenon (Karr & Larson, 2005; Strong, 1991). Theories also guide our practice by providing us with the tools to conceptualize human behavior and develop testable hypotheses to apply to our work with clients.

Another critical role of theory in science is that theories provide a foundation for hypothesis development and testing (Tracey & Glidden-Tracey, 1999). De Groot (1969) defined a theory as "a system of logically interrelated, specifically noncontradictory, statements, ideas, and concepts relating to an area of reality, formulated in such a way that testable hypotheses can be derived from them" (p. 4). In this way, theories function as a foundation from which scientists understand logical inferences and develop testable hypotheses (Forster, 2000; Karr & Larson, 2005).

Although it is exceedingly difficult to develop broadscale theories aimed at predicting human behavior, it is useful for counseling professionals to organize facts and knowledge into theoretical frameworks that can be used as ingredients within more complex and conditional models of behavior. Theoretical frameworks that consist of sets of conditional statements that can be qualified by specific information about an individual allow both the needed specificity and complexity in explaining and predicting individuals' behavior. In this way, theory drives our science and practice, and our science and practice explicate theory. We discuss both of these functions next.

Theory-Driven Research

Many scholars highlight the importance of conducting research that is theory driven. For example, Meehl (1978) advocated for the usefulness of theory to guide researchers to ask meaningful questions and Strong (1991) suggested that theory provides a way to avoid falling into the trap of a "generation of a multitude of unconnected facts" (Strong, 1991). Theory-driven research involves a process

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whereby theory is used to guide the development of hypothesis generation, which leads to testing and observations. Findings obtained from data are subsequently interpreted through the context of discovery (Strong, 1991). In this way, research explicates and refines theory. Attending to theory and viewing science as a continuous accumulation of knowledge (Kline, 2009) is consistent with Lakatos's (1976) value of science as programmatic. Indeed, we argue that theory development, specification, and refinement are central goals of the scientific endeavor: little is more useful than a solid theory!

Concerns regarding the status of theory-driven research in counseling have been raised. In their review of the literature from three major counseling journals from 1990 to 1999, Karr and Larson (2005) demonstrated that less than half of the sampled empirical quantitative studies published in *Journal of Counseling Psychology*, *Journal of Career Development*, and *Journal of Vocational Behavior* met their criteria for consideration as theory-derived research. These authors concluded that 57% of quantitative empirical research published at this time lacked a theoretical or conceptual framework.

One area of counseling research that has been noted for its theory-driven approach is vocational psychology. For example, Holland's hexagon of career interest areas (i.e., RIASEC) has generated a large body of empirical research since its inception (Swanson & Gore, 2000). Consistent with the cyclical process of theory-driven research, Holland's RIASEC has been tested over time and has been extended and refined according to tests of its structure of interests across cultures (e.g., Wilkins, Ramkissoon, & Tracey, 2013; Zhang, Kube, Wang, & Tracey, 2013).

Theory-Driven Practice

Theory-driven research also allows counseling professionals to ensure that they are engaging in interventions with individuals that are theory driven. This allows us to ensure that our counseling interventions are informed by, and grounded in, scientific evidence. Theories of psychotherapy offer a framework from which to explain the characteristics and progression of psychological phenomena for clients that informs counseling professionals' approach to treatment.

Pepinsky and Pepinsky (1954) articulated a prescriptive model of counselor thinking based on the scientific method. Strohmer and Newman (1983) summarized their model in this way:

> The counselor observes the client, makes inferences about his or her current status and the causal inferences, and then, based on these inferences, makes a tentative judgment about the client. The counselor then proceeds in an experimental fashion to state the judgment as a hypothesis and to test it against independent observations of the client. Through a series of such tentative judgments and tests based on these judgments, the counselor constructs a hypothetical model of the client. This model then serves as the basis for making predictions (e.g., which treatment approach is most appropriate) about the client. (p. 557)

In essence, Pepinsky and Pepinsky (1954) suggested that the counselor incorporate a scientific or critical thinking model by (a) generating hypotheses based on (b) the

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data that the client presents, followed by (c) empirical testing of the hypotheses, to develop (d) a model that can be used (e) to make predictions about the client. The essence of this approach is that it is *data based* or *empirical,* which lessens the chance of personal biases or subjectivity.

Since Pepinsky and Pepinsky's early writing, many others have offered approaches to clinical work based on the scientific method (e.g., Stricker, 2007). Evidence-based practice policies, by their very nature, require that psychotherapists' practice be grounded in theory and research (APA Presidential Task Force on Evidence-Based Practice, 2006). One of the hallmarks of our profession that highlights the integration of science and practice is that of psychotherapy outcome research. Specifically, this research seeks to answer the question: How do we know that our interventions are effective? This question has led to a large body of research that has sought to identify the interventions, therapeutic effects, common factors, and mediating contextual factors that contribute to positive client outcomes (e.g., Wampold & Imel, 2015). The accumulation of evidence from these data has demonstrated that merely relying upon a person's (such as your clinical supervisor or instructor) opinion about which interventions, under which conditions, lead to effective outcomes is insufficient. Instead, we must rely upon sound research methods to build the *knowledge* upon which the counseling profession is based.

In summary, theories have an integral role in the science and practice of the counseling profession. We all have theories, and these theories inform our perspectives as researchers and practitioners. In this book, you will learn how to examine theories, test theories, and develop theories (e.g., grounded theory). But most importantly, it is this combination, or the integration of science and practice, that is a foundation of our profession.

Science and Practice Integration

The integration of science and practice is a foundation of graduate training programs. The basic assumption is that students trained in both science and practice will be better prepared as professionals, regardless of where a particular job falls on the science versus practice continuum. Students entering a graduate training program in counseling typically have a wide range of interests along the scientist-practitioner continuum. These interests often change over time throughout their graduate training and career.

Training Models

The scientist-practitioner model is espoused in the majority of graduate training programs. The first national conferences for the training of clinical and counseling psychologists were held in Boulder, Colorado, and Ann Arbor, Michigan, in 1949 and 1950, respectively (see Baker & Benjamin, 2000, for a more detailed historical overview). One major purpose of the Boulder conference was to develop a broad scientist-practitioner model of training that came to be known as the Boulder model (Raimy, 1950). The creators of that model stressed the philosophy that students need to be trained to do research and to learn the skills of the practitioner. The integration of these two skill sets was believed to create a strong foundation for future research and practice. The field of counseling psychology

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reiterated its commitment to the scientist-practitioner model, most notably in 1951 at the Northwestern conference (Whiteley, 1984), in 1964 at the Greystone conference (Thompson & Super, 1964), again in 1987 at the Atlanta conference (Meara et al., 1988), and into the 1990s (Watkins, 1994). Meara and colleagues described the model in this way:

> The scientist-practitioner model is an integrated approach to knowledge that recognizes the interdependence of theory, research, and practice. The model emphasizes systematic and thoughtful analyses of human experiences and judicious application of the knowledge and attitudes gained from such analyses. In this way, an attitude of scholarly inquiry and critical thinking is deemed as essential to all of the activities in which a counseling professional engages. (p. 368)

Other models of graduate training have emerged. For example, the local clinical scientist model was presented as an alternative model to bridge science and practice and has been adopted by several programs that emphasize practitioner training (Stricker & Trierweiler, 1995). In this model, clinicians are encouraged to apply what they have learned from the research literature into their counseling work and embody a scientific attitude through "disciplined inquiry, critical thinking, imagination, rigor skepticism, and openness to change" (Stricker, 2007, p. 86) when facing evidence from their work with clients. The local clinical scientist model focuses on how clinicians develop and test hypotheses in the session while working with their clients. Local clinical scientists treat each client as a test of a model and the counseling room as a research laboratory. A group of clinicians can then collaborate to collect data from their clinical work, share the data with one another, and aggregate results across individuals.

The Association for Psychological Science also has moved to adopt an accreditation process for clinical science training programs. The clinical science model emphasizes training that is "grounded in science, practiced by scientists, and held accountable to the rigorous standards of scientific evidence" (McFall, 1990). Its advocates argue that other training models have shifted in their focus toward practice training that occurs outside of solid and intentional training in the use of science to inform effective practice and the ability for practitioners to adequately consume and integrate findings from the scientific literature.

Although the particular training emphasis differs among each of these models, and their merits have been the subject of some debate (e.g., Sanchez & Turner, 2003), all share the commitment to training counseling professionals who are committed to the reciprocal nature of science and practice. Further, they share a core foundation in scientific or critical thinking that forms the foundation for all professional activities.

The Role of Scientific and Critical Thinking

Scientific or critical thinking is a central outcome of graduate training. The most important outcome is whether the graduate can utilize scientific or critical thinking in all professional activities rather than the actual level of engagement in science or practice activities. Scientific thinking refers to a controlled method of inquiry

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and reasoning, typically to collect data of some kind for the purpose of testing a hypothesis. Indeed, graduate students are trained to solve problems and to possess the methodological skill to think critically about a problem in order to conceptualize the problem.

A crucial characteristic of a professional counselor is the integration of scientific thinking into the daily activities of professional practice (e.g., Gambrill, 2005; Pepinsky & Pepinsky, 1954). Scientific thinking is instrumental in how counselors process information about a specific client during counseling as well as evaluate the counseling process. One of the hallmarks of graduate work in counseling is to acquire critical thinking skills, the ability to identify and process information with fewer biases, stereotypes, and assumptions; formulate hypotheses; gather data; and make informed decisions.

Research clearly indicates that people are selective or biased in the type of information to which they attend and do not think as "objective computers" (e.g., Gambrill, 1990, 2005; Nisbett & Ross, 1980). In particular, people often attend to information that confirms their existing beliefs or discount information that is contrary to their existing beliefs (e.g., Kahneman & Tversky, 1973; Kahneman & Tversky, 1979). We develop worldviews that are culture bound and prone to stereotypes and assumptions about a variety of characteristics and identities, including but not limited to race/ethnicity, age, gender, social class, sexual orientation, and ability status (e.g., see APA, 2003). These biases, along with others that will be discussed throughout this book, can lead to problems for psychotherapists as they process information about clients. Tracey, Wampold, Lichtenberg, and Goodyear (2014) argued that psychotherapists are prone to a number of errors, particularly in their assessment of their level of expertise in their work with clients. In particular, they explained the need for psychotherapists to adopt a disconfirming scientific approach, avoid the overuse of hindsight bias, and utilize hypothesis testing in work with clients. It is, therefore, essential that we think critically and utilize the scientific literature to inform our practice so as to prevent harm in our professional work with clients.

Becoming an active consumer of the professional research literature is a basic expectation of graduate training (e.g., Goodyear & Benton, 1986). Reading the literature affects our thinking, refines our conceptualizations of the counseling process, and informs our treatment interventions. In this book, you will learn how to consume the research literature, assess findings from research, and utilize the knowledge in your own professional practice and scholarship.

SUMMARY AND CONCLUSIONS

The counseling profession helps people with a wide variety of personal, educational, and career-related problems. We must remain cognizant that we are working with real people, many of whom need critically important information and/or are experiencing psychological pain and are in need of professional assistance. In this chapter, we discuss different ways to acquire knowledge. To be credible, reliable, and effective, the profession must be built on a dependable knowledge base rather than on tenacity, decrees from authority figures, or subjective opinions.

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Science represents a way of knowing and a way of establishing relevant knowledge bases for the profession. We can debate about the best way to establish suitable knowledge bases for our profession. Regardless of the perspective, however, it is critical to understand that science plays an essential role in developing the knowledge upon which the counseling profession is based. Without a strong science to promote the continual development of our field, our profession will be significantly weakened. It is, therefore, incumbent upon the counseling profession to protect and promote the development of science to continually refine a wide range of knowledge relevant for the diverse forms of counseling practice.

Although science promotes the development of relevant knowledge bases, it is essential that the members of our profession are careful in applying our knowledge bases and do not automatically assume that any particular knowledge base represents a "truth" that can be applied across different personal and historical contexts. In fact, we are at greatest risk when we consciously or unconsciously assume universal truths within counseling research and practice. Researchers, therefore, must be vigilant when applying even well documented findings across social and cultural contexts.

In summary, we highlight two important conclusions. First, the role of science is essential for the well-being, growth, and survival of the counseling profession. Second, the ability of counseling professionals to appropriately apply scientific knowledge to facilitate the development of a diverse clientele is essential. It is critical that we think scientifically and question assumptions, biases, and stereotypes. In the next chapter, we outline steps to ensure these goals.

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2 Chapter Research Training: Joys and Challenges

It takes many years to become truly skilled at a complex set of tasks, such as becoming a skilled potter. For example, in Japan, it is common for an apprentice potter to make the same vase form for many months just to acquire the specific skills to consistently make 15–20 identical vases in a row. Expertise develops over time within an environment that fosters development.

In this chapter we discuss the process of becoming a skilled researcher and the type of training environments that seem to be most helpful for students to acquire the necessary skills and attitudes. For many students in counseling, graduate school is their first introduction to research and research design, and it evokes many emotional reactions that come with any novel experience, from joy and excitement to anxiety and disenchantment. We seek to prepare students to approach research with enthusiasm for the creativity involved and with a willingness to learn the intricacies of the craft and the joy of creating new knowledge for the profession. In addition, we want to promote an awareness of the anxiety that may be created by learning a technical skill that may not be central to one's interests but is required to accomplish a goal (that is, obtaining a graduate degree and becoming a professional in counseling).

We address four topics in this chapter. First, we provide a brief overview of how science intersects with counseling and psychology training through the scientist-practitioner model and the topic of evidence-based practice. Second, we identify and discuss some issues related to the developmental process of acquiring research competencies, specifically the joy as well as the challenges and fears. Third, we discuss ways in which counselors and counseling psychologists can train others to become competent, eager, and productive researchers. In this part of the chapter, we discuss what is known about research training, and how training environments can be structured to create the opportunity for students both to learn about research, and to consume and produce quality research products. Fourth, we discuss ways to broaden the concept of scientific training to include scientific thinking skills as well as research application skills. Most important, throughout this chapter we emphasize the developmental process of acquiring skills step by step to become a skilled researcher and scientist.

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SCIENCE AND PRACTICE

The Scientist-Practitioner Model

Bridging the gap between research and practice in counseling is an important issue (Murray, 2009). As we mention in Chapter 1, many graduate training programs in counseling espouse the *scientist-practitioner model* of training. Basically, this model consists of training in both scientific and practitioner activities; the basic assumption is that students trained in both science and practice will be better prepared for the multitude of employment demands in the counseling profession. The scientific activities include courses that focus on the philosophy of science, qualitative and quantitative designs and methods, statistics, evaluation, counseling research literature, and often involvement in research projects (Larson & Besett-Alesch, 2000). The practice-oriented side includes courses such as counseling methods, counseling theories, personality, assessment, and involvement in a variety of practicum experiences. When students enter a graduate training program in counseling, they typically have a wide range of interests along with the scientist-practitioner continuum. These interests often change over time, not only during graduate training but also throughout their career; thus, students need to prepare themselves broadly to allow for career changes over time.

The scientist-practitioner model goes back to over 60 years. The clinical psychologists developed what they dubbed the scientist-practitioner model of training, which is also referred to as the Boulder model (Raimy, 1950).

Meara et al. (1988) succinctly captured the scientist-practitioner model:

> Psychologists, whatever their work, are professionals and their attitude toward their work is scientific. The scientist-professional model is an integrated approach to knowledge that recognizes the interdependence of theory, research, and practice. The model emphasizes systematic and thoughtful analyses of human experiences and judicious application of the knowledge and attitudes gained from such analyses. An attitude of scholarly inquiry is critical to all the activities of those educated in the scientist-professional model. The model encompasses a variety of research methods, assessment techniques, and intervention strategies. The counseling psychologist is engaged in the pursuit and application of psychological knowledge to promote optimal development for individuals, groups, and systems (including families), and to provide remedies for the psychological difficulties that encumber them. To implement these goals, the scientist-professional psychologist adopts a scientific approach based on observation of psychological phenomena. This approach generates theoretical constructs and propositions, which are in turn tested as hypotheses (Claiborn, 1987; Pepinsky & Pepinsky, 1954). (p. 368)

The scientist-practitioner model has been the predominant model of most counseling psychology programs with 73% of the programs specifically referring to the scientist-practitioner model in their program description (Horn et al., 2007). However, over the years there have been some critiques, especially in the earlier years about the utility of the scientist-practitioner model, which students

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may also have concerns about today. These included questions such as whether most practitioners use research findings in their practice. Moreover, it could also be that graduate training in practitioner activities does not adequately incorporate scientific activities, and vice versa (e.g., Stoltenberg et al., 2000). Some people might think that perhaps the type of research being conducted is too distant from the reality of the practitioner (see, e.g., Howard, 1984), or perhaps our research methods reduce counseling phenomena to meaningless numbers (see, e.g., Goldman, 1976). Yet another factor could be that students admitted to graduate programs have predominantly social or interpersonal interests (see, e.g., Magoon & Holland, 1984).

Therefore, other training models have emerged. These models share the core goals of integrating science and practice, but with different emphasis. For example, the *practitioner-scholar model* places more emphasis on the training of practitioners and was closely associated with the emergence of professional schools of psychology and Psy.D. degrees. This model also parallels the idea of local clinical scientists (Stricker & Trierweiler, 1995) and practice-based evidence (Barkham & Mellor-Clark, 2000) that emphasize using clinical work and observations of clients to collect data and test clinical hypotheses. On the other end of the science-practice training spectrum, the *clinical science model* (Academy of Psychological Clinical Science, 2014) is similar to the scientist-practitioner model in theory, but places even more emphasis on science and uses empirical approaches to advance clinical science.

The importance of science in the psychology field has not diminished, but rather has grown over the past few decades. There has been increased emphasis on utilizing scientific findings in mental health practices. Thus, it is important for students to have the scientific skills to critically evaluate research findings rather than simply accepting knowledge from research as authoritative prescriptions (Stoltenberg et al., 2000). Integrating the scientist-practitioner model with current trends in the mental health field is important, and there are recommendations on how the scientist-practitioner model can be better implemented (see Stoltenberg et al., 2000). Chwalisz (2003) suggested that evidence-based practice is the framework for training scientist-practitioners in the 21st century. The evidence-based practice movement in psychology has become a main focus over the past decade.

Evidence-Based Practice

The increased demands from health care systems and policies to integrate science and psychology practice have made evidence-based practice an important movement in the psychology and mental health field (Baker, McFall, & Shoham, 2008). Evidence-based practice in psychology (EBPP) is "the integration of the best available research with clinical expertise in the context of patient characteristics, culture, and preferences." (APA Presidential Task Force on Evidence-Based Practice, 2006, p. 273). The field of medicine is an example of how EBPP has shaped the improvement of patient outcomes in utilizing research in clinical practice (Woolf & Atkins, 2001). EBPP is a more comprehensive concept than a closely related movement of establishing empirically supported treatments

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(ESTs), which refers to the specific treatment that works for certain disorders or problems. Whereas ESTs focus on the treatment approach, EBPP starts with the client and with the attempt to utilize research evidence to inform treatment to achieve the best possible outcome for the client. Moreover, EBPP includes a broader scope of clinical/counseling aspects, such as assessment, case formulation, counseling relationships, etc.

In APA's 2006 Presidential Task Force on Evidence-Based Practice, research evidence, clinical expertise, and patient characteristics were all emphasized as critical components leading to best practices. In terms of this research evidence, a broad array of scientific results related to intervention strategies, assessment, clinical problems, and client populations are all included. Multiple types of research evidence such as efficacy, effectiveness, cost effectiveness, cost benefit, epidemiological, and treatment utilization are all recognized as contributors to informing best psychological practices. EBPP also requires mental health practitioners to recognize that treatment method (Nathan & Gorman, 2007), counselors/therapists (Wampold, 2001), therapy relationship (Norcross, 2002), and the client (Bohart & Tallman, 1999) are all critical components to achieve best outcomes in psychological practices, and therefore research evidence on any of these aspects should not be overlooked.

Clinical expertise is also a critical component of EBPP (APA Presidential Task Force on Evidence-Based Practice, 2006). Counselors and psychologists are recognized as essential contributors in identifying the best research evidence based on the client's characteristics, background, presenting issue, and preferences. Thus, it is important that counselors and psychologists are trained not only as practitioners but also as scientists so that their practice is informed by scientific literature. Client characteristics, culture, and preferences are also important parts of EBPP. Counselors and psychologists should take into account what works for whom when providing guidelines for effective practice. EBPP requires attention to client characteristics such as gender, sexual orientation, culture, ethnicity, race, age, religion, nationality, disability status, etc. In addition to client characteristics, it is also important to consider the client's values, religious beliefs, worldviews, goals, and preferences for treatment when determining and utilizing the best available treatment for the client.

Although APA and many training programs have supported EBPP, there has also been resistance toward EBPP. Similar to the critiques of the scientist-practitioner model, there have been several reasons that EBPP raises concerns. Lilienfeld and colleagues (2013) examined the roots of resistance to EBPP by clinical psychologists and summarized six sources:

> (a) naïve realism, which can lead clinicians to conclude erroneously that client change is due to an intervention itself rather than to a host of competing explanations; (b) deep-seated misconceptions regarding human nature (e.g., mistaken beliefs regarding the causal primacy of early experiences) that can hinder the adoption of evidence-based treatments; (c) statistical misunderstandings regarding the application of group probabilities to individuals; (d) erroneous apportioning of the burden of proof on skeptics rather than proponents of untested therapies; (e) widespread mischaracterizations of what EBP entails; and (f) pragmatic, educational, and attitudinal obstacles, such as the discomfort of many practitioners with evaluating the increasingly technical psychotherapy outcome literature. (Lilienfeld, Ritschel, Lynn, Cautin, & Latzman, 2013, p. 883)

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In addition to highlighting the roots of resistance, Lilienfeld et al. (2013) also offered suggestions on how to address these resistances among students in training. They suggested exposing students to a better awareness that they are not immune from cognitive biases, such as confirmation bias, hindsight bias, and illusory correlation. They also suggested graduate instructors to not only convey accurate information, but also disabuse students of inaccurate information, especially around misunderstandings of the human nature. They also argue that students should not just be taught the "hows" of implementing therapy techniques, but more so the "whys" of how these approaches have been established as effective. In sum, Lilienfeld et al. stressed the importance of critical thinking and scientific training of students in the mental health field. For more detailed information on EBPP, as well as the resistance toward EBPP, please see APA Presidential Task Force on Evidence-Based Practice (2006) and Lilienfeld et al. (2013).

Science and Practice Training

The focus between research and practice has been an issue for training programs that emphasize both. Sometimes the model has been interpreted as a 50–50 split of performing science and practice activities. The type of model in its ideal form (i.e., implicitly 50% practitioner and 50% scientist/researcher) may be just that—an ideal that is rarely found in reality. Gelso (1979) proposed that it may be more realistic to train students in both domains (in varying degrees depending on their interests) with the expectation that students will find a suitable place for themselves in performing relevant activities on the scientist-practitioner continuum. Thus, one student might prefer a 20–80 split while another might choose a 75–25 split. Sometimes there have been implicit values attached to either science or practice; that is, some educators might value science more than practice, and thus feel more satisfaction when a new graduate obtains the "best" job, which to them is an academic position complete with a myriad of scientific pursuits. We strongly believe that science and practice are both highly valued activities in the counseling profession, and that as a profession we are stronger (and only can survive) when we train students to be competent in both science and practice. In short, it is important for the profession to equally value various points along this performance continuum.

We prefer to conceptualize the *core* of the scientist-practitioner model in terms of scientific or critical thinking. In short, we are suggesting that the role of scientific or critical thinking is a central outcome of a wide range of science and practice activities. The choice of whether a graduate engages in science or practice activities is not the most important outcome, but rather whether the graduate can utilize scientific or critical thinking in whatever professional activities she or he chooses. For example, a counseling center staff member might be engaged primarily in direct client service and, say, one program evaluation project (see Chapter 22); this might be a 5%–95% science-practice split of *professional activities*. A faculty member (three-quarters time) with a quarter-time direct service appointment in the counseling center might have a 75%–25% split of professional activities. In addition to the quantitative difference in how

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research and practice is split, the role of research can also be qualitatively different. Gelso and Fretz (2001) proposed a three-level model of how research functions for counselors. First, the minimum level involves counselors being able to consume and apply research in their work with clients. The second level involves counselors being able to use critical thinking to develop and test hypotheses during their work with clients. The third level involves being able to conduct empirical studies and to present the research findings. Regardless of the type of professional activities a person selects along the scientist-practitioner continuum, we maintain that counselors utilize scientific thinking within their practice and science activities.

Baker, McFall, and Shoham (2008) suggested that the lack of adequate scientific training and utilization of scientific knowledge has been a major problem in the development of the clinical psychology field, which is also a reflection of the mental health profession:

> Clinical psychologists' failure to achieve a more significant impact on clinical and public health may be traced to their deep ambivalence about the role of science and their lack of adequate science training, which leads them to value personal clinical experience over research evidence, use assessment practices that have dubious psychometric support, and not use the interventions for which there is the strongest evidence of efficacy. Clinical psychology resembles medicine at a point in its history when practitioners were operating in a largely prescientific manner. Prior to the scientific reform of medicine in the early 1900s, physicians typically shared the attitudes of many of today's clinical psychologists, such as valuing personal experience over scientific research. (p. 67)

In the end, there is no doubt that research has enhanced the practice of counseling. Even though a practitioner may not be able to cite a specific reference, his or her graduate school training was likely based on a tremendous amount of research data, all the way from personality theory to intervention strategies. The accumulation may be slow, but the data eventually advance our working knowledge of the field. The scientific method and research have advanced the field, but they could be even more helpful. In addition, training in both science and practice has become more sophisticated with not only more integration but also more emphasis on critical thinking, which is the core of all science and practice activities of the counseling profession. For more information on a broad array of recommendations for enhancing training in the scientist-practitioner model and how EBPP is a framework for training scientist-practitioners in the 21st century, see Chwalisz (2003).

JOYS AND CHALLENGES IN ACQUIRING RESEARCH COMPETENCIES

Students will often experience a number of different reactions to research training, and these emotional reactions can change throughout the course of their graduate training and actually many years beyond (see Table 2.1). Sometimes students will be elated with the joy of discovering new and useful information from their research. Other times students will become restless and disgruntled with the minutiae

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TABLE 2.1 Common Student Reactions toward Research and Our Suggestions

Student Feelings	Our Suggestions
I don't know enough to conduct any meaningful research.	Volunteer to help on a research project; slowly work your way up to learn the more advanced skills.
I am a fraud and really don't know how to do research.	Feelings of anxiety and doubt associated with research are normal; they are often due to having limited experiences.
What if I make a mistake and report inaccurate findings?	It is a learning process; allow yourself time to learn and develop more advanced skills.
I'm scared of running into debilitating writing blocks in my research.	Acquiring research and thinking skills occurs over a long period of time; sometimes it is a sign that you may need to acquire more knowledge of the literature.
I am afraid that my results will be statistically nonsignificant.	Programmatic research often results in the accrual of knowledge over time; nonsignificant results are also helpful information.
The whole thesis process seems overwhelming, tedious, long, anxiety producing, confusing, and complicated.	The more you get involved in research, the more self-efficacious you will feel.
I just want to practice; I am not interested in science/research.	Be open to learning more about the research process as well as the research literature.
science = statistics	Science and research are broader than quantitative studies that utilize statistics. Critical thinking is the core of science.
I don't believe that research in counseling can make a difference in the profession.	Read literature review and meta-analysis articles to get a better understanding of cumulative knowledge base.
Science is too intellectual, too cognitive, and unrelated to the experiences of real people.	As you obtain more experience with research activities, your research interests may increase and you might see a higher value on the role of research.

associated with research. In addition, some students will experience obstacles such as negative self-talk, procrastination, perfectionist tendencies, and a range of "shoulds" (e.g., I should be better at math; see Heppner & Heppner, 2004).

The developmental process of acquiring research competencies takes considerable time, years in fact, and often differs across students. Throughout this chapter are reflections from experienced and skillful researchers who provide some useful glimpses into this developmental process of acquiring an array of

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research competencies. A great deal of wisdom is communicated by these prolific and creative scholars, and we appreciate their candid perspectives on their own developmental journey.

These reflections on their journeys throughout the chapter depict various aspects of the developmental process of acquiring research competencies. From our collective experiences as authors of this text, we have observed that many students question whether they can adequately learn the skills associated with research and science: How can I, a mere graduate student, come up with a good research idea? What if I get bogged down in my research and never finish my degree? Statistics scare me—what if I make a mistake in analyzing my data? We contend that these and other fears are common and developmentally normal. We believe it is essential to discuss the negative affective and cognitive components associated with research, and thus the first section focuses on such common student reactions, namely (a) performance anxiety and efficacy; (b) the false dichotomous conceptualization as research versus practice; and (c) belief in oneself as a researcher, and science in general.

Performance Anxiety and Efficacy From our experience working with students, we have found that performance anxiety is a central and crucial affective issue. For example, common student disclosures include: "I don't know enough to conduct any meaningful research on my own. How can I do a thesis?" "Any study that I could do would be so basic and bland as to make it worthless." "I feel completely inadequate in even conceiving a study that examines counseling from a unique perspective." "Although I made it through the statistics and research design courses, once I start to do some research, I'll be 'found out'; I am a fraud, and really don't know how to do research." "What if I make a mistake and report inaccurate findings?" "I've had trouble writing before, and I'm scared to death that I will run into debilitating writing blocks again in my research." "I am afraid that my results will be statistically nonsignificant, and all of my research efforts and time will just be one big waste." "I've seen other students in the throes of a dissertation. The whole process seems overwhelming, tedious, long, anxiety producing, confusing, and complicated."

It is important to put these and similar feelings into the context of the typical entering graduate student. Most incoming graduate students have had some experience (or even a lot) with helping other people, and consequently the benefits of counseling and other practitioner activities are abundantly clear. Moreover, for most of us, helping people is a personally rewarding experience, and students have an understanding of those rewards. Conversely, it has been our experience that most incoming students have had considerably less experience with science. Typically, students do not imagine themselves making contributions to the profession by publishing in our professional journals. Since students have had little, if any, research experience, they often have legitimate reasons to question and doubt their skills and abilities—these feelings, concerns, and fears are thus developmentally normal. In fact, it is not uncommon even for faculty to experience performance anxiety and question their efficacy (e.g., see Research Journey 2.1).

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This suggests to us that acquiring the necessary research and thinking skills occurs over a long period of time; it does not happen all at once. In fact, expert performance is found associated with active engagement in deliberate practice, which involves training on particular tasks, receiving immediate feedback, having time for evaluation, problem solving, and the opportunity to refine behaviors (Ericsson, 2008).

RESEARCH JOURNEY 2.1

Developing competencies in research is not an event. Instead, it is a slow journey; as some markers are achieved, new competency goals quickly surface, even as a senior faculty member. I am committed to life-long learning! This applies to life in general and also to my life as a researcher. I did not always hear encouraging words from others about my ability to carry out a project or the importance of my work. Early in my career, I focused on the negative messages that I received. It took a while for me to tune out the naysayers and find ways to identify growth areas to strengthen my research so that it could contribute to the literature in the ways that I found important. I have had to learn how to believe in what I do and in my ideas. I was able to do this by seeking feedback from those who conducted similar research—from people who "got" my work and thus were able to identify strengths and limitations of the work in a constructive way. I now recognize that to be a good researcher requires feedback and input from a number of sources. To help develop a research project, it is absolutely essential to share your work with others and get feedback at all stages. Over the years, I have learned that it is okay to have a project be underdeveloped in its initial conceptualization—others do not judge me on where I start, but rather on where I end up. That is, how I have incorporated the ideas and suggestions from others and how much the project has developed over time. Knowing this has provided me the space to make mistakes, learn, and grow.

—Helen Neville, Ph.D.

As students acquire and begin to apply their knowledge about research design, we have been struck by *many* students' surprise and actual delight about research as they get past their initial fears. We often have heard comments like, "I'm actually *enjoying* this research course"; "I never thought I would be a researcher; now I'm beginning to reconsider my career goals"; "This research stuff is contagious; I'm starting to think about research studies a lot and I want to collect data now!" (e.g., see Research Journey 2.2). In sum, the major point is that beginning graduate students often have considerably less information about research and science than about practitioner activities. Moreover, there is evidence that as students obtain more experience with research activities (especially if it is early in their training), their research interests increase and they place a higher value on the role of research (e.g., Gelso, Baumann, Chui, & Savela, 2013).

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RESEARCH JOURNEY 2.2

When I started graduate school, my dream was to become a director of a counseling center. Research was not part of my career dreams, and I had no sense that I could ever publish in a professional journal. However, subsequent research experiences in my coursework, especially with my doctoral advisor, David N. Dixon, shifted my career aspirations toward academia. Several years later after having a modicum of success in publishing, I realized that the most important goal was the accumulation of knowledge from the systematic study of a particular topic, and subsequent theory development. Several more years later, I more fully realized the importance of the context surrounding my research topic, and in particular, the many variables (age, SES, race) within participants' cultural context that greatly affected our research findings. I also realized our research efforts alone were insufficient to create the knowledge bases needed for tomorrow, and that the worldviews and power of journal editors, editorial boards, and others in leadership positions in our profession played a critical role in the creation of our future knowledge bases. This realization led me to engage in a number of professional roles (e.g., editorial boards, assuming editorships, involvement and leadership positions in professional organizations), all aimed at improving knowledge bases and promoting social justice in counseling psychology. In the end, one of the things I greatly value in our profession is the many ways that we can join hands with diverse partners to create knowledge bases and theories to promote the development of a broad array of people.

—Puncky Heppner, Ph.D.

Thus, our advice to students regarding performance anxiety is first of all to recognize that feelings of anxiety and doubt associated with research are normal, and often reflect where one is in the developmental process of acquiring new competencies, in this case research competencies. Second, we strongly recommend that students get involved with research projects to slowly develop various research competencies. We believe the best way to create a sense of research efficacy is to learn and perform those skills. For example, students might offer to volunteer to help on a research project to learn the basic research skills, and slowly work their way up to learn the more advanced skills (e.g., see Research Journey 2.3). In essence, both our experience and our research have suggested that the more students get involved in research, the more self-efficacy they tend to feel; the more efficacious students feel about conducting research, the more positive they are about the training environment and interest in research (Gelso et al., 2013; Kahn, 2001).

RESEARCH JOURNEY 2.3

I had the good fortune of becoming Professor Donald Atkinson's doctoral advisee in counseling psychology at the University of California, Santa Barbara, back in 1996. I learned firsthand via Don's work the power of research—that is, good

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research work can lead to significant changes in our profession and society (e.g., increased attention to multiculturalism). It was also during that time that my research training became more solidified through several courses on research methods and statistics (by the way, I used the first edition of this book in my main research methods course and it couldn't have offered me a better start!). Most importantly, however, it was the day-to-day work on several research studies with Don and other students that taught me the intricacies of research, starting from problem conceptualization and moving into research design, data collection, data analyses, and manuscript publication. So in hindsight, I mostly "learned by doing." And I've come to understand that there is no magic formula to becoming a good researcher but to have good people around you who also are enthusiastic about research. At this point in my career, as a full professor with tenure and the editor of Asian American Journal of Psychology, I continue to believe that research success is a function of inquisitive and informed researchers working together for a common goal. So my recommendation continues to be: "Get involved, join a research team, study the topic of your passion, and don't forget to enjoy the process! The outcome will then take care of itself."

—Bryan S. K. Kim, Ph.D.

Threats, Unrewarding Training, and Disenchantment For any of a number of reasons, students' research training is often less than rewarding, and actually often rather threatening, all of which can result in student disenchantment. It is not uncommon for students to enter graduate school with ambivalence and anxiety about the academic and research requirements that they have to meet over the next several years. Many students are intimidated by their instructors and professors; in particular those that teach courses in which the students feel less competent in (such as statistics and research methodology, which are less directly associated with counseling practice). Moreover, the idea of coming up with an innovative research topic for their thesis is quite daunting. It is hard enough to generate adequate research questions for a study, let alone finding measures, collecting data, statistical analysis, and writing all these up into a lengthy thesis! With the anxiety experienced around research, the program and training can feel quite threatening. Unfortunately, when students have little experience with research and science, one bad experience can create tremendous attitudinal and motivational damage and move a student a long way from future scientific activities. Some training programs may actually decrease students' interest in research.

The profession has come a long way in enhancing research training over the last two decades. Consideration of students' affective reactions, values, and individual differences, and of the training environment will most likely continue to enhance the development of students' research efficacy. In addition, consideration of cultural values and social connections are especially important issues for some

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racial/ethnic minority and international students whose cultural values make it more difficult to seek and participate in the research groups without others' invitation or help.

The False Dichotomous Conceptualization of Science versus Practice Another developmental issue is how students conceptualize science and research, and their relationship to practice. A common statement is, "I just want to practice; I am not interested in science/research." Sometimes the scientific enterprise is erroneously conceptualized as totally separated from applied work in counseling. Thus, a false dichotomy is established, science versus practice. Actually there is interplay between science and practice. Our belief is that those students who develop skills in both arenas will be better equipped to do the work of the counseling profession (for example, see Research Journey 2.4).

RESEARCH JOURNEY 2.4

When I started my undergraduate studies, I was sure that I wanted to be a police detective. Although I realized that path was not in the cards for me, the drive to find solutions to mysteries has never left. I quickly realized when it comes to research that the world is far more complex than I originally thought. Additionally, with complex questions come complex answers that frequently result in multiple equally valid solutions. This process is what draws me into doing research and at the same time the multitude of possibilities and enormous amounts of information can be paralyzing—a common theme I hear from my students. Yet I have found two sources of inspiration: (a) working with others (counselors, researchers, and clients) to be sure I am expanding the way I am thinking about any given topic and to stay connected to the lived experience of those who matter the most, and (b) tackling specific questions so that each study is manageable. In this way, each study is akin to adding to an ongoing conversation, and developing a research agenda or doing multiple studies in the same area allow for the conversation to continue. I find this process very gratifying and rewarding!

—Jesse Owen, Ph.D..

Moreover, one of the hallmarks of graduate work in counseling is to acquire critical thinking skills, the ability to identify and process information with fewer biases, stereotypes, and assumptions; formulate hypotheses; gather data; and make informed decisions. These critical thinking skills are essential in both the practice and science arenas. Higher critical thinking ability has been found as a key characteristic of master therapists (identified as having exceptional mastery of therapy by their peers; Jennings & Skovholt, 2015; Ronnestad & Skovholt, 2013; Skovholt, 2012). A qualitative meta-analysis of six studies that examined characteristics of master therapists in different countries found that master therapists have developed

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more sophisticated and complex conceptualization of clients' presenting issues (Jennings & Skovholt, 2015). One of the key themes identified across master therapists in all the studies was the capacity for cognitive complexity and intricate conceptualization. This capacity was developed through ongoing learning through reflection, feedback, and teaching others.

Our advice to students is to avoid a narrow conceptualization of research and science and to not prematurely conclude that research and science have little or nothing to offer the practitioner (Skovholt, 2012). Rather, we encourage practice-oriented students to be open to learning more about the research process as well as the research literature, and how these experiences can inform practice and improve their counseling competence. The scientific method is simply a set of tools to establish a controlled mode of inquiry about all of our professional activities, research and practice.

Disbelief in Oneself as a Researcher and Science in General A critically important belief in the process of becoming a competent researcher is believing in one's ability to conduct meaningful research as well as belief in the utility of research, that research does contribute to the profession's knowledge bases, and that our research can and does make a difference in clients' lives (e.g., see Research Journey 2.5).

RESEARCH JOURNEY 2.5

Being involved in research that has the potential to make a difference is a meaningful aspect of my work and motivates me to persist when encountering inherent obstacles in the research process. After graduating from college with degrees in Biology and Sociology (and a minor in Women's Studies), I worked in an inner city battered women's shelter. At the shelter, I became interested in what differentiated women who returned to the abuser from women who struggled to create nonviolent lives for themselves and their children. In part, this desire to understand critical social problems motivated me to purse a master's degree, where I focused my thesis on shelter workers' perceptions of battered women. I loved how my work in the shelter informed and was informed by my research. I also began to see that while helping people individually was rewarding to me, I might be able to make a difference through sharing my research findings with others. My doctoral program solidified my passion for research as I was given the opportunity to study topics of interest that had real-world applications, including helping women to achieve economic self-sufficiency. I sometimes struggle with a component of research (e.g., collecting data from difficult to obtain samples), but as soon as this task becomes very painful, the next step in research brings new and exciting challenges (e.g., analyzing the data!). Also, working with students and colleagues on research teams makes the research process a wonderful, fun, and memorable adventure.

—Karen O'Brien, Ph.D.

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It is common for students to not initially feel efficacious as a researcher nor to believe that our research in counseling can make a difference in the profession. Most beginning students do not have much of an understanding of the role of science in our profession, and since they do not have a long history in the profession they are unable to identify how previous research has contributed to the profession. Similarly, students do not have a clear understanding of the utility of the scientific method as a way of thinking about either research or clients. Finally, the student typically has had relatively little experience of expanding his or her understanding about clients and applied problems by engaging in research, reading the professional literature, and contemplating the implication of empirical findings. One unfortunate outcome is that students sometimes fill this void with misinformation, like "science = statistics." Or students believe that "science is too intellectual, too cognitive, and unrelated to the experiences of real people." Or "the scientific method is so mechanical and reductionistic that it cannot be used adequately to study the complexities of real human behavior." Conversely, seasoned researchers understand both the challenges of conducting meaningful research and the gradual but steady accumulation of knowledge from our research. Even though it is rare that any one study has a major impact on the profession, programmatic research often does result in the accrual of knowledge over time, and often achieves significant conclusions. For example, many of the chapters in the *APA Handbook of Counseling Psychology* (Fouad, Carter, & Subich, 2012) are based on extensive literature reviews and nicely reflect the utility of our research in creating knowledge as well as enhancing the sophistication of our conceptualization of relevant constructs in counseling.

Clara Hill, a creative and prolific counseling researcher, was invited to write a personal account of her evolution as a researcher. Her account illustrates how she made decisions, how complex the process of research can be, and how she coped with the ups and downs along the way and, most important, her "crisis of faith in research":

> After this series of studies I underwent a crisis in terms of research. I had achieved tenure, had my first baby, and turned 30. I started questioning everything. Because I could see so many imperfections in my research, I was not very proud of my work. It had taken an incredible amount of time for little "hard information." I could not even remember the results of many of my studies. Further, I seemed woefully far from even describing what happens in the counseling process let alone understanding what counselor behaviors were useful in effecting change. I despaired that counseling was far too complex to be studied. I had previously had lots of doubts about my research, but it was mostly related to self-confidence in my research abilities. This crisis seemed to have more to do with whether I felt that research was a viable means to answer questions about the counseling process. (Hill, 1984, p. 105)

Hill's behind-the-scenes disclosures are illuminating as well as often relieving for many students and faculty. We strongly encourage students to read this article, perhaps during their first course on research methods. We have found that Hill's frustrations, jubilations, feelings of inadequacy, and doubts about the role of research resonate strongly with students. The evolution of Hill's confidence in the utility of conducting research in her own way not only sends a useful message, but also illuminates the developmental processes of students and faculty in becoming skilled and competent researchers.

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From our experience, it is critical not only that researchers feel efficacious in conducting relevant and important research, but also that they begin to perceive that their research is important, that it contributes useful information to our professional knowledge bases, and that it can make a difference in the profession as well as the lives of our clients. Such beliefs often are the result of identifying implications of your research findings to practice, being cited in the professional literature in meaningful ways, or seeing either that others are using your research findings in applied settings or that your research is helping other researchers subsequently ask other important questions.

Belief in the utility of research can also result from reading the professional literature to learn the impact of others' research. Our advice is for students to not only read and reflect on the literature, but also to read literature reviews in particular (see Major Contributions in *The Counseling Psychologist* or review papers in *Psychological Bulletin*). In addition, we advise students to get involved in conducting research on topics that are really important to them, either topics that they are very interested in or ones that reflect their personal values in some way (e.g., see Research Journey 2.6).

RESEARCH JOURNEY 2.6

I firmly believe that the best researchers usually have a connection and passion about their research. I developed my research program, in part, to help me understand and make sense of my own experiences as an African American man in a predominantly White college environment struggling to do well academically, while at the same time trying to learn more about my history and culture. This desire to better understand myself and the experiences of other people like me led to a dissertation, my first publication, several other articles, and a book. Everyone has experienced challenges in writing and conducting research at some point, and everybody has experienced rejection when trying to publish something. I have learned that it is not always the "smartest" people who can successfully carry out a research project and publish it, but often it is those individuals who are the most resilient.

—Kevin Cokley, Ph.D.

A MODEL FOR RESEARCH TRAINING

The purpose of this section is to discuss a number of factors that are important in enhancing research training. Our goal is not only to enhance students' awareness of what appears to be some of the major constructs in research training, but also to promote additional attention and research on this important developmental process. Based on the culminated research on effective research training, Kahn (2001) proposed a model that incorporated various factors, which is presented

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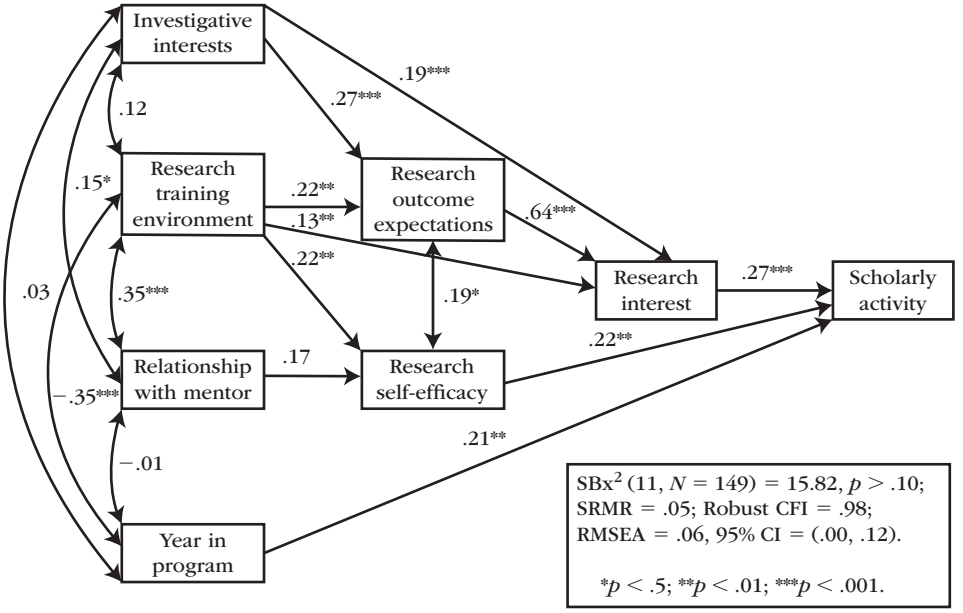
FIGURE 2.1 Parameter Estimates for the Modified Structural Model of Kahn (2001)

Source: From Kahn, J. H. (2001). Predicting the scholarly activity of counseling psychology students: A refinement and extension. *Journal of Counseling Psychology, 48,* 344-354. doi:10.1037/0022-0167.48.3.344.



in Figure 2.1. We will discuss this model and the empirical evidence that supports parts of it, as well as add a few other important aspects of research training not included in the model. We begin by discussing each of the major constructs in the model: (a) investigative interests, (b) research training environment, (c) relationship with mentor, (d) research outcome expectations, (e) research self-efficacy, (f) research interest, (g) scholarly activity, and (h) year in program.

Constructs of the Model

Investigative Interests Most students in counseling and counseling psychology can be categorized into one of Holland's (1992) three personality types: social, artistic, or investigative. Research has shown that the personality type of counseling students is related to their level of interest in research and in research courses, choice of graduate program types with varying levels of research focus, and to research productivity (Mallinckrodt et al. 1990; Tinsley, Tinsley, Boone, & Shim-Li, 1993). Specifically, it appears that students who are investigative types have more interest in research activities and ultimately produce more research (e.g., see Research Journey 2.7). Accordingly, Kahn (2001) found that a student's investigative interest would be directly related to expectations of research outcome and research interest, which in turn would be related to research

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