

Research Design in Counseling



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Research Design in Counseling, Third Edition

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I CHAPTER

SCIENCE AND COUNSELING

Counselors help people with a wide variety of personal, educational, and career-related problems. For many years, people have gone to counselors because they have problems they are unable to solve (Dixon & Glover, 1984; Fretz, 1982; Heppner, 1978a; Heppner, Cooper, Mulholland, & Wei, 2001; Horan, 1979). We as professionals assume responsibility for not only promoting the welfare of the people who seek our services, but also protecting clients from harm. Thus, as professionals we need to continually update and extend our knowledge about human nature and the field of counseling as well as evaluate our services, especially because the applied nature of our work affects the daily existence of thousands of people.

Consider the real-life example of a husband and wife who sought career planning assistance. After a thorough intake, they 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.

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 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 disks. 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. (Johnston, Buescher, & Heppner, 1988, p. 40)

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 Many other examples could be listed in which clients receive less than desirable treatments because of outdated information, ineffective or inappropriate counselor interventions, or erroneous knowledge about human behavior and the change process.

Medical professionals also aid people, although they obviously focus primarily on medical problems. The medical profession has advanced over the centuries and has become increasingly more sophisticated. Important lessons can be learned from the trials and tribulations of the medical profession. Consider the historical lesson from the so-called thalidomide babies. In the early 1960s a drug called thalidomide was prescribed in England, Canada, the United States, and several other countries for pregnant women experiencing morning sickness. The drug was administered before adequate empirical tests had been completed. Some medical scientists in England argued that the effects of the drug should have been tested scientifically, especially in comparison with groups of women who did not receive the drug. Others, however, argued more convincingly that it was unethical to withhold (from the comparison group) a drug that was "known" to greatly ease women's problems with pregnancy. For some time after the drug was introduced, a number of medical professionals observed an increase in the number of deformed babies whose arms and legs resembled buds that precede limb development in the human embryo. Years later, after appropriate empirical tests had been completed, researchers discovered that thalidomide administered to women during the critical embryonic period caused these major deformities in the babies. Although the drug was quickly taken off the market, for thousands of infants the damage had already been done. How do we know whether we are promoting the welfare of or actually harming those who seek our services in the counseling profession? None of us in the profession would intentionally want to harm clients. Counseling, however, can have detrimental effects on people (e.g., Lambert, Bergin, & Collins, 1977).

How do we know our interventions are effective? This question has led to identifying what were referred to initially as empirically validated treatments (Wampold, Mondin, Moody, Stich, Benson, & Ahn, 1997) and more recently as evidence-based practice (Chwalisz, 2003). In addition, this has led to the "great psychotherapy debate," regarding which therapy models and methods are most effective. (For more details, see Wampold, 2001, who not only traces this debate over time, but also concludes that successful outcomes are more dependent upon general therapeutic effects than any one theory or method.) What is sufficient proof that we as a profession can afford to accept? If someone proclaims that a certain intervention is effective, should we believe it? If your supervisor maintains that a certain technique is effective, is that sufficient evidence? What kind of *knowledge* must a profession be based on to succeed?

The answers to these questions rest on the manner in which the profession has developed its knowledge base.

Consider this true story of a group of faculty who were ardent believers in Freud's conception of psychoanalysis. These faculty members were relatively isolated from other professionals and had a habit of hiring only their own graduates. (They noted that because they rarely had a faculty opening and the job market was so restricted, they would feel like traitors if they hired someone else's student instead of one of their own.) These people believed that clients' paranoid fantasies were major obstacles to uncovering unconscious psychological conflicts.

Consequently, they would not allow any live recording (audio or visual) or direct observation of their therapy sessions. Nor would they allow any kind of written self-report data to be collected from clients. Their primary method of knowing seemed to be the method of authority (Freud), and it included little opportunity to objectively confirm or disconfirm Freud's ideas. Moreover, they so firmly believed in their truths that they scoffed at the utility of other therapeutic techniques such as systematic desensitization, the Gestalt empty chair, and reflection. Consequently, this group of psychologists, in the absence of any objective data, discovered very little beyond Freud's early formulations of the therapeutic process. The bottom line is that this group did not advance the knowledge of their field; by today's standards (as well as their students' evaluations), their therapy practices were archaic, and their training philosophies and methods totally inadequate.

The purpose of this chapter is to examine how the counseling profession has developed its knowledge base. This chapter focuses on the role of science in the counseling profession, including ways of knowing, philosophical foundations of science, and our views of four key issues for a philosophy of science in counseling.

THE ROLE OF SCIENCE IN COUNSELING

Science plays an essential role in developing the knowledge upon which the counseling profession is based. In this section we take a close look at science as it relates to counseling. We first discuss different ways of knowing, and particularly the scientific way of knowing. Then we discuss philosophical foundations of human behavior and introduce you to some of the issues under debate in the philosophy of science. Finally, we discuss some issues pertaining to a philosophy of science for the counseling profession. These philosophical issues are complex and intricate; our purpose is to introduce you to the basic issues, and thus we provide only a brief overview. Nonetheless, these issues form the foundation for future research and training in the profession.

SCIENCE AS A WAY OF KNOWING

Charles Peirce, a nineteenth-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—that whatever belief one firmly adheres to is truth. These "truths" are known to be true because we

have always known them to be true; Kerlinger and Lee (2000) noted that frequent repetition of these “truths” seems to enhance their validity. A second method of knowing is the method of authority. If noted authorities such as the president of the United States, a state governor, a well-known psychologist, or a clinical supervisor say it is so, then it is the truth. A third method of knowing is the a priori method, or method of intuition (e.g., Cohen & Nagel, 1934). This method is based on the notion that what agrees with reason, what makes sense, is true. The fourth method of knowing is the scientific method, which involves empirical tests to establish verifiable facts. We would add a fifth way of knowing—what is learned through one’s own direct experiences in the world. Through countless experiences, each individual construes a “reality” of the world; some of his or her perceptions may match those of others with similar experiences, whereas other perceptions and conclusions about the world may not match those of others. Dangers exist if this method is used alone because biases can develop or information can be distorted. Moreover, the events we experience can represent a biased sample, which in turn can lead to inaccurate conclusions.

Given the overwhelming complexity of life and the vast amounts of knowledge needed even in daily living, people most likely acquire “truths” through all five of these ways of knowing. Obviously, error can be involved in any of them. Such error, if it affects the knowledge on which counseling is based, can be dangerous for the counseling profession and our clients. To be credible, reliable, and effective, a profession must be built on dependable facts or truths, rather than on tenacity, decrees from authority figures, or subjective opinions.

A profession that aims to facilitate growth and positive change in clients must be based as much as possible on knowledge that exists in a reality outside of professionals’ personal beliefs and biases. The scientific method has been developed to create such knowledge.

Basically, the scientific method is a set of assumptions and rules about collecting and evaluating data. The explicitly stated assumptions and rules enable a standard, systematic method of investigation that is designed to reduce bias as much as possible. Central to the scientific method is the collection of data that allows investigators to put their ideas to an empirical test, outside of or apart from their personal biases. In essence, the proof of the science is in the data. “Stripped of all its glamour, scientific inquiry is nothing more than a way of limiting false conclusions about natural events” (Ruch & Zimbardo, 1970, p. 31).

There are obvious costs to acquiring knowledge by using the scientific method. Conducting empirical investigations is 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. Sometimes the lack of sophistication of our research methods results in conclusions that tell us little about real-life processes.

But the risks of building a profession on nonscientific evidence are far greater. The thalidomide babies are one clear example of the risks associated with not empirically testing one’s opinions. Conducting therapy based only on personal hunches and opinions is risky and might well result in harming clients

(e.g., Lambert, Bergin, & Collins, 1977). It is important that the knowledge on which the profession is built 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 contrast, subjective ways of knowing that do not involve empirical tests run the risk of creating myths. These myths can result in ineffective or even harmful counseling, and hinder the progress of a profession.

This does not mean that the professionals’ beliefs, hunches, and even biases are not useful in exploring ideas and perhaps extending the field’s knowledge. We can undoubtedly learn a great deal about human behavior from the more subjective ways of knowing; it is clear that many ideas and breakthroughs regarding therapeutic orientations and techniques have initially sprung from practitioners’ direct experience with people. However, it is important to note that these ideas must be empirically tested. In fact, no major orientation has been maintained in the profession without substantial empirical support. Parenthetically, even though the scientific method tends to provide data that are prone to less bias or distortion, Howard (1982) cogently recommended that we “periodically obtain evidence demonstrating the adequacy” of the various assumptions or procedures involved in the scientific method (p. 324).

In short, 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. Without a strong scientific foundation, the credibility of a profession is significantly challenged.

PHILOSOPHICAL FOUNDATIONS OF HUMAN BEHAVIOR

In the mid-1800s there was much confusion and speculation about the nature of human behavior. John Stuart Mill suggested that “the backward state of the moral (human) sciences can be remedied by applying to them the methods of physical science, duly extended and generalized” (Mill, 1843/1953). Mill’s suggestion not only was adopted by the newly emerging social and behavioral sciences, but also has dominated research in these areas for many years (see Polkinghorne, 1983, 1984). The basic philosophy of science that has been generalized from the physical sciences has been referred to as the received view (Putman, 1962) or the standard view of science (Manicas & Secord, 1983), and has drawn heavily on the logical positivism of the 1930s (Hanfling, 1981). The received view, however, has come under attack from philosophers of science (e.g., Bhaskar, 1975; Harre, 1970, 1972; Kuhn, 1970; Lakatos, 1970; Suppe, 1977; Toulmin, 1972). As a result, an alternative paradigm referred to as the realist’s view of science has emerged (see Manicas & Secord, 1983, for a brief overview). Basically, this view proposes that: (1) knowledge is a social and historical product and cannot be obtained only by studying the individual in isolation; (2) the experiences of an individual, whether observable or not, are appropriate topics of study; and (3) the focus of research should not

be on events and finding relationships among events, but rather on examining the underlying “causal properties of structures that exist and operate in the world” (Manicas & Secord, 1983, p. 402). The received view also has been criticized by counseling psychologists (e.g., Howard, 1984; Patton, 1984; Polkinghorne, 1984). Critics have maintained that observations are not absolute, but instead are filtered through the subjective, phenomenological world of the observer (e.g., Patton, 1984; Polkinghorne, 1984).

Our philosophical foundations not only guide our understanding of the world, but also affect how scientists conduct research to increase our knowledge relevant for the counseling profession. We will briefly discuss four philosophical underpinnings of research: positivism, postpositivism, constructivism, and critical theory. The basic assumptions of any given paradigms involve the following dimensions: ontology (the nature of reality), epistemology (the relationship between the inquirer and the known), and methodologies (the methods of gaining knowledge of the world). Table 1.1 (adopted from Lincoln and Guba, 2000, p. 168) contrasts the philosophical foundations of positivism and postpositivism (on which quantitative research is based) with the philosophical foundations of constructivism-interpretivism and critical theory (which constitute the philosophical underpinnings of qualitative research). In general, all qualitative paradigms assume relativist ontology (there are multiple realities that are socially and individually constructed) and transactional epistemology (the knower and the known are inextricably intertwined), as well as dialogic/interpretive methodology (Guba & Lincoln, 1994).

It is important for a researcher to familiarize him- or herself with various paradigmatic strands and yet understand that the boundaries between the paradigms are also in constant flux. Lincoln and Guba (2000) used a participatory paradigm proposed by Heron and Reason (1997) as an example to illustrate how this form of inquiry is informed by postpositive, postmodern, and critical theory. They argued that it is inevitable that various paradigms have begun to “interbreed” so that “two theorists previously thought to be in irreconcilable conflict may now appear, under a different theoretical rubric, to be informing one another’s arguments” (p. 164). Because research methods are interwoven with the philosophical paradigms, it is not surprising to witness the recent rise of mixed methods research design. This type of approach is beyond the scope of the current chapter. For additional information we encourage interested readers to consult references such as Bamberger, 2000; Beck, 2005; Creswell, 2003; Goodyear, Tracey, Claiborn, Lichtenberg, and Wampold, 2005; Green and Garacelli, 1997; Hanson, Creswell, Clark, Petska, and Creswell, 2005; Newman and Benz, 1998; Tashakkori and Teddlie, 2003. With this caveat, a brief discussion of four paradigms (positivism, postpositivism, constructivism, and critical theory) is presented in the following sections, with an emphasis on their differences and contradictions.

POSITIVISM Positivism is the paradigm that is best represented by 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

TABLE 1.1
QUANTITATIVE
VERSUS
QUALITATIVE
RESEARCH

Aspect	Quantitative	Qualitative
Reality	Truth exists; behavior is governed by rules and laws and is discoverable	Reality is a social construction; there are no truths to be discovered.
Representation of the world	Mathematical or verbal description of quantitative results	Linguistic; symbolic
Domain knowledge and theory	Used to construct hypotheses; theory-driven; deductive	Data-driven; previous knowledge can bias results; inductive
Intellectual bases	Mathematics, statistics, logic, physical sciences	Linguistics, philosophy, anthropology, literature
Level of inquiry	Reductionistic, atomistic	Holistic
Role of investigator	Objective, dualistic	Subjective, interactive
Role of subjects/ participants	Subjects: naive to experimental hypotheses and are acted upon; deception is an ethical issue	Participants: involved in research, are fully informed, and can be involved in analysis and results
Generalizability	A sample is used to generalize to population; deductive	Applicability is more important than generalizability; inductive
Bias	Problematic; must be reduced	Accepted and acknowledged
Validity	Involves minimizing alternative explanations	Involves effect on audience and social utility; uses triangulation
Reliability	Involves measurements without error; seeks quantitative results that reflect true scores	Not relevant

discover the natural laws that govern each and every object in the universe, and their relationship to each other. Physical laws that describe gravitation, magnetism, and electricity are examples of positivistic statements about the universe that are universal in terms of both time and context. A key principle is that “truth” exists, and given enough time, brilliant scientists, and sophisticated methods, discoveries will be made that illuminate the truth. In the positivistic realm, the scientist is “objective”; that is, the scientist neither affects the world that is studied nor is affected by it. Scientists are interchangeable in that a given experiment should lead to the same outcome and conclusion, regardless of who conducts it. Surely, some scientists are more insightful and creative than others, but in the end, experiments yield results that are self-evident to the scientific community.

TABLE 1.1
QUANTITATIVE
VERSUS
QUALITATIVE
RESEARCH
(Continued)

Aspect	Quantitative	Qualitative
Product	Research report in scientific journal; contains mathematical or statistical results, a verbal description of quantitative results, and domain-specific language (jargon)	Results written in everyday language or presented in other media; accessible to audience regardless of domain-specific knowledge; may or may not be published in scientific outlets; available, understandable, and relevant to participants
Audience	Academic community; policy implications for others are made by academics	Academic and nonacademic audiences; policy implications are integral to the product
Control	Involves controlling extraneous influences, manipulating variables, and detecting causal relationships	Involves understanding complex relationships among various factors
Goals of study	To discover truth; to explain and predict; to confirm conjectures; to extend knowledge	To describe, interpret, critique, revise, and change
Researcher's voice	That of detached, objective scientist	That of involved investigator, participant, and transformative expert
Power structure	The dominant view in the academic community in terms of publication, funding, promotion, and tenure	Is acquiring recognition; recognition from outside the scientific community is important

Confidence in results derives from the scientific method, not from the scientist; the operations of the experiment produce the results while the scientist observes objectively from the sidelines.

The scientific method involves well-defined steps. First, the scientist makes a conjecture about the nature of the universe. After that, the scientist designs an experiment such that its results will either confirm or disconfirm the conjecture. Knowledge, as opposed to mere opinion, is contained only in statements based on or linked to direct observation. The only kinds of statements free from personal bias (and thus distortion) are those grounded in observation. If the data conform to the prediction, the conjecture is verified. On the other hand, if the data do not conform to the prediction, the scientist concludes that the phenomenon being studied does not follow the conjecture, which is then

abandoned as an explanation of truth. The hypothetico-deductive (that is, deductions made from testing hypotheses) nature of this process is characteristic of positivism. Several classic experiments provide vivid examples of positivism: Galileo dropping balls from the Tower of Pisa, the bending of light to prove Einstein's theory of relativity, Madame Curie's observations of radioactivity, and changing pressure and volume related to the gas laws.

There are other important characteristics of positivistic research. First, relations typically are expressed in terms of causality—X causes Y. Second, theories are reductionistic in that complex processes are understood by breaking them down into simpler subprocesses, which can be studied more easily. Third, laws are usually expressed mathematically, measurements are quantitative, and conclusions dichotomous (either the data conform to the prediction, or they do not), resulting in the conclusion that the law is true or not. Thus, the accumulation of facts or knowledge will result in general laws of human behavior. Human nature is lawful; the goal of science is to identify the causal relationships among variables.

The overall goal of science is 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. The idea of a rigorous link among observations, hypotheses, and theory was appealing; after all, "the hard-nosed scientist," like the proverbial Missourian, wants to be "shown" the evidence (Manicas & Secord, 1983). In addition, the notion of discovering laws of human behavior based on the accumulation of objective data promised credibility as well as utility for a young profession.

Clearly, the description of positivistic research calls to mind the type of science conducted in the physical sciences, such as chemistry or physics, or perhaps that in the biological sciences, but certainly not research in the social sciences (except maybe psychophysics or perception). The positivistic tradition has evolved into the postpositivism paradigm, which recognizes the impossibility of making dichotomous conclusions when systems are complex and the behavior of organisms has multiple determinants.

POSTPOSITIVISM Postpositivism shares with positivism the belief in a "real" reality and in the goal of discovering "truth." However, postpositivists recognize that truth cannot be fully known, and that, consequently, at best we make probabilistic statements rather than absolute statements about truth. The statistical models that underlie research in the social sciences are saturated with this probabilistic interpretation. The values of p associated with statistical tests are probabilities of obtaining the data, given the assumption that the null hypothesis is true. Statistical tests assert that there is truth, but that we can never conclude with certainty that our results can differentiate among competing hypotheses. When we reject the null hypothesis (that is, 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.

Although the probabilistic nature of statistics exemplifies the postpositivistic nature of most research in the social sciences, it is only one aspect of

the research process that diverges from a strict positivistic methodology. Because of the ambiguities related to recognizing that the “truth” cannot be known for certain, 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.

Often the word *corroborated* is used to indicate that a study produced results consistent with prediction and that the conjecture has thus survived another test. On the other hand, if the data are inconsistent with theoretically derived conjectures, and the study is valid, then the theory has failed to be corroborated. In the postpositivist realm, it would be difficult to give up belief in a theory based on one experiment. However, 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 causes disease, multiple experiments of various types (for example, passive designs, experimental designs using lab animals) were needed to come to the conclusion that smoking in fact leads to various detrimental health outcomes.

An examination of research methods demonstrates the degree to which postpositivism permeates what we do. Classical test theory rests on the proposition of “true scores,” which is the true amount of a characteristic that a person possesses; however, any measurement is actually an obtained score that contains error (that is, $\text{obtained score} = \text{true score} + \text{error}$). The mere mention of reliability and validity implies that constructs exist, but that random error renders our assessments of these constructs imperfect. In statistics, population parameters are “truths” about which we collect data for the purpose of estimation or hypothesis testing.

Postpositivism also recognizes that there is bias in the scientific process, and that the conclusions researchers make are influenced by the person of the researcher. Truths are not self-evident but 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. Clearly, there are canons that must be followed (that is, the study must be valid, as described in Chapter 5) if a study is to be conclusive, but it is scientists, rather than some algorithm, who determine whether the conclusions add to knowledge.

Whereas positivism and postpositivism share the view that certain truths exist and that research can shed light on these truths, constructivism and critical theory, two worldviews on the opposite ends of the worldview continuum, have a very different conceptualization of reality. We discuss these two views next.

CONSTRUCTIVISM In the constructivism paradigm, notions of “truth” and “reality” are abandoned in favor of the notion that ideas about the world, especially the

social world, are constructed in the minds of individuals. These constructions, based on the experiences of individuals as they interact with the physical and social environment, are shaped by culture and may be idiosyncratic. Constructions exist and can be described, but they are not representations of truth. Constructions can be simple or complex, naive or sophisticated, uninformed or informed, but they cannot be proven true or false. An individual's constructions may change over time—as a result of education, increased experience with the environment, or maturation.

Constructivists believe that reality is created by the participants of any system. It is true that some event occurs, but it is the meaning attributed to that event that is important socially. Suppose that one is a childhood abuse survivor. Constructivists recognize the reality of the event (childhood abuse), but then argue that it is the meaning that is attributed to that event that is important in determining social relations and behavior. One survivor might believe that the abuse occurred because her parents failed their responsibilities as primary caregivers, thus estranging herself from her parents and later in life having difficulties in trusting other people. Another survivor might feel that her parents hurt her because they were struggling with their own survival and transferring their anger toward her. Growing up in such a familial environment, she learned to be a caretaker for her parents and others at a young age. This example demonstrates that multiple constructions of an event are possible. The important point is that constructivists believe it is the meaning that is attributed to an event, rather than the event itself, that is the important aspect for understanding behavior and social relations.

Because constructions do not represent universal truths, the investigator and the object under investigation cannot be conceived of separately. Social constructions are developed through interactions with the environment and involve mental representations and interpretations of those interactions. The investigator and the person investigated are linked, and through the investigation process the constructions of the participants become accessible to the investigator. Because the construction of a participant is internal, it is only through the interaction between the investigator and the participant, or the interaction between the investigator and the world of the participant, that the constructions of an individual can be understood.

Moreover, the constructions of the investigator cannot be separated from her or his understanding of the participant's constructions. The general methods of understanding in a constructivist world involve both hermeneutics and dialectics. *Hermeneutics* refers to the activity of interpretation, whether the data to be interpreted are language, behavior, text, artifacts, or other aspects of human behavior or thought. The constructivist must use these data to develop an interpretation that, in a sense, is a description of the constructions of the participants. *Dialectics* refers to the interaction between the participant and the investigator. At the most benign level, the interaction is a conversation in which words are exchanged and interpretations of the language lead to an understanding of constructions. At the next level, the exchange involves discussing these constructions, as when an investigator shares her or his interpretations

with the participant. At the most extreme level, dialectics involve changing constructions in the process of interpretation. This last level of dialectics (and some would say the essence of dialectics) is more characteristic of critical theory (see the next section) than of constructivism.

In the constructivist paradigm, there are no truths to be discovered; therefore, there can be no conjectures (that is, predictions based on hypothesized truths) or tests of conjectures. Thus, 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, causing the investigator to reinterpret already collected data or to collect additional data, often in ways unimaginable when the investigation began. Positivistic and postpositivistic methods are linear, whereas constructivist (and critical theory) methods are recursive (that is, 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, particularly forces created by powerful individuals. Over time, the constructions take on the appearance of reality; that is, the social reality, which has in fact grown out of the social context, is assumed to be truth. Because the constructions are so deeply embedded in society (including in the researchers themselves), it is 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 (that is, heterosexual marriage) is natural is a socially derived position.

Critical theorists would concede that it could be argued 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; that there are alternatives (same-sex unions, polygamous marriages); and that the "truth" of any "natural" propensity to marry is specious.

Ponterotto (2005b) reminded us that "there is no single critical theory" but "there are commonalities among the variants of critical theory" (p. 130). In critical theory, the investigator and the participant form a relationship, and the values of the investigator are vital to the activity. Inquiry, in critical theory, involves the level of dialectism that changes constructions. That is, the investigation involves a dialogue between investigator and other in such a way that the other comes to realize that her or his 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, the goal of critical theory is to have the participants view structures for what they are—socially constructed beliefs—rather than as unchangeable truths. Moreover, the dialectic should lead to the participants' understanding that social action is needed to change the social order, thereby being emancipated from oppression (e.g., oppression resulting from racism, classism, able-bodism, heterosexism, or sexism).

For example, feminist theory falls into 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 males, and that these social realities can be altered. Feminism seeks to “raise the consciousness” of women so that they do not consider their place in society to be fixed as truth, but instead understand both the historical context that led to the current social situation and that the first step in change is to reject the traditional roles. Many 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 (e.g., Marxism).

SUMMARY OF THE PHILOSOPHICAL FOUNDATIONS We have contrasted four paradigms that bear on the research process, albeit overly simplistically. Philosophers, since the beginning of humankind, have wrestled with ideas about knowledge and knowing. It is impossible (or irrelevant) to “prove” that one of these paradigms is correct, more appropriate, better, or more useful than another. They are different systems for understanding the world, but no method, either logical or empirical, can establish the superiority of any given view. Nevertheless, it is vital to understand the philosophical foundations of various paradigms so that our methods match our belief systems, and so that the research approach is appropriate for answering research questions within the context of existing knowledge. Morrow, Rakhasha, and Castañeda (2001) made several recommendations on how to select paradigms in accordance with an individual’s personal and mental models, research question, and discipline. A researcher should reflect on the compatibility of a particular paradigm with her or his own personal values, beliefs, personality, previous research experience, and research interests.

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. The interested reader might explore these issues further by examining some of the following: Bhaskar (1975), Caple (1985), Dar (1987), Harre (1974, 1980), Lakatos (1970), Lincoln and Guba (2000), Manicas and Secord (1983), Meehl (1978, 1987), Morrow, Rakhasha, and Castañeda (2001), Morrow and Smith (2000), Polkinghorne (1983), Schutz (1964), Serlin (1987), Serlin and Lapsley (1985), Toulmin (1972), as well as two special issues in the *Journal of Counseling Psychology* (Polkinghorne, 1984; Haverkamp, Morrow, & Ponterotto, 2005).

FOUR ISSUES FOR A PHILOSOPHY OF SCIENCE FOR THE COUNSELING PROFESSION

With regard to a philosophy of science for the counseling profession, we will discuss our views on four issues: (1) the goals of science in counseling, (2) the importance of methodological diversity, (3) the need to examine and expand our assumptions regarding human nature, and (4) our responsibility for applying research tools. The upshot of these issues is that counseling psychology has

become more sophisticated in its philosophy of science, and subsequently more sophisticated in the methodologies that are found in today's journals.

GOALS OF SCIENCE IN COUNSELING Science is a mode of controlled inquiry for reducing bias and developing credible "ways of knowing." Historically, the basic functions of the scientific approach were typically considered as twofold (e.g., Kerlinger, 1986; Kerlinger & Lee, 2000). The first function was to advance knowledge, to make discoveries, and to learn facts in order to improve some aspect of the world. The second function was to establish relations among events and develop theories, thereby helping professionals to make predictions of future events. We will now discuss philosophical issues related to each of these functions, specifically within the field of counseling.

In our view, the goal of the scientific method in counseling is multifaceted, and indeed is to advance knowledge, make discoveries, increase our understanding of human behavior, and acquire facts about counseling. However, in the realm of counseling, phenomena of interest include both observable events and subjective, self-reported experiences. Researchers for some time have examined a wide range of phenomenological or self-report variables in counseling (e.g., client satisfaction with counseling, perceived counselor expertise, client's problem-solving self-efficacy, supervisee self-efficacy, and client reactions to counselor statements). The expansion of our knowledge is often guided, in part, by pressing societal needs as well as questions or problems that professionals have in the field. For example, one pressing question has been whether client expectations about the counselor or the counseling process affect later outcomes in counseling, such as problem resolution or premature termination (e.g., Hardin, Subich, & Holvey, 1988; Tinsley, Bowman, & Ray, 1988). Or the pressing question may result from a practitioner's dissatisfaction with her or his inability to help certain clients make effective decisions about their career plans. (See Rubinton, 1980, for a study that explored the utility of different career interventions for clients with different decision-making styles.) Our research is also guided by current societal needs that merit immediate attention, such as social advocacy and social justice for previously marginalized groups. (For more details, see Speight & Vera, 2003; Toporek, Gerstein, Fouad, Roysircar, & Israel, 2005.) Another social need pertains to a number of students' needs in school environments; it has been suggested that counseling psychologists are well positioned to collaborate with school counselors to address a host of issues facing school age students (Hoffman & Carter, 2004; Romano & Kachgal, 2004). Another pressing societal need is the rapid globalization and increasingly interdependent nature of the world economically, socially, and culturally (see Heppner, 2006). In essence, "the world is internationalizing at a much faster pace than the field of psychology" (Leong & Ponterotto, 2003, p. 383), and thus there are growing demands for cross-cultural competencies in the next generation of a wide range of professionals, including counselors (Heppner, 2006). Thus, scientific research is designed, in part, to provide answers to pressing questions or societal problems. In this way, research in counseling can be very practical; in fact, one view is that the adequacy of our

research can be evaluated by how relevant the findings are for practitioners (Krumboltz & Mitchell, 1979). Scientific research in counseling can thus advance our knowledge base or understanding of human behavior by providing data that describe and help us understand a wide range of human behaviors, and how such behaviors can be altered through counseling interventions.

It is also important to develop knowledge bases and research perspectives that emphasize the social and historical context of the individual. A common defining element of the counseling profession is that we typically conceptualize a person's behavior as a function of the environment that they experience (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. Thus, the goal of science is to expand our knowledge not only about individuals, but also about the interactions between individuals and a larger personal, social, cultural, and historical context. In fact, it has been maintained that to ignore the larger social, cultural, and historical context ignores critical elements in understanding current behavior, and in this sense can lead to ineffective and even inappropriate interventions and unethical behavior (American Psychological Association [APA], 2003; Toporek & Williams, 2005).

Research, however, is guided by more than practical problems and societal needs. To achieve scientific understanding, the researcher often needs to organize observations and facts into a logical framework that explains some aspect of behavior. Thus, research is often guided by theoretical issues within a line of work and seeks to establish general relations and conditional statements among events that help professionals to understand phenomena. The accumulation of facts or knowledge will not likely result in general laws or broad scale theories of human behavior as it was earlier conceived. Human behavior is multi-determined; that is, a single action can be determined by any one of several preceding events. Moreover, human actions consist of complex chains in which preceding events increase or decrease the probability that some subsequent action will occur, but behavior is not a uniform process across individuals or even within individuals over time. Meehl (1978) likewise concluded that for a variety of reasons (such as individual differences, polygenic heredity, random events, nuisance variables, and cultural factors), human psychology is difficult to scientize and that "it may be that the nature of the subject matter in most of personology and social psychology is inherently incapable of permitting theories with sufficient conceptual power" (p. 829). Thus, the range of human variability and complexity does not much lend itself to description by general principles or broad theories, and even less to prediction.

In short, we are suggesting that it is exceedingly difficult to develop broad scale theories aimed at predicting human behavior in general. However, skilled therapists are able to make better predictions about individual people when they combine research knowledge about specific relations among variables with a host of qualifying information, namely the biographical, social, and cultural history of the individual. In this way, therapists use "the discoveries of science, but in

order to bring about changes in the everyday world, also employ a great deal of knowledge that extends beyond science” (Manicas & Secord, 1983, p. 412). Thus, it is useful for counseling professionals to continue 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 may allow both the needed specificity and complexity in explaining and predicting individuals’ behavior. In sum, we believe that the second function of science is to promote understanding, as well as help explain and predict human action, but in a much more complex and idiographic manner than acknowledged in the traditional received view.

THE IMPORTANCE OF METHODOLOGICAL DIVERSITY Inherent in the traditional view of science was the assumption that the “best” knowledge (and thus best research methodology) could be obtained from tightly controlled, experimental research that used randomization and control groups. There was an implicit hierarchy, with experimental studies at the top and correlational and descriptive studies at the bottom, seemingly based on an assumption that experimental investigations resulted in superior information. We disagree with such assumptions and maintain instead that the selection of the research method must fit both the phenomenon under investigation and the type of information sought (e.g., Ford, 1984; Howard, 1982, 1984; Patton, 1984; Polkinghorne, 1984). For example, we believe that far too often we attempt to do experimental, between-groups studies before we have an adequate description of some phenomenon; thus, in some cases, descriptive studies might very well yield more useful and important information than a controlled experimental investigation. A central thesis of this book is that it is essential to match the research design to the existing knowledge on a particular topic and the next best research questions of interest.

Since the 1980s, there has been a growing consensus for methodological diversity within counseling (e.g., Borgen, 1984a, 1984b, 1992; Gelso, 1979, 1982; Goldman, 1982; Harmon, 1982; Hoshmand, 1989; Howard, 1982, 1983, 1984; Polkinghorne, 1984, and Ponterotto, 2005b). We strongly agree that greater creativity and flexibility in using existing research methods is needed to examine important questions within counseling. Howard (1982) provided a parable that underscores the notion that different methods present advantages and limitations:

In practice, one never demonstrates that one methodological approach is always superior to another. An elaboration and extension of a parable by the astronomer Eddington might draw this point into sharp relief. Eddington tells of a scientist who wished to catalogue the fish in the sea (the research question). He took a net of two-inch mesh (a research method) and cast it into the sea repeatedly. After carefully cataloguing his findings he concluded that there were no fish in the sea smaller than two inches. In this apocryphal example, the scientist’s trust in the adequacy of his method was somewhat misplaced and led the researcher to draw an inaccurate conclusion. However, if someone had doubted the adequacy of the netting procedure and performed an investigation specifically to test its adequacy relative to

some specific alternative procedure, the misinterpretation might have been recognized. For example, our researcher might have considered an alternative research method: namely damming a small inlet of the sea, draining the water, and examining the bodies of the fish left behind. In finding fish smaller than two inches, the limitations of the netting procedure would become apparent. One would not be surprised, however, to find that the largest fish obtained via the damming approach was substantially smaller than was obtained with the netting approach: another potential problem. Therefore, research testing the adequacy of research methods does not prove which technique is better but provides evidence for the potential strengths and limitations of each. From this information, researchers can determine when one of two approaches, or both, should be the method of choice. (p. 319)

Methodological diversity spanning a range of quantitative and qualitative designs is essential for important advances in the counseling profession.

THE NEED TO EXAMINE AND EXPAND OUR VIEW OF HUMAN NATURE The assumptions one makes regarding the basic qualities of human nature (that is, cognitive, affective, behavioral, and physiological processes) affect how one conceptualizes human behavior. Moreover, our view of human nature affects the research problems we examine in counseling. Our views of human nature have changed dramatically in the past century and are still evolving. Consistent with the beliefs of some of the previously mentioned writers (e.g., Borgen, 1984a; Howard, 1984; Patton, 1984; Polkinghorne, 1984), we believe there is a need to expand our view of how human beings operate, particularly within counseling. One increasingly accepted major change of view concerning human nature pertains to human rationality. For example, Gelatt (1989) noted that his view of human decision making, especially within a counseling context, changed dramatically in the previous 25 years. In 1962 he stressed rational processes in decision making, whereas in 1989 he stressed intuitive processes and positive uncertainty (that is, accepting uncertainty and inconsistencies). Gelatt's 1989 perspective was consistent with those of a host of other writers who at that time emphasized non-rational and unsystematic processes (chance events or luck) within human decision making (e.g., Heppner, 1989; Meehl, 1978; Strohmer & Blustein, 1990; Tversky & Kahneman, 1981). Meehl has cogently argued that our view of human nature should also include chance events: "luck is one of the most important contributors to individual differences in human suffering, satisfaction, illness, achievement, and so forth, an embarrassingly 'obvious' point that social scientists readily forget" (Meehl, 1978, p. 811).

Over the last 20 years, a number of suggestions have been made for how we might expand our view of human beings, such as human agency (e.g., Howard, 1984), phenomenological perspectives within language (e.g., Patton, 1984; Pepinsky, 1984), cognitive mediational processes (e.g., Martin, 1984), and information processing (e.g., Heppner & Krauskopf, 1987), particularly in nonlinear causal chains (e.g., Ford, 1984; Maruyama, 1963). It is striking that all these suggestions are process-oriented, thus suggesting that it may be fruitful to examine more dynamic and microscopic processes at this point within counseling research. Our view of human nature also pertains to our worldview, and

assumptions that we make about race/ethnicity, age, gender, socialization, social class, sexual orientation, and those who are physically challenged (see APA, 2003). Our worldview also tends to be culture bound, or related to our cultural background, which often makes it difficult to understand the human nature in cultures quite different than our own culture. The major point here is that our view of human nature affects the research problems we examine in counseling. Thus, counseling researchers must examine their assumptions about human nature and investigate human behavior from a wide range of perspectives. Sometimes other areas of psychology (such as social psychology, developmental psychology, community psychology, and cross-cultural psychology) provide rich sources of information for investigation in a counseling context.

OUR RESPONSIBILITY FOR APPLYING A WIDE VARIETY OF RESEARCH TOOLS Much of the responsibility for adequately applying the scientific method to counseling phenomena rests with researchers. Over 20 years ago, Strong (1984) aptly delineated this issue as follows:

Scientific development in counseling psychology has not been as helpful to the pragmatic enterprise of counseling and therapy as we would like. It would be wrong to conclude that it has not been helpful, as many practices of counseling today have grown out of scientific efforts, such as behavior therapy, relationship skills, and psychological tests. There is a frustration that scientific efforts have had less pragmatic import than desired. I believe that this state of affairs is not the result of inherent limitations of the scientific enterprise, but of inadequacies in our conceptions of the objects of inquiry—human beings and the phenomenon of behavior change through interpersonal interaction. (pp. 472–473)

Although our science has clearly affected counseling practice today, the essential point is that the methods of science are only the tools we use to obtain knowledge about phenomena. A flashlight is a good analogy. A flashlight is a useful tool, but it will shine light only where we point it. If we cannot find the object we are looking for with a flashlight, it does not necessarily follow that we should throw the flashlight away, but rather that we should change the direction of the light. Similarly, our research methods will give us information only about the content we examine. If we are dissatisfied with the results, it does not necessarily follow that we should eliminate the research methods, but rather that we should try new angles with our research methods. It is possible, however, that we may need a bigger flashlight, or perhaps a flashlight that can bend around a corner. Thus, sometimes new research methodologies may be needed to help us acquire new or different types of knowledge. Developing new methodologies or alternative ways of collecting data obviously challenges the problem-solving and creative abilities of researchers. Presently, there are many ideas that we cannot examine adequately because we do not have the appropriate methodologies or measurement instruments. Researchers must be creative and versatile not only in the methodologies they use, but also in the types of data they collect in examining the phenomena that are central to counseling and human development.

SUMMARY AND CONCLUSIONS

The counseling profession helps people with a wide variety of personal, educational, and career-related problems. Most of all, we must be very cognizant that we are working with real people, many of whom need critically important information, and/or are experiencing psychological pain of some sort, and are in need of professional assistance. In this introductory chapter, we have discussed different ways to acquire knowledge in the counseling profession. 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.

Science represents a way of knowing, a way of establishing relevant knowledge bases for the profession. We can debate about the best way of establishing suitable knowledge bases for our profession, and indeed, different underlying philosophical paradigms (e.g., positivism, post-positivism, constructivism, and critical theory) have led to very different beliefs as to what our science should look like. Regardless of the perspective, it is critical that it is understood 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. In this regard, it is 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 our science promotes the development of relevant knowledge bases, it is also essential that the members of our profession are careful in applying our knowledge bases, and careful not to automatically assume that any particular knowledge base about a topic represents a "truth" that can be applied in many cases, across different personal and historical contexts. In fact, we are often at most risk when we consciously or unconsciously assume universal

truths within counseling research and practice. For example, by the 1970s the utility of Rogerian conditions was well-documented and accepted in the United States (see Orlinsky, Grawe, & Parks, 1994). Moreover, in later years research has often documented that the working alliance, which is typically based at least in part on the Rogerian conditions, is one of the best predictors of counseling outcomes (Orlinsky et al., 1994). Not surprisingly, teaching of the Rogerian conditions has been widely adopted in many U.S. counselor training programs, as well as in other countries around the world. During my first visit to Taiwan in 1989, I (Heppner) was quite surprised to hear that counselors in Taiwan were finding that the Rogerian conditions were perceived as helpful but lacking in some significant ways in the process of counseling. My Taiwanese colleagues indicated that in Taiwan's culture, counselors were also viewed as teachers, and that clients typically expected a directive, advice-giving counseling style from an elder counselor/teacher. In essence, although there seemed to be some generalizability for the U.S. research about the Rogerian conditions to Taiwan, there also seemed to be significant differences in the application of the U.S. "knowledge." Later counseling research in Taiwan has suggested that the counselors' active problem solving and resolution of the clients' presenting problem are also important factors in the counseling process (Wei & Heppner, 2005). In sum, although our science is critically important in establishing relevant knowledge bases for the counseling profession, it is equally important to be vigilant in applying even well-documented findings, especially across different social and cultural contexts.

Thus, we end this introductory chapter on the role of science in counseling with two main conclusions. First, the role of science is essential for the counseling profession, not only for the well-being and growth of the profession, but also for its very survival. Second, and equally important,

the ability of the members of the counseling profession to appropriately apply our scientific knowledge to facilitate the development of a diverse clientele is essential; to this end, the ability

of all of our members to question assumptions, biases, and stereotypes, and to think scientifically is of utmost importance, and will be discussed more fully in the next chapter.

STIMULUS QUESTIONS

REFLECTIONS ON SCIENCE IN COUNSELING

The purpose of the following exercise is to promote additional reflection on the role of science and practice in the field of counseling. We suggest you answer each question in writing, and then discuss your responses with a peer in class to further discuss and explore these issues.

1. What do you see as the primary value of science in the counseling profession?
2. Which philosophical paradigm is most appealing to you personally? What do you see as some of the advantages and disadvantages of this paradigm?
3. What is the second philosophical paradigm that is most appealing to you? What do you see as some of the advantages and disadvantages of this paradigm?
4. In what ways do you think methodological diversity is necessary in the counseling profession?
5. What do you see as the most important outcome of research in counseling?
6. What role does your worldview play in how you might engage in research and practice? What do you see as the disadvantages and advantages of your worldview for both research and practice?
7. Given all of the complexities in different philosophical paradigms, which one do you want to learn more about? Why?