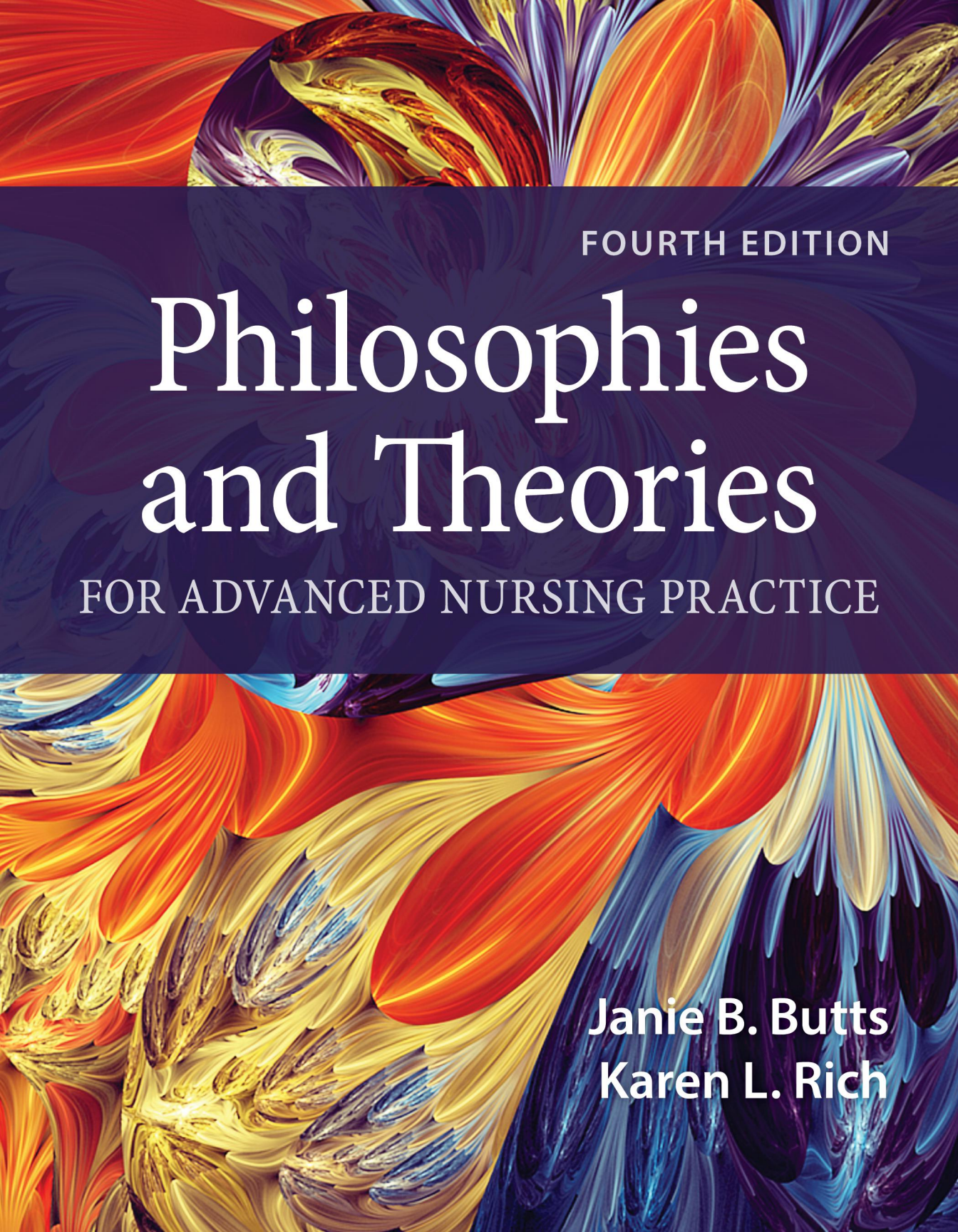
FOURTH EDITION
Philosophies and Theories
FOR ADVANCED NURSING PRACTICE
Janie B. Butts
Karen L. Rich

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Brief Contents

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Preface

Philosophies and Theories for Advanced Nursing Practice, Fourth Edition, edited by Janie B. Butts and Karen L. Rich, is an essential resource for advanced practice nurses and for students in graduate programs, including DNP, PhD, and master's-level programs. Philosophies and theories provide a route or orientation to arrive at one's desired goal or outcome. Favored philosophies and theories guide nurses both personally and professionally, probably more than they realize. Philosophies and theories are not esoteric conjectures; they are meaningful guideposts integral to everyday life.

Arrangement of the Book

The book consists of 26 chapters presented in the following 5 parts:

- Part I: Foundations of Nursing Science
- Part II: The Structure and Function of Theory
- Part III: Interdisciplinary Philosophies and Theories
- Part IV: Select Nursing Models and Theories
- Part V: Tools for Integrating and Disseminating Knowledge in Advanced Nursology Practice

The chapters in Parts I and II provide a conceptual foundation, exploring the philosophy of science, the development of nursing knowledge, and the application of theory to nursing. Advanced practice nurses and nursing students can use Parts I and II as preparation for the information in Part V, which covers theory evaluation, testing, and integrating, translating, and disseminating evidence-based findings from research to practice.

Part III focuses on a selection of interdisciplinary philosophies and theories relevant to advanced practice. Part IV presents select conceptual models, grand theories, and middle-range theories of nursing. Conceptual nursing models and grand nursing theories both bring advanced practice nurses a certain reality of conceptual arrangements, theoretical variables, and propositions used for deriving middle-range theory. Middle-range nursing theories derived from conceptual models and grand theories of nursing translate theory and research findings directly into practice.

Acknowledgments

We would like to thank the Jones & Bartlett Learning staff, editors, and administrators for their diligent work and support. We also thank our colleagues who enthusiastically shared their expertise with us. The authors who contributed to this text are distinguished nursing and interdisciplinary scholars with expertise in theory. Without their contributions, we could not have completed this book. For these reasons, we extend to them a big thank-you!

Janie B. Butts and Karen L. Rich

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Janie B. Butts, PhD, RN, is a professor emeritus at the University of Southern Mississippi, College of Nursing in Hattiesburg, Mississippi, and taught classroom and online nursing courses at the doctoral, master's, and baccalaureate levels. Courses included ethics, advanced theory, advanced practice issues, professional development, research, and professional nursing practice. From 2008 to 2015, Dr. Butts served as a consultant editor for *Nursing Ethics* journal, an international journal with headquarters in England. Specific research interests include death and dying ethical issues. Dr. Butts's journal articles and book chapters include topics on ethics, her research, theory, education, professional issues, and home care ethics, and, before her retirement, she reviewed for top nursing journals and book publishers. Dr. Butts's doctoral degree, with an emphasis in nursing education and nursing science, is from the University of Alabama, Birmingham, and her master's degree, with an emphasis in adult health nursing and nursing management, is from the University of Mississippi Medical Center, Jackson, Mississippi.

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Karen L. Rich, PhD, RN, is a retired associate professor at the University of Southern Mississippi, College of Nursing in Long Beach, Mississippi, where she taught public health nursing, ethics, and professional development. Dr. Rich's doctoral degree in nursing, with an emphasis in ethics, is from the University of Southern Mississippi. She has a master's degree in public health nursing from Louisiana State University and a post-master's in psychiatric–mental health nursing, nurse practitioner emphasis, from the University of Southern Mississippi. Before her retirement, Dr. Rich served as a consultant editor for the international *Nursing Ethics* journal. She served on the ethics committees of a large county hospital in Gulfport, Mississippi, and a private hospital in Biloxi, Mississippi. Dr. Rich has written numerous articles and book chapters about ethics and philosophy. Her special interests are communitarian ethics, virtue ethics, ethics in public health, Eastern philosophy and ethics, and critical thinking in nursing.

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Examples of Philosophies, Theories, and Models and their Application to Research, Projects, and Practice

The following table includes philosophies, theories, and models and a few suggested applications for research, DNP projects, and practice. Nursing theories, which have more obvious applications, are not included.

Readers are invited to consider the uses provided and expand the table with their own ideas!

Philosophy, Theory, Model*	Research, Project, and Practice Examples
*It is recommended that nurses identify and use original and foundational works by authors, philosophers, and theorists when using the philosophies, theories, and models listed below. It is ideal to use primary sources in scholarly work.	
Affective Events Theory	Focuses on affective (emotional) experiences in the workplace Uses: Influences of affective events on job satisfaction in the workplace Mobbing (workplace bullying) and other affective influences on nurses' job satisfaction and job retention
(Implicit) Bias in Healthcare Model	Hidden stereotypes and attitudes that affect differences and disparities in healthcare delivery Uses: Identifying or addressing gender, race, or age-related differences in care Scholarly endeavors aimed at uncovering biases among healthcare professionals
Communitarianism	A philosophy supporting a group's emphasis on working toward a common good versus working toward individualistic aims Use/Questions: Will people wear masks to protect other people during a pandemic because of their interest in the common good versus not wearing masks because they value their autonomy as being more important? Should nurses risk their own health to work when not adequately protected with personal protective equipment (PPE) during a pandemic? What are nurses' attitudes about this issue? Research focused on bullying behaviors Projects and white papers focused on health insurance programs

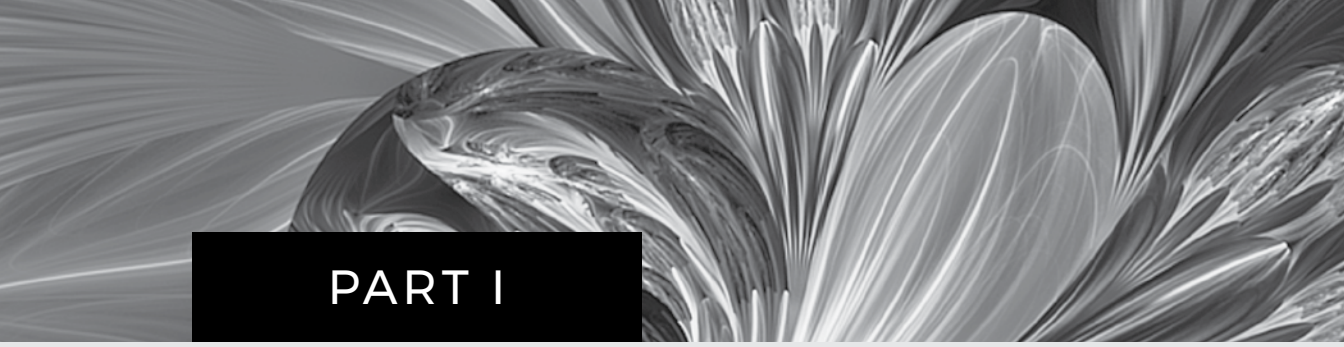
Philosophy, Theory, Model*	Research, Project, and Practice Examples
Complexity Science	Explains simple behavioral rules involved in generating complex behavior Uses: Focusing on concepts such as adaptive responses and bifurcation points as these bifurcation points relate to critical decision making **Organizational Focus**: Influencing factors impacting outcomes, human relationships, systems (unit) relationships and/or functioning, and transition of care points **Leadership Focus**: Considering factors that impact outcomes or human relationships
Consequentialism; Utilitarianism	A popular ethical theory in public health In its simplest application, utilitarianism focuses on doing the greatest good for the greatest number The consequences of actions are important Uses: Limitations of autonomy to maximize positive outcomes for populations Health insurance systems aimed at providing the greatest good for the greatest number of people but such systems might monetarily impact the richest people in a population Note, there are more specific applications that can be considered, such as rule or act utilitarianism
Critical Theory and Emancipatory Knowing	Focuses on power differentials among people Uses/Areas for focus: Marginalization of aggregates and populations Oppression of aggregates and populations Racism attitudes and practices Practices and elimination of misogyny Norms in nursing, populations, or healthcare systems Cultural influences Critical approaches to practice, caregiving, and emancipatory work with individuals and populations Politics and policy Dialectic analysis Reflexivity in nursing practice Advocacy for patients or populations "Ways of Knowing" in nursing Interprofessional collaboration Upstream approaches Health literacy May use with community-based participatory research
Delay Discounting Mischel's Marshmallow Theory	The ability to delay gratification for a greater or better reward or outcome Uses: Nurses' choices to take shortcuts in practice Students' choices to cheat on exams

Philosophy, Theory, Model*	Research, Project, and Practice Examples
Deontology	A theory or approach to ethics grounded in duty rather than consequences Uses/Questions: When and how much do nurses behave based on duty versus character (virtue)? Which do nurses value more, duty or virtue? Issues of autonomy Are "white lies" ever ethical? Duty to tell the truth versus telling compassionate untruths
Ecological Models	Studies or projects involving determinants of health Uses: Issues bearing on the health of populations in regard to factors such as disparities, access to care, socioeconomic status, and behavior
Economic Theories	Studies or projects focused on allocation of scarce resources Uses: Supply and demand issues Cost-benefit analysis Health policy
Feminist and Feminine Ethics	Care-focused and power-focused philosophies concerned with women's interests and traditional feminine characteristics Critiques of feminism and feminist philosophy Uses/Questions: Gender-related moral reasoning Gender issues in nursing education Experiences of "mothering persons" (both women and men) Power as it affects women (political, economic, and/or social forces) Stereotypes as they are applied to and affect women Experiences of female "care workers" "Labors of love" in caregiving Consciousness-raising practice and conversations "Distortions of caring" (being economically, socially, or psychologically coerced to care) Asking, "Do nurses focus too much on self-sacrifice rather than on self-development?"
Gestalt Theory	Studies or projects focused on sensory perception, attention, and unique ways of organizing information and experiences Uses: Differences of perception among different persons, groups, or cultures, such as perceptions of illness Configuration of information Selective attention choices

Philosophy, Theory, Model*	Research, Project, and Practice Examples
Health Belief Model	Motivation for accessing health care Behavior change strategies Uses/Questions: A person's decision to wear a mask or not wear a mask during a pandemic Will particular aggregates or populations take advantage of access to vaccines or recommended screenings? What is an aggregate's or population's motivation for accessing health care?
Incentive Theory	Extrinsic motivation for behavior; reward seeking behavior and/or behavior to avoid negative consequences Uses: Providing a reward as an incentive to move people to complete a particular action; for example, providing a chance in a lottery if a person receives the COVID vaccine Entering research respondents' names into a draw for a gift certificate Studies about how teachers' positive recognition and accolades affect students' behavior
Information-Processing Theory	Processing information rather than merely responding to cognitive input Uses: Pedagogical and andragogical approaches with nursing students and patients
Intergenerational Effects Models	A person's or a population's history perpetuating and predicting the impacts of adversity across generations Uses: Cycles of poverty Cycles of health disparities Impacts of domestic abuse
Justice (Theories of)	Studies or projects focused on fairness and distribution of benefits and burdens Uses/Questions: Health policy Access to health care Health disparities Who should receive scarce resources? How is this determined?
Organizational Theories	Issues of leading and managing organizations Uses: Influences of an organization's culture on workers Analyzing organizational dynamics and impacts Managing organizational change—programs, implementation, effects, and impacts

(*Continued*)

Philosophy, Theory, Model*	Research, Project, and Practice Examples
Re-Engineered Discharge (RED)	A model developed at Boston University Medical Center with over $7.5 million of federal funding RED is a model outlining a high-quality patient discharge process for hospitals This model is an example of one that is specific to a phenomenon of interest. Often, nurses can find relevant models or theories specific to their area of interest Uses: Reducing hospital readmissions Quality-improvement projects Impacts of discharge planning efforts
Social Constructionism, Social Constructivism, and Social Cognition Theories	Focused on knowledge being socially constructed Uses: Molding of shared realities Giving organization and meaning to learning Attending to information based on social factors such as gender, class, ethnicity, religion, and group memberships
Social Learning Theory	Role modeling Uses: Self-efficacy Behavior based on imitation of others Factors influencing behavior
Transitional Care Model	Preventing health complications and hospital readmissions by providing high-quality patient care at transition points Uses: Quality-improvement projects—improving practice at transition points Home follow-up programs Prevention of rehospitalizations Outcomes of nonprofessional healthcare posthospital discharge Transitional care program outcomes
Triple Risk Hypothesis Theory	This theory is an example of one that is very specific to a phenomenon of interest The theory is used to guide investigations focusing on sudden infant death syndrome (SIDS) and also can be used to investigate sudden unexpected postnatal collapse (SUPC) Uses as described above



PART I

Foundations of Nursing Science

CHAPTER 1

Philosophy of Science: An Introduction and a Grounding for Your Practice

E. Carol Polifroni

Introduction

Much has changed since this chapter was written for the first edition of this book. Scholars are discussing theory in ways and forums that we have not witnessed since the initiation of grand theories in nursing back in the 1960s. Yet philosophy discussions have not increased. Even in a world where the question of health is a right or a privilege remains, or whether the coronavirus is highly communicable or not, or what Black Lives Matter really means, philosophy is not being addressed. This is a travesty—one that will limit our ability to grapple with problems and create solutions for them.

We need to embrace philosophy as a part of everyday discourse, as a means to explore the perplexing challenges of society and of human behavior, and as a helpful guide to understanding ourselves and what we believe. Philosophy should not be reserved for academics or students of philosophy; it is part of who we are as human beings and why we do what we do and if and when we do it.

My goal in this chapter is to introduce you to philosophy with regard to science. I view nursing to be a science, so my words are written from that perspective. I believe that the nurse at the point of care is a scientist as they practice their profession wherever they may be—whether in the boardroom, at the bedside, in the home, or in a camp. I also appreciate through dialogue with doctoral students that *science* may be too limiting a word for nursing, but it is all we have right now. Some suggest that we should replace *nursing* with *nursology*, but for me, we need a change in our mindset of what nursing really is before we use a new name. Too many nurses today define nursing as a list of tasks, of things they do, rather than as a profession and discipline wherein all ways of knowing are used and incorporated into their *praxis*.

Philosophy of science (of nursing) is a perspective—a lens, a way that you see the

world, and, in the case of advanced practice nurses (APNs), the viewpoint that governs nurses' behavior in every encounter with a patient, family, or group. A person's philosophy of science creates the frame on a picture—a message that becomes a paradigm and a point of reference. Each individual's philosophy of science will permit some things to be seen and block others. It allows people to be open to some thoughts and potentially closes them off to others. A philosophy will deem some ideas correct, others inconsistent, and still others simply wrong. While philosophy of science is not meant to be viewed as a black-or-white proposition, it does provide perspectives that include some ideas and thoughts; therefore, it must unavoidably exclude others. The key is to ensure that the ideas and thoughts within a given philosophy remain consistent with one another rather than being in opposition.

Discussions of science, philosophy, and the philosophy of science can fill entire books. This chapter introduces readers to these topics. It is constructed in the form of a landscape and is designed to launch inquiry in myriad ways. The purpose is to encourage you, as a nurse, to think in ways that you may not yet have discovered, and to examine your assumptions and actions in your role as an APN. If you leave this chapter without questioning your assumptions, I, the author, have not done my job! One must appreciate the personal assumptions used in everyday professional life. Nurses, for example, must question their assumptions and reaffirm (appreciate and understand) what they believe.

Science

Before the concept of a philosophy of science is examined in greater depth and particular philosophies of science are specifically explored, it is important to begin by developing an appreciation of the meaning of the terms *science* and *philosophy*. *Science,* which comes from the Latin word *scientia*, meaning "knowledge," traditionally refers both to processes and to the outcomes of processes, such as general laws and observations. *General laws* are the laws of nature that guide physical life, such as the laws of gravity, energy, and motion. Generators of science use these laws in a systematic way to create a body of knowledge about a specific topic. The culmination of using the scientific method (the systematic process) provides a set of data (i.e., evidence) supported by propositions about an area of study (Boyd et al., 1991).

Natural (Hard/Physical) Sciences

As an outcome, science is a body of knowledge. Physics, mathematics, and chemistry are three examples of scientific disciplines composed of unique bodies of knowledge. These sciences are often classified as *natural sciences* because they employ the general laws of nature and begin with the physical notion of the world. These natural sciences (which are also sometimes referred to as the *physical sciences*) are also known as *pure sciences*. The word *pure,* in this context, means a unique, definitive body of knowledge. A pure science is independent of others; it is able to stand alone, and it may be developed and furthered for the abstract cause of the knowledge itself. Pure science is not pursued for its utility or value or application per se.

Natural and pure sciences are based on the assumption that reality is objective rather than subjective. As a result of this objectivity, natural science is consistent; in other words, it is reproducible and reliable. Natural science further encompasses the assumption that human beings have the capacity to be accurate and consistent in their objectivity.

Natural scientists believe that explanations (obtained using the method described later in this chapter) exist within the natural or real world. As a consequence, explanations are reasonable, constant and consistent, accurate, objective, discoverable, and understandable.

Owing to its basis in objectivity, natural science is predicated on the belief that there is an external world structure, independent of self, that is grounded in reliability.

Natural physical sciences are referred to as *hard sciences*. In recent years, quantum physicists have begun to integrate the role of the observer into their discipline, which is still categorized as a hard science. This conundrum will be addressed during the discussion of complexity science later in this chapter.

Examples of the physical sciences in health care include the biophysical and biochemical processes related to diabetes, cardiovascular disease, and cancer. Using the physical sciences in health care involves assuming a disease focus rather than a person focus. The science is about diagnosis, treatment, and outcomes of treatment. It is about side effects, and it is about pathology. The concentration is on objectivity, consistent application, and the creation of algorithms of predictability.

Applied (Soft) Sciences

Sociology, psychology, and anthropology are three examples of applied sciences. *Applied sciences* have their own unique body of knowledge, albeit a different one than is found in the natural sciences category. They are known as *applied sciences* because the focus is on the application of related knowledge, usually to meet a particular human need, not to generate knowledge for the sake of knowledge. In addition, the word *applied* is used to convey the understanding that, in the development of their own knowledge, applied scientists use knowledge from the pure sciences. Sociologists, who study people and behavior, rely on and use the natural sciences and their inherent assumptions to further their work. Thus, sociology is an applied science. Mathematicians and physicists do not use psychology or sociology to add knowledge to their scientific disciplines because mathematics and physics are pure sciences, whereas psychology and sociology are applied sciences.

Although applied scientists use what they deem accurate and appropriate from the natural sciences, they do not subscribe to the rigid belief of objectivity and reliability. In applied science, the focus is on human beings and the utility of the science to them and for them. Consequently, objectivity, observation, and reproducibility are diminished or perhaps not present at all. Therefore, the applied sciences are sometimes referred to as *soft sciences*.

Inherent in the distinction between hard and soft sciences are certain assumptions and beliefs. Hard scientists assume objectivity, whereas soft scientists do not. Hard scientists operate from a belief in an external world structure independent of self, whereas soft scientists do not. The hard sciences are grounded in a worldview based on reliability and consistency, in contrast with the soft sciences, which allow for individuality and originality. These distinctions are not minor semantics, but rather indicators of major differences in philosophy and perspective.

Examples of using the soft applied sciences in health care can be found in social work, the work of a psychotherapist, and the examination of healthcare disparities between people of color, the wealthy, and fragile elders. Some state practice acts define nursing as specialized knowledge integrating both the physical and social sciences. In these instances, the acts combine the concepts of hard, soft, pure, and applied sciences.

Human Science

In addition to the categories of science discussed previously, human science is an important type of science. Few scholars would choose to classify human science as either hard or soft, but rather might prefer to classify it as something totally different. *Human science* is not a new term. It was introduced by Wilhelm Dilthey in the late 1800s (Ermarth, 1978). As a German philosopher, Dilthey was perplexed by the concepts of objectivity and value-free science, which left the person out

of the process. He expressed concern about a science and a subsequent knowledge base that did not include the everyday, lived reality of individuals. Along the way, he created the discipline of human science, which captures human beings and their experiences as the source for knowledge.

With this understanding of human science, the scientist becomes as much a part of the experience as does the participant. This view is in direct opposition to the neutral or value-free experience of the physical scientist, whose life is irrelevant to their work. Thus, the nature and focus of the science and the process and role of the scientist are different when the subject area is viewed as a human science. In the physical sciences, the scientist and the subject are not one. In the applied sciences, the science and the scientist are not necessarily one. In contrast, in human science, they are one; they cannot be separated from each other.

Is nursing a human science? Is the work of the APN inextricably interwoven with the population being served? When nurses speak of patients and families, is this a function of a human science view, or of something else? For nursing to be a human science, nurses must recognize themselves as scientists. The work that they do to provide care to individuals, families, and communities may be viewed through a lens of science that is simultaneously physical (hard), applied (soft), and human. Further, when the nurse looks through the lens of incorporating natural, applied and human sciences, they are embracing all ways of knowing: empirics, ethics, aesthetics, personal, and emancipatory (Chinn & Kramer, 2018).

Scientific Method for the Physical Sciences (Traditional)

As an approach or a method, traditional physical science uses a process of linear steps to solve a problem. Most nurses are familiar with the term *scientific method*, but few appreciate the assumptions inherent within the method itself. An *assumption* is a notion, proposition, or fact that one takes for granted as true and right. The scientific method is based on the assumptions that observation is universal, laws of nature guide every action, and the outcome of an experiment will be useful in predicting, and therefore controlling, the object of the experiment. Being *universal*, as the term is used in relation to the scientific method and science, means that all essences are the same and that individuality does not apply. The laws of nature are those that are connected to the physical world structure independent of human consciousness, such as the laws of thermodynamics and gravity. Control through prediction is the ultimate aim of the scientific method. Control occurs through the accurate and reproducible prediction of events.

The scientific method is more than a linear process to conduct an experiment. Although hard scientists would say that it is value neutral, the scientific method is an interwoven and value-laden approach to solving a problem. Objectivity is a key factor that is used to define and validate the scientific method, and yet what the scientist considers to be part of the process is a value-laden decision, regardless of whether objectivity is used later. Arguments about science being value neutral versus value-laden color the aims of the two categories of science: pure and applied.

Aim of Science

The pure, hard sciences have a single aim: knowledge development for the sake of knowledge development and the search for truth. To the hard scientist, a single truth exists that can be discovered once human beings have the physical capacity to make the necessary discovery. This "single truth" approach is based on a belief that an objective world exists, independent of human consciousness. Traditional science aims to describe and

explain this external world structure. Another aim of the physical, pure sciences is to control phenomena through an empirical approach to scientific inquiry. Control is achieved as a result of the accurate prediction of universal descriptions of outcomes. When it is known, the world can be controlled.

The aim of the applied sciences, by comparison, is the application of knowledge for a specific purpose, thereby yielding utility. Applied science is not focused on generating knowledge for the sake of having knowledge, but rather for the development of applications that can better a situation, improve a process, or change the way in which situations are viewed.

In human science, the aims focus on individuals, families, and communities. The goals of human science may be to improve quality of life, ensure dignified beginnings and ends to life, uncover meaning in everyday life, and highlight the roles of individuals within this examination. The main aim of human science may be simply stated as *to know and understand what works for people to maximize their ability to be fully functioning individuals, families, and communities at whatever level they are able to function*.

Scientific Methods in Human Science

Human science requires different methods. While the scientific method may be applied in the abstract, the end for the human scientist is greater than the sum of the parts. Thus, varied methods are needed. In human science, the scientists and the subject (content area) being studied are treated as parts of the same whole. Therefore, the methods used can be neither linear nor constant. Instead, the methods need to be dynamic, while still meeting the same expectation of rigor found in the hard sciences. Rigor—a notion usually associated with randomized control studies, reliability, and validity in the hard sciences—is not the goal in human science. Rather, contextual consistency, purposive sampling within the population experiencing the essence to be described, validity of questions, a detailed audit trail of data collection and data analysis, and a return to the participants for validation of the message sent and received are emphasized.

Criteria for Science

An important distinction to address is the difference between science and nonscience. This discussion has been going on for centuries. Some scholars may look at human science as nonscience. Pseudoscience—comprising theories that are presented as scientific but not proven with the scientific method or supported by data—is the bane of existence for the hard physical scientist, even though it clearly has popular appeal. Therefore, it is important for the hard physical sciences to demarcate themselves from pseudoscience and, perhaps, applied and human sciences. Five criteria are used for this purpose: (1) intersubjective testability, (2) reliability, (3) definiteness and precision, (4) coherence, and (5) comprehensiveness and scope (Feigl, 1988).

Intersubjective Testability

Intersubjective testability is based on a belief in the value of corroboration, and on the idea that two people who view the same entity in the same manner should obtain the same results; if this criterion is met, the method is objective. Using the word *objective* as a synonym for intersubjectivity means that "the belief is not based on hallucination or deception and it is not a state of mind but truly exists . . . the belief is neither private nor unique. It can be and must be verified . . . and be empirically tested" (Polifroni & Welch, 1999, pp. 3–4).

Reliability

Reliability, the second criterion, means that researchers achieve the same result time and

again when the circumstances of their study have not changed. If findings demonstrate reliability, then the same outcomes are achieved with repeated tests, thereby confirming the beliefs and premises set forth by the scientist. It is the basis for prediction and subsequent control.

Definiteness and Precision

Definiteness and precision, which collectively constitute the third criterion, are words used to convey exactness and rigid adherence to objectivity. Precision is not about approximation, but rather exactness; it is about specifics, not generalities. If experimentation meets the criterion of definiteness and precision, creating the same circumstances for repeated experimentation leads to a reasonable expectation that the same results will be achieved. Definiteness and precision are not about inclusion of the researcher or fluidity of ideas—indeed, they focus on the opposite goal.

Coherence

Coherence (also known as *systematic character*), the fourth criterion, addresses connectedness and wholeness. How do the parts relate to one another to form a unique body of knowledge? Connectedness (the sense of a whole with integrated parts, not disparate ideas) is the coherence required in science, which is not necessarily present in pseudoscience. It is important to distinguish the wholeness of coherence from holism in human science. In coherence, the focus is on the parts and their relation to one another. In contrast, holism in human science focuses on the whole from the outset, not the parts.

Comprehensiveness and Scope

The fifth criterion, comprehensiveness and scope, encompasses the ability of a science to be used for something other than its intended purpose. Comprehensiveness and scope define applications beyond the basis of the planned study and as achieving the expected outcome through appropriate utilization. Polifroni and Welch (1999) explain this concept as follows:

> The thrust of this criterion is the maximum explanatory power of the science and its related theories. . . . A science is not a science if it does not explain and address events and related concerns beyond the issue under study at the present time. (p. 4)

Questions for the Practitioner

The five criteria—intersubjective testability, reliability, definiteness and precision, coherence, and comprehensiveness and scope—serve to separate science and pseudoscience, as well as common sense. It is important for APNs to understand the scientific nature of their work. They should consider the following questions (see also **Box 1-1**): Is nursing a science? If so, is nursing work a pure science

Box 1-1 Questions for Advanced Practice Nurses

1. Is nursing a science?
2. Does your practice meet the five criteria of a science? If not, what criteria do you use?
3. How do you use the concept of universals in your care while making the care individualized?
4. How do algorithms of treatment embrace person-centered care?
5. How are payment mechanisms and the desire to embrace human science in conflict?
6. As population-based care comes to the forefront, what assumptions are needed to provide state-of-the-art care?

or an applied science? Is the care provided to patients, families, and communities done for the purpose of prediction and control? Are there universals within patient care provision? Is there an external world, independent of human consciousness, that colors the care delivered? Does nursing as a science satisfy the five demarcation criteria? Is nursing practice objective?

Philosophy

Whereas science is about knowledge, the term *philosophy* (originally derived from the Greek word *philosophia*) means "love of wisdom." Enjoyment of the thought process, the notion of *thinking for the sake of thinking (How often have you said, "If only I had time to think . . ."?), the examination of ideas, and the search for truth are all part of philosophy. Philosophy also involves a search for meaning; it represents a perspective, and it is a set of beliefs*. Like science, it is both a process and an outcome. The process of philosophy is the critical inquiry and examination of meaning and the method that one undertakes when beliefs are examined, ideas are proposed, and assumptions are challenged.

Philosophy encompasses more than rhetoric; it is the guide by which situations are approached, the viewpoint used to see what is before one, and the method by which one searches for truth, as well as an understanding of what truth is. Philosophy is contextually grounded; it relies on the present but is embedded in the historical past. It is dynamic, it evolves, and it is subtle while simultaneously being overt.

Philosophy captures the essence of a human being, such as the essence of what it means to be a provider in a caring profession. The deliberate use of the word *caring* here indicates a philosophical belief based on the author's experience, gender, and role as a scientist. Philosophy is more than just a belief; it is the *application* of that belief to situations known and unknown. Philosophy is epistemology *and* ontology, the knowledge of and the belief about something. Epistemology is the study of knowing, of determining what knowledge is and how that knowledge is relevant and related to extant knowledge. Ontology is the study of being and of meaning.

All the schools of philosophical thought cannot possibly be explored in a single chapter. One way to undertake a large survey of philosophical thought is to examine the various perspectives in terms of two major schools of philosophical thought: analytical and continental. Analytical philosophers originally were primarily located outside Europe, whereas advocates of continental philosophy emanated from Europe. While the two schools are often discussed in opposition to each other, their discordant viewpoints are actually simply a matter of the philosophers using a different lens, differing approaches, and differing subjects. Analytical philosophy is wedded to objectivity and reproducibility, whereas continental philosophy is about essence and experience.

Continental philosophy is grounded in the viewpoint that the phenomena of interest are deeply embedded in the human experience. *Analytical philosophy*, by comparison, focuses more on the use of the process of logic and rational discourse than on the subject itself. Analytical philosophies include positivism, empiricism, instrumentalism, pragmatism, and rationalism, whereas continental philosophies include phenomenology, hermeneutics, critical social theory, feminism, structuralism, post-structuralism, and postmodernism. Some of these views will be discussed later in this chapter. (See **Box 1-2** for more about philosophical terms.)

Philosophy of Science

The philosophy of science exists at the intersection of philosophy and science—where the two meet to form a new perspective that aims to examine the body of knowledge *and* the approaches to studying the body of knowledge.

Box 1-2 Essential Terminology in Philosophy

Antirealism	Essence	Positivism
A priori	Experience	Poststructuralism
Chaos	Hermeneutics	Pragmatism
Complexity science	Idealism	Priori
Continental philosophy	Logical positivism	Realism
Empiricism	Ontology	Truth
Epistemology	Phenomenology	

Philosophy of science in nursing is an "examination of nursing concepts, theories, laws and aims as they relate to nursing practice. Through such an understanding and deliberate thought, praxis evolves" (Polifroni & Welch, 1999, p. 5). *Praxis* is the planned, deliberate, and thoughtful creation of a plan of action to achieve a set goal. Philosophy of science in nursing explores the meaning of truth, the meaning of evidence, and the meaning of life through praxis.

It is the responsibility of nurses to view science from many perspectives: as nurse scientist; as care provider; and from the perspective of the patient, family, and society. Each perspective potentially offers a different lens for examining the same concept. Each lens brings certain assumptions to the forefront that color both the lens and the object of review.

Analytical philosophers, who are often physical scientists, examine the nature of truth through a lens of objectivity, linear thinking, and rationality. Continental philosophers explore the meaning and nature of truth with an individual lens, focusing on the experience of truth from the perspective of the person (including the scientist), which leads to some subjectivity in the results. These two lenses or perspectives require practitioners to examine their own perspective of truth and ask, "Is there only one truth? Does truth reside in the external world structure independent of human consciousness, or is truth found within the individual and highly contextual? Is there more than one truth? Is truth even a relevant subject for discourse, or should the focus of practice be on the outcomes of treatment modalities?" The answers to these questions enable providers to become comfortable with the assumptions and underpinnings of the various philosophical perspectives.

How Do We Know?

Answering the question "How do we know?" is key to helping anyone understand the philosophy of science. This question can be pondered by considering where knowledge and knowing originate. A first thought is that people know because of tradition: Experiences that happened yesterday color and shape what is known about today. Tradition often shapes experiences into a repetitive pattern of behavior. Authorities also inform what is known. An authority may be a person, a role, or an institution. A police officer is an authority; a college professor is an authority; an institution of higher learning is an authority; so is a church. In addition, doctrine can shape what is known. Without evidence, or in the face of contradictory evidence, those who believe in and practice a religion profess it as their knowing. Reason, without regard for religion or tradition, is yet another realm of knowing. Reason may lead to a path that contradicts religion or tradition; thus, individuals must decide what to believe.

Common sense is also a form of knowing: People know that they become wet when it

rains and, therefore, they should seek shelter. If people do not eat, they know that they will become hungry and should find food. These are two examples of common sense.

Finally, there is science as a way of knowing (*to know = science*). Science is knowledge derived from methods that may be linear or complex (chaotic), depending on the view and approach. Science could be physical science, social science, human science, or nursing science. Science, regardless of type, is how people know.

Analytical Philosophy of Science

Reviewing the analytical and continental categories is merely one way to examine philosophical schools of thought. Other options include using received and perceived views (Suppe, 1977), a historical timeline, and a context of major events in history. Choosing the analytical and continental categories as criteria implies nothing more than a framework choice for examination. It is important to note that continental philosophers analyze, and analytical philosophers examine applications.

The analytical perspective is closely associated with positivism and, more specifically, with logical positivism. Given that a significant amount of what can be read about philosophy today is contrary to logical positivism, it is important to understand that base. Logical positivism is a school of thought that originated in the early 20th century under the aegis of the Vienna School in Austria. That geographic location, while on the European continent, does not mean that the analytical perspective is necessarily associated with continental philosophy, however.

Logical positivism actually began earlier than the 20th century, with Auguste Comte's (1798–1857) view of positivism. Comte, the father of positivism, asserted that human history progresses from the theological to the metaphysical to the positivistic. By the last term, he asserted the *positive* role that the universal laws of nature provided. Following in Comte's footsteps, Leszek Kolakowski (as cited in MacKenzie, 1977) suggested four characteristic rules of positivism: (1) phenomenalism, (2) nominalism, (3) the denial of cognitive value in value judgments and normative statements, and (4) the essential unity of the scientific method.

The major tenets of logical positivism, consistent with the use of an analytical approach to problem solving, require rigid adherence to the scientific method (i.e., the deductive nomological approach), a belief in cause and effect, a solid underpinning of replicability, and an unwavering belief in an external world structure that remains independent of self. It is the final point that provides the platform for the cause-and-effect relationship and the objectivity necessarily divorced from humans and subjectivity.

The noted philosophers, Rudolf Carnap, Herbert Feigl (demarcation criteria), Carl Hempel and L. F. L. Oppenheim (1948), and Karl Popper (2002), developed logical positivism with an aim to affirm the external world structure, solidify a reliance on the inherent laws of nature, and promote the deductive method of analysis to solve a problem. These logical positivists believed in the verifiability principle—the belief that a statement is meaningful only if it is proved true or false through the means of experience (experimentation). They suggested that there is a logical structure of scientific theories, probability is meaningful in science (as opposed to possibility), science is a deductive experience, and the sources of knowledge are twofold (logical reasoning and empirical experience).

A large amount of literature in the nursing field has criticized logical positivism as being too rigid, too deductive, and lacking an appreciation or recognition of the human experience. To overcome these objections, logical positivism eventually segued into empiricism. Empiricism, which relies on the scientific method for the production of truth, held to tenets similar to those underlying logical

positivism except that the empiricist required actual experience. The logical positivist accepted the external world structure, whereas the empiricist, while neither accepting nor dismissing the existence of the external world structure, required that science be generated through the senses of experience. Empiricism is what is commonly called science in today's world.

Over time, both empiricism and logical positivism were incorporated into the received view described by Suppe (1977). The received view of science states that a theory is either right or wrong, that mature or developed theories must be formalized, that a theory must be axiomized (taken apart into propositions and independently tested), that all sciences should be patterned after physics, and that there is a clear separation between theoretical and empirical understandings.

The received view is strongly supportive of the prominence and dominance of physical sciences. It is based on the search for truth, wherein a single truth is desired and identifiable. Put simply, empirical (scientific) methods lead the knower to *the* answer.

This view of empiricism, which is embedded in analytical philosophy, is commonly known as *traditional science*. It is how most people are taught in elementary and high schools throughout the United States. Learning physical science by having opportunities to experience through observation is the gold standard of science, knowledge, and truth. Prediction, using descriptive laws and understanding initial conditions, is the purpose of science for scientists who advocate the received view. Such value-free science relies on a single, universal scientific method. The received view is sometimes known as *realism*.

Continental Philosophy of Science

Whereas the analytical philosophy of science focuses on the search for a single truth through a scientific process of controlled experimentation, the continental philosophy of science is concerned with the connection of an idea to the world around the idea and its historical context. Continental philosophy is not about theories or truths, but rather about the relationships among people, ideas, meaning, and their historical connectedness.

Georg Wilhelm Friedrich Hegel, Wilhelm Dilthey, Pierre Duhem, Paul Thagard, Philip Kitcher (2001), Edmund Husserl, and Martin Heidegger (1962) all have written from the continental philosophy-of-science perspective. Their works focus on the applied sciences of sociology and psychology, the historical approach and context, the understanding of power (Foucault, 1976), and the lived experience of the subject and scientist (philosopher).

Human science is the domain of the continental philosophy of science. As described earlier, human science deals with persons and their connectedness to the world in which they live and the lived experiences of their life. Continental philosophers examine this lived experience in the past as well as the present. Using continental philosophy requires an examination of historical context as much as of what is happening in the present time. Continental philosophers of science believe not in cause and effect, but rather in connectedness and the often-used proverb "Past is prologue."

Phenomenology is an example of a philosophy that emanates from the continental philosophy-of-science perspective. In *phenomenology*, as in philosophy, value is placed on universal experiences. Husserl (1990), a continental philosopher, believed that while human experience is personal, the essence of it is universal. For example, the essence of grief is strikingly similar whether one is grieving the loss of a limb, a loved one, a home, or a pet. For Husserl, phenomenology entails a focus on examining phenomena that appear in the consciousness of the subjects. It is about personal experience; from an examination of such experience, the essences of the phenomena are drawn.

Hermeneutics is another continental philosophy. As a philosophy, *hermeneutics* deals with the interpretation and understanding of a message that is being delivered. The name of this school of thought derives from Hermes, the messenger of the Greek gods. Hermeneutics is characterized by the assumptions that people are social and dialogical beings; culture, language, skills, and experiences create shared understandings; there is a continual circle of connectedness and understanding; understanding precedes interpretation; and the interpreter and the interpreted are seen as one. In hermeneutics, meaning and understanding are identified as the aims of the philosophical inquiry.

Poststructuralism, another philosophy that falls under the broad rubric of continental philosophy, speaks to the premise that the study of structures (above and below the surface of relationships and contexts) must be viewed as a cultural phenomenon. As a result, the analysis is open to a variety of interpretations (and likely misinterpretations). Poststructuralism conveys the message that both the object and its context for creation, development, and evaluation must be studied. This view is similar to that taken by all the continental philosophies, which are based on a contextual grounding for analysis. The assumptions of poststructuralism are typically that the meaning of a message is based on the perception of the receiver, and the person who conveys the message is not necessarily significant in terms of the message itself. For example, this view suggests that an APN is not the important component in the delivery of a message; rather, what is important is what the patient hears and interprets the message to be. This approach serves to equalize the imbalance of power between healthcare providers and patients that is noted in the healthcare field today.

Although the three varieties of continental philosophy described in this section certainly demonstrate some differences, all revolve around context, meaning, and the knowing subject of the discourse or action. Collectively, continental philosophies may also be called the *perceived view*, *antirealism*, or *idealism*. These terms are meant to intrigue the reader and encourage further exploration because the space limitations here do not permit adequate discussion of them.

Perceived View

Suppe (1977) examined the perceived view with a different lens. As with the view evinced by the continental philosophers, who engaged the notion of human science and the human experience in the search for truth and knowing, the perceived view is more fluid and dynamic than the received view. Within the perceived view, theories are neither right nor wrong. This position stands in stark contrast to the verification approach of the received view.

In the perceived view, observation leads to the generation of theory, which in turn is value laden. Both the received and the perceived views rely on observation, but the meaning of this term and the process by which observation is achieved differ for the two views. Observation for the received, analytical philosopher is precise, detailed, physical, objective, and inherently value neutral or value free. On the other hand, for people subscribing to the perceived view, observation involves the use of the senses and the mind. Observation is accurate but does not rely on precision; it is both physical and mental. It is detailed but not necessarily measurable, and it is subjective. Therefore, observation from the perceived-view perspective is inherently subjective. What one chooses to observe is as much a part of the process as the observation itself.

The received view supports the beliefs that progression in science leads to a deeper understanding and that this understanding leads to theories for examination. Perceived-view proponents believe in using different kinds of theories and many methods to obtain truth, although some do not seek truth at all, only

understanding. Whereas following the tenets of the received view requires the use of the scientific method, exploration, and experimentation, proponents of the perceived view use varied approaches to science and seeking truth, such as phenomenology, grounded theory, case method, and hermeneutics. Received-view scientists use the quantitative method in their pursuit of science, whereas perceived-view scientists use methods appropriate to the question asked, which may be quantitative, qualitative, or a mixture of the two.

Box 1-3 What Images Do These Terms Conjure?

Adapt	Ecology	Operate
Check	Emergent	Prescribe
Control	Engineer	Self-organize
Design	Evolve	Work-up
Diagnose	Fine-tune	
Diversity	Industry	

Chaos and Complexity Science

Contemporary philosophers of science synthesize the work of both the analytical and continental philosophers into a new and emerging philosophy of science. The emerging philosophy incorporates chaos and complexity science, which is closely aligned with quantum physics. Truth, the domain of the analytical scientists and philosophers, and understanding, the realm of the continental philosophers and scientists, come together in a different and dynamic way in chaos and complexity science. Complex adaptive, dynamic systems (whether organic or inorganic) are connected to environments and are influenced by what has come before and what will come after; these systems are irreducibly whole.

Complexity science and a view of complex adaptive systems with the language of fluidity and dynamicism push the scientist to look at things differently. Is there a real difference—not just a semantic difference—between the images conjured up by the terms *fine-tune* or *emergent* or *work-up* or *evolve*? (See **Box 1-3**, for examples of such terms.)

Bohm (1980) stated that the "universe is no longer seen as a machine, made up of objects, but rather pictured as one indivisible whole whose parts are essentially interrelated and can only be understood as patterns of a cosmic process" (p. 29). There are many assumptions about complex adaptive systems, and they include the characteristics of embeddedness (meaning patterns that can be traced backward and forward), distributed control (an equalization of power bases), nonlinearity, multidirectionality, emergence in the dynamic diversity of subjects and objects, a simultaneous coexistence of order and disorder, and outcomes that are inherently unpredictable. This perspective stands in direct contrast to the notion of traditional science, which aims to explain and predict in order to control.

Summary

There is so much more to philosophy of science than what has been presented here. Nurses embody philosophy in their actions when they enlist their knowledge, ethics, and whole being in the care of others (Bruce, Rietze, & Lim, 2014, p. 70). Entire schools of thought have not been addressed because the purpose of this chapter is to offer a landscape view to allow you to appreciate the role of philosophy of science in your everyday work, not to discuss every philosophical school of thought.

Throughout the chapter, several underlying questions have colored all else (See **Box 1-4**): What are the assumptions of each nurse's philosophy of science? Do nurses aim to diagnose and treat illness, or to diagnose and treat human responses? Do nurses aim to control

Box 1-4 Provider Questions

1. What is my view of truth?
2. Are there multiple truths?
3. What if my patient and I do not agree on the truth or have the same view of truth?
4. Is the lived experience important?
5. Is the lived experience more important than lab values and blood gases?
6. How do I justify/juggle evidence-based practice guidelines and individuality?

through prescription, or do they aim to understand and cocreate meaning and action? Is there a single way to resolve a problem, or are different views and approaches permissible? Is one's praxis dynamic and wedded to a guideline, a critical path, or a set of standing orders? What do nurses need in order to be the best practitioners they can be? What do patients, families, and communities need? Finally, each nurse is encouraged to ask, "Am I the nurse that I want to be?"

Discussion Questions

1. What are the assumptions that color/shape my approach to care?
2. Describe the disruptive change needed within health care to address the major issues facing us today.

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CHAPTER 2

The Evolution of Nursing Science

Beth L. Rodgers

Introduction

In discussions of nursing, images that commonly come to mind are those of the nurse performing acts such as listening to blood pressure sounds, changing a dressing for a wound, assisting someone with ambulation, giving medication, or starting an intravenous line. Undoubtedly, people who have been registered nurses for some time recall their early days in school and the tremendous anticipation of performing their first immunization or urinary catheterization, or the excitement they felt the first time they inserted an intravenous catheter smoothly and successfully.

Nurses who have been engaged in the broad professional role of the registered nurse recognize that there is a great deal more to nursing than the performance of those tasks. Nonetheless, when talking about nursing, the discussion often turns to a focus on what nurses *do*—the skills, tasks, and functions that are associated with their actions and behaviors. Much less common is an emphasis on what nurses *know*—the knowledge base that underlies the performance of those acts—as well as the many other things that nurses do beyond obvious physical functions. No doubt, it is much easier to describe the mechanics of listening to breath sounds than it is to describe the detailed thinking that goes into formulating a holistic portrayal of an individual patient, for whom those breath sounds are only a small part of his or her scenario.

Nurses participate in a variety of actions that are far subtler than those involving the common skills that are directly observable. For example, they form important relationships with patients to help them achieve their health and wellness goals; they counsel, educate, guide, facilitate, assess, plan, relate, evaluate, and engage with people as individuals or in groups or communities on a variety of levels, consistent with a holistic approach to health concerns and health promotion. Nurses also engage in activities such as arranging for referrals, managing various stages of care, and facilitating access to necessary resources. This list is in no way exhaustive, but it provides some indication of the tremendous number of cognitive activities associated with nursing. These actions also are done not as simple tasks, but as the result of complex decision making based on the intricate details determined through a

comprehensive assessment of each situation. Because these activities lack implements or other tangible equipment, the cognitive work of the nurse may be recognized less readily by the public. This lack of recognition is compounded by the fact that nurses are not typically thought of in terms of their knowledge base, unlike other professions where there is more awareness of education and knowledge. Nurses have perpetuated that lack of awareness by being less quick to describe their knowledge, possibly because of the difficulty associated with articulating the specific thought processes that are essential for effective and appropriate care. Many nurses seem to give themselves less credit than is warranted for the cognitive capabilities and knowledge that go into nursing. When asked why they reacted to a situation in a particular way or what prompted them to intervene, it is not uncommon to hear the nurse say, "I just knew," referring to a gut feeling or intuition as the basis for significant action.

These responses on the part of nurses fail to give credit to the vast amount of knowledge that nurses carry with them every day. It is not the tasks and skills that nurses perform that make them such an indispensable part of health care, but rather what they "know." The knowledge of nurses not only lies at the root of giving competent and effective care, but it also provides the foundation that makes them essential contributors to broader decision making and planning. When nurses argue that they should be involved in committees, on boards, or in other influential positions, and when they discuss why certain concerns or problems clearly could benefit from nursing involvement, it is their knowledge that makes these arguments so meaningful. Although nurses often find themselves in a position of needing (or at least wanting) to articulate what is unique about their particular level of preparation, discussion of the knowledge base of nursing can be a challenging undertaking. It is much easier to describe what nurses do than what they know.

The Impact of the Doctor of Nursing Practice Degree

As nurses have achieved higher levels of education (particularly doctoral degrees), the need to understand the knowledge base of the discipline has become even more imperative. Nurses with doctoral-level education are likely to be perceived as leaders in both the discipline and the broader community, and they should be prepared and willing to assume roles as leaders in a number of contexts. They often are confronted with both the opportunity and the need to explain what constitutes nursing at that level. No doubt this need will persist and most likely will expand greatly as more nurses with doctor of nursing practice (DNP) degrees work within a variety of settings. The DNP is an advanced degree, which surely will grab the interest of the public, whose familiarity with nursing is most likely limited to personal experience with hospital or clinic nurses (i.e., nurses who have completed shorter programs leading to obtaining a license as a registered nurse). In addition, it is a relatively new degree that carries with it credentials and titles that are not known to the broader public, and that are perhaps also not well understood within nursing. At the same time, nurses with the DNP degree are in an important position to serve as leaders in the continuing articulation of the discipline, as well as contributors on multiple levels to the development of the knowledge base for nursing.

All these factors create a tremendous need for nurses at all levels of preparation to articulate with clarity the nature of nursing knowledge and what nurses are capable of contributing to health in all realms—individual, family, local, community, and global. DNP-prepared nurses have a particular responsibility to assume leadership roles to represent the discipline and profession of nursing well and to identify and discuss the particular expertise and advanced

knowledge of the DNP-prepared nurse. In addition, nurses with the DNP degree often are in an important position to collaborate with researchers and to identify both needs for research and innovations that add to the knowledge base of nursing as it continues to develop as a discipline. Similarly, they play a key role in implementing new knowledge for the improvement of healthcare access and delivery. All these responsibilities point to the importance of the DNP-prepared nurse's understanding the nature of nursing and the knowledge base of the discipline.

Science and Knowledge

Without an understanding of the overall discipline, including the knowledge that underlies the thoughts and actions of the nurse, both practice and research can become isolated, individualistic, and situational endeavors. *Science* is the general term used to refer to the knowledge base of a discipline that has been developed rigorously and systematically. The idea of science has an interesting history, however, and *science* was not always the dominant term used to refer to credible knowledge. As evidenced by the writings of Aristotle, for example, and in the work of many others continuing into the 19th century, the terms *science* and *knowledge* were used almost interchangeably for much of recorded history. It is only in modern times that science has been recognized as a rather specialized form of knowledge, replete with specific methodologies and means to evaluate credibility. In exploring the underpinnings of nursing work, especially those elements that provide nurses with valuable and trustworthy information as a foundation for practice, it is helpful to look at not just science, but also the broader realm of nursing knowledge.

The discipline of nursing includes components other than just the knowledge base. Disciplines also involve a human component, in that people make judgments about what is acceptable science and what are the current priorities. This component necessarily involves the expression of the values embodied in the discipline with regard to what is needed for knowledge development. The human component, which Toulmin (1972) referred to as the "profession," works with and develops the knowledge base of the discipline and develops mechanisms for the sharing of ideas through debate and dialogue, both oral and in the form of publications. Organizations within the discipline provide leadership, whether through societies that have bestowed honors upon esteemed nurses, research organizations that promote the conduct of research and dissemination of results, or specialty organizations that shape practice. Those organizations also play important roles in the ongoing development of nursing as a discipline. Discussion of the science or the knowledge base of nursing cannot be carried out without recognition of the context that exists for that knowledge in the discipline. In addition, this nursing context exists within a larger societal context that includes expectations for nurses and standards for what is considered to be knowledge or science (especially "good" science).

It is easy to identify examples of how knowledge has changed, sometimes rapidly, and just as often in radical ways. Recent discoveries related to genetics are stimulating revolutionary developments in treatment, as well as renewed efforts at prevention as that genetic knowledge evolves. Dietary guidelines are evolving as awareness develops that blood lipid profiles are not inextricably linked to dietary intake of fats, with new information being in substantial opposition to the prevailing ideology about nutrition and illness. Awareness of the effect of environmental conditions and artificial substances on health and the development of health problems has raised questions in areas that were not given much consideration in the prior germ theory–oriented approach to medicine—questions ranging from food production to vaccination

guidelines. In such a context of ever-changing science, often accompanied by competing values and priorities, significant challenges are presented for nurses who not only provide best practices in their realm of work, but who also must defend those practices in the face of changing knowledge.

It is clear that context has a considerable influence on the discipline of nursing and the development of the corresponding knowledge base. Because of that influence, it is reasonable to look at the evolution of nursing knowledge using a chronological approach; in fact, many aspects of context are associated with historical events and timing. One limitation associated with such a chronology is that it gives the impression that change is linear. That would be a rather naive view, however. Science is inextricably tied to human behavior and attitudes; given that science is a human enterprise and multiple stakeholders and influences exist, the development and change of knowledge over time are far from linear. In contrast, the movement of knowledge often involves multiple and simultaneously existing and competing areas of focus influenced by diverse philosophical systems and sets of values.

Nonetheless, early ideas do provide the impetus for later ideas; societal needs and expectations at one period of time eventually lead to other sets of ideas. As such, there is continuity in the progression of ideas, and that continuity provides a useful framework for studying the history of ideas about nursing science. It is important to keep in mind that changes in ideas and emphasis must be considered as an evolutionary process, and not necessarily a progression. The word *progression* implies movement toward some specified point or goal, such that it is possible to say that nursing knowledge or science is getting closer to whatever that goal might be. Because of the fluidity of the context of nursing, as well as the context of the greater society, that end point or goal must be amenable to change as well. Although the evaluation of progress with regard to knowledge is a difficult task, nurses can say with certainty, and perhaps with pride, that there have been incredible improvements in educational preparation, leadership and organization within the discipline, and the ability to address the changing needs of the people who are the beneficiaries of nursing care.

This element of continuity also needs to be examined from the standpoint of ideas about nursing. Nursing has existed since the beginning of time in various forms, depending on how it is defined. Nursing also exists in a global context despite the variations that might exist from one setting to the next, even within general geographic regions. It is tempting sometimes to avoid defining nursing, or making clear statements about what nursing "is" because of these variations. However, there are some things that enable all these disparate situations to be thought of as nursing. Despite all these differences, there are some things that hold nursing together as a distinct type of knowledge and work; some essence persists across time and contexts and makes it proper to call these things "nursing." Leaders and scholars in nursing have the obligation to be able to discuss the field with others who may have different perceptions of it, and be able to articulate to others the nature of nursing and the incredible contributions to human health that can be made by those who are registered nurses.

Nursing as a Discipline

Despite the tremendous contributions of nurses to meeting the healthcare needs of individuals, groups, and populations, and despite the pervasiveness of nursing throughout much of history, it can be difficult to delineate clearly what constitutes nursing as a discipline. Problems articulating the nature of the knowledge base of nursing can give the impression that there is not a specific, unique substance of knowledge or science that underlies the practice of nurses. Such claims might seem absurd

to any nurse who has been carrying out acts of nursing for an entire career. While it should be self-evident that nurses cannot act without some base of knowledge—otherwise, their actions would be totally without reason—significant challenges have arisen as they have tried to articulate precisely what constitutes that knowledge base.

This desire to define the knowledge base of nursing has been enhanced by some authors, who have argued that it is essential for the continued viability of nursing to distinguish its knowledge base from that of other disciplines (Feldman, 1981; Smith & McCarthy, 2010; Visintainer, 1986). While such concerns are not voiced in nursing as frequently today as they were a few decades ago, lingering questions persist about precisely what constitutes nursing and what reflects or represents some other field of knowledge or inquiry.

To respond to these concerns, unique languages have been created in the form of nursing diagnoses and other taxonomies, and research has been conducted rather extensively on intuition and clinical decision making in nursing. Nurses have focused on aesthetics, empathy, and caring as a way to capture what some consider the unique essence of nursing knowledge. These and other themes evident in the evolution of nursing science reflect the ongoing quest by nurse scholars to answer questions about the nature of nursing, and especially the knowledge base or science that constitutes the discipline. Rather than wonder why so much time is spent debating the nature of the discipline, nurses at all levels can be excited that the quest continues, with new ways of thinking about nursing that add clarity and richness to the discussion. Some of the more recent discussion builds on previous work regarding nursing's metaparadigm (Bender, 2018) or provides creative insights into new ways of thinking about nursing that reflect newer trends in philosophy and social and educational theory (Chinn & Falk-Rafael, 2018; Willis & LaCoursiere-Zucchero, 2014). Nurses with DNP preparation should be aware of this discussion about the nature of nursing so that they can contribute to further the development of ideas about the discipline, as well as to reflect the development of nursing ideology in their interactions with professionals from other disciplines.

The Education of Nurses

As noted previously, concern has been expressed in nursing literature, especially from the late 1960s through the late 1980s, about the apparent lack of a unique knowledge base for the discipline. At other times, critics noted a failure to articulate what makes up that unique knowledge. No doubt, the history of the development of nursing supports concerns about the existence of a distinct, unique knowledge base in the discipline. Education for nurses has been referred to historically as *training,* a term that was particularly relevant during the apprentice-type model of early nursing preparation. Despite Florence Nightingale's revolutionizing the preparation of nurses in her day, a substantial portion of the preparation of nurses occurred through on-the-job apprenticeships well into the 20th century.

Nurses educated as recently as the 1970s (and sometimes even more recently) may still refer to their preparation as "training" rather than as "education." While these semantics might seem like a minor point, terminology can be quite powerful in its ability to convey unintended messages, as well as those desired by the speaker or writer. The term *education* carries a different connotation from the term *training*; the latter focuses on the ability to perform certain actions, not on the knowledge and understanding that precede reasoned action. In addition to this distinction, the emphasis in early nursing training was placed on selecting the best candidates to be nurses on the basis of personal characteristics that were presumed to be appropriate; the focus was

not on the intellectual capacity or aptitude for gaining the knowledge needed to be an effective nurse. A review of the conditions for nurse preparation in the early days of the discipline clearly reveals that fortitude and persistence were valued as characteristics essential to successful completion of these preparatory programs. At the same time, rules for nurses mandated subservient behavior rather than critical thinking.

At the time that nurses began to receive formal education through actual involvement in classroom work and didactic presentations, much of the content of nursing programs was taught by physicians. Programs were associated with hospitals rather than colleges and universities, and the learning of the skills associated with nursing continued to occur primarily by actually doing the work of the nurse. Nursing was not associated closely with academic settings until 1909, when Richard Olding Beard successfully integrated the nursing program into the formal academic structure of the University of Minnesota. This program led to a 3-year diploma and was subsumed under the medical school, and yet it was the first instance of nursing education being an official part of a university structure. Yale School of Nursing, which opened in 1924, was the first autonomous school of nursing, with its own dean and budget (Kalisch & Kalisch, 1995).

Education at the graduate level developed slowly within the context of academic settings. Master's degrees were available in the early 1930s, yet by 1962, data revealed that only 2,472 students pursued the master's degree in nursing; for the period 1961–1962, only 1,098 graduates were enrolled in master's degree programs (U.S. Public Health Service, 1963). Opportunities for doctoral-level education were severely limited in nursing, and nurses who wanted such preparation typically pursued their degrees in the discipline of education rather than nursing per se. The first programs that enabled nurses to pursue doctoral degrees were established in schools of education at Teacher's College, Columbia University, and at New York University, both developed in the 1920s and 1930s.

As nursing evolved as a discipline, recognition of the need for nurses with doctoral-level preparation as researchers grew, and yet there was almost no opportunity to obtain such education within the discipline of nursing. In 1962, the U.S. Public Health Service began the Nurse Scientist Program to support advanced education to prepare nurses as researchers. Because of the absence of doctoral programs in the discipline of nursing, nurses who pursued their education as part of this program had no choice but to receive their education in other fields. As a result, they typically were socialized into those other disciplines, bringing the perspective of physiologists, sociologists, and educators to bear on their ideas about nursing.

Nurses with doctoral preparation in nursing and increased nursing research activity are relatively recent developments. The first doctoral nursing program was established at the University of Pittsburgh in 1954 and was limited to maternal–child health, with a doctor of nursing science (DNS) program established at Boston University 6 years later, in 1960 (Kalisch & Kalisch, 1995). Because many universities did not support doctoral-level preparation in nursing, doctoral programs often had to offer a distinct degree, typically the DNS or DNSc. Journals devoted to nursing research did not emerge until the 1950s, with an additional surge of activity in this area occurring in the 1970s. It is only within the last 30 years or so that a preponderance of people teaching in programs that lead to a doctoral degree in nursing also have had their own doctoral-level preparation in nursing.

Awareness of this historical development in nursing helps to explain the nature of research that has been done, and similarly, the development of the discipline over the last several decades. It is only within the last two or three decades that the individuals conducting research within the field of nursing were likely to have been educated with degrees in nursing and socialized primarily as researchers

and scholars in nursing. As a result, there has been an increase in research conducted by nurse investigators, with a viewpoint that has been derived from and has reflected a nursing perspective toward the problems addressed by the research.

This brief glimpse into a significant aspect of the history of nursing education makes it easy to see why concerns about borrowed knowledge have played a prominent role in the evolution of nursing as a discipline. This lack of clarity with regard to a unique knowledge base for nursing was compounded by prevailing ideas about the nature of disciplines. Prominent nurse scholars in the 1960s through the late 1970s brought to nursing ideas from education about the nature and structure of disciplines.

Delineating the Discipline

Underlying all this historical activity was a variety of theoretical thinking about knowledge in nursing, including nursing as a discipline, the role of theory in nursing, mechanisms for theory development, and, in more recent years, a broad interest in nursing science and its development. In the early stages, attention was focused on the delineation and development of nursing as a discipline, motivated to some extent by the need to demonstrate the unique aspects of nursing. Early efforts were focused particularly on knowledge development consistent with prevailing ideas about the way that disciplines were structured. This focus on structure likely was a result, at least in part, of close connections between nursing and the discipline of education, and the structure of disciplines was an area of considerable theoretical interest and emphasis in education, particularly in the 1960s. The premise in the literature that promoted this focus in nursing was that the determination of the nature of nursing as a discipline, including its structure and boundaries, would provide direction for continuing development. Donaldson and Crowley (1978) pointed out the need to work on the discipline of nursing, indicating that such investigation would determine "the essence of nursing research and of the common elements and threads that give coherence to an identifiable body of knowledge" (p. 113).

Invoking ideas about borrowed versus unique knowledge, Donaldson and Crowley (1978) argued that much of the basis for nursing was "tacit rather than explicit" (p. 113), and they emphasized the need to ensure that nursing research was actually research in the discipline of nursing, not merely research conducted by nurses. Donaldson and Crowley described a *discipline* as being "characterized by a unique perspective, a distinct way of viewing all phenomena, which ultimately defines the limits and nature of its inquiry" (p. 113). Developing nursing knowledge consistent with this idea of disciplinary structure would make it possible to demonstrate what knowledge was unique to nursing, in contrast to knowledge that might be considered borrowed. Donaldson and Crowley's (1978) work was seen as providing some important direction for continuing knowledge to develop what ultimately could be seen as a distinct discipline of nursing.

As part of their work, Donaldson and Crowley (1978) used an approach to disciplines based on the writings of Schwab (1962) to provide guidance for development of the discipline. Schwab (1962) and others who worked in the area of disciplinary structure (Shermis, 1962) argued that disciplines comprised two components: a *substantive structure* and a *syntax*. The content of the discipline of nursing constitutes the substantive structure; it includes concepts, theories, and other knowledge, principles, and ideas that make up its knowledge base. Research to develop the discipline, therefore, should focus on content according to this idea of disciplinary structure. The syntax includes the methods used in inquiry, as well as means to evaluate the value, credibility, or usefulness of inquiry

done in the discipline. A general perspective, or worldview, provides the context for the substantive structure and the syntax to be brought together as characteristics of the particular discipline. Overall, these authors argued for the importance of delineating a distinct discipline of nursing, ensuring that the substance of the discipline served as a guide for practice, and establishing clear connections between research, the development of the discipline, and nursing practice.

It is worth noting that the approach to disciplinary structure that was advocated in nursing was that of the natural sciences. While this strategy may seem appropriate, it is important to consider that nursing might have developed differently if an idea relative to social sciences or humanities had been employed. This placement of nursing within the ranks of natural sciences became evident again when the philosophy of science known as *logical positivism* began to influence nursing knowledge development beginning in the 1970s, such that greater use of references in the area of natural rather than social sciences (although such works existed within philosophy of science) continues to be found throughout the nursing literature.

The Idea of a Professional Discipline

The focus on disciplines occupied the nursing knowledge literature for some time, providing a framework for a discussion of the uniqueness of nursing. This discussion encompassed topics such as the differences between basic and applied sciences, with nursing being held out as distinct from the basic sciences through its focus on application (Donaldson & Crowley, 1978; Johnson, 1959). The notion of applied science as a key aspect of nursing was captured sometimes through the references to nursing as a *professional* discipline. Professional or practice disciplines were thought to have specific characteristics that set them apart from those without a clear practice component. Thus professional disciplines, such as nursing, were viewed as different from the academic disciplines. A unique characteristic of the professional discipline is the delivery of a service of some sort by those engaging in practice.

It is easy to argue that all disciplines have individuals who carry out the work of the discipline, who teach its substance, and who contribute to its ongoing development. Anyone who applies the knowledge of a discipline is engaging in practice related to that knowledge. The mere existence of people who engage in practice is not sufficient to differentiate a field from other disciplines whose members lack such a component. Nurses have argued that nursing is a "practice discipline" or a "professional discipline" in order to delineate nursing from other disciplines and to rationalize certain constraints or other challenges that set nursing apart from more traditional disciplines. However, describing nursing as a practice discipline is misleading because all disciplines have individuals who apply relevant knowledge. Without such applications, there would be no opportunity for testing, studying, enhancing, refining, or sharing knowledge about a particular discipline. What is important with regard to nursing, however, is that there are social constraints, licensing requirements, and means of public oversight that create a special context for nursing. These aspects are critical to the development of nursing and require important considerations about the process of knowledge development. These characteristics also translate into specific needs for the nursing knowledge base (Dickoff et al., 1968a, 1968b). Merely referring to nursing as a practice discipline may not draw sufficient attention to the aspects that affect its development. Despite these social and legal constraints, however, it may not be beneficial to the development of nursing to emphasize these differences. It is not self-evident that nursing as a discipline is sufficiently distinct from other disciplines in its organization and

development, and a focus on similarities may bring about greater progress in understanding and valuing nursing than would a continuing emphasis on differences. Indeed, failure to recognize the academic basis for nursing practice and the need for ongoing knowledge development may have contributed to the slow acceptance of nursing and valuing of nursing knowledge within university and healthcare settings.

The idea of a discipline having a unique substance, as advanced by scholars in nursing during the 1970s and 1980s, contributed to concerns mentioned previously about whether knowledge can be borrowed. This idea of one discipline borrowing knowledge from another one does not hold up to further scrutiny. First, for something to be borrowed, it must belong to someone or something, and yet it is not reasonable to think of knowledge as the possession of any one person or group of people. Researchers in the field of psychology may have created much of what is known about stress or behavior change, for example, and yet it is clear that there are important connections to physiology, medicine, nursing, and sociology, in addition to other disciplines. Similarly, the members of other disciplines use, expand, critique, revise, and refine what is known on an ongoing basis, often with minimal regard for the origin of the knowledge.

There is some legitimate reason to be concerned about the perspectives that are represented in existing knowledge. To that end, nursing's holistic viewpoint and focus on relationships and contexts could be overlooked if nurses are not involved in the generation of that knowledge. Looked at from another perspective, knowledge developed within other disciplines could fail to address the problems that nurses confront and that are important to their work with their populations of interest. Borrowing and the viability of the discipline of nursing are not the issues here; rather, there is a legitimate concern that knowledge should be generated that addresses the epistemic (knowledge-oriented) needs of nurses.

The idea of borrowed versus unique knowledge may not have much utility or support at this time, but the need to pay attention to the knowledge base of nursing still has considerable merit. Nurses need to have an understanding of their discipline, particularly those who are in positions to help shape that knowledge. Nurses with DNP-level preparation will take roles that enable them to have a significant influence over which knowledge development activities are pursued, and they should be engaged as members of research teams to ensure that the knowledge that is generated addresses areas of need. Because of the advanced practice focus of DNP education, DNP-prepared nurses are especially likely to have meaningful interactions with the public—the recipients of care—and therefore are in important positions to influence public perceptions of nursing. Understanding the current status of the discipline, and particularly the evolution of nursing to the present day, helps to create an understanding of the discipline that can be shared with others, can guide continuing research, and can shape the individual nurse's own perception of the role of nursing and the area of practice.

The earlier brief summary of nursing history points to the continuing emergence of nursing as a discipline, with a body of what can be called "nursing knowledge." While there are occasional references to nursing as being in an early stage of development, particularly in reference to other disciplines, such a characterization does not do justice to the long history that exists of people providing essential health services to those in need, especially in connection with religious orders or the military. Human beings have always needed individuals to whom they could turn for support with health and illness situations, whether that support has taken the form of providing recommended cures of the day or more long-term care. To the extent that certain humans were identified as being particularly adept at providing such care, nursing has existed. As early as the time of the Crusades (the 11th century CE),

efforts were made to provide a means for placing the work of tending to ill individuals in the hands of those skilled at providing the needed care. These early efforts served as a harbinger of nursing that would develop in a more formal sense in later centuries, making it clear that nursing care has been available to people in some form for an exceptionally long time. Although the nursing of centuries ago bears little resemblance to the nursing of modern times, it does support the idea that the practice of nursing is not new or embryonic—a characterization occasionally used to describe nursing's state of development. Contemporary nursing involves formal education with complex substantive content reflecting a variety of disciplines, and yet it is integrated into an approach to health and illness situations that represents the special influence of nursing. Arriving at this point in nursing education and practice reflects centuries of ongoing development.

The Emergence of Nursing Science

As emphasis increased on nursing as a discipline, there emerged a concomitant drive to develop what can be referred to as *nursing science*. This emphasis became the specific focus of theory development for nursing and was the primary consideration in the development of the discipline from the 1960s through the 1980s. This section and subsequent sections describe the major traditions in epistemology that have influenced the development of theory and nursing science (see **Box 2-1**).

A review of nursing knowledge development over the latter half of the 20th century shows the steady and profound influence of logical positivism. Logical positivism produced a lasting impact on nursing knowledge development, with one particularly strong example of its influence being extensive theory development activities from the late 1960s into the 1990s. Nurses who received their doctoral-level education in fields other than nursing were influenced by the dominance of this ideology at the time, a factor that helped to ensure its translation to a nursing context. Logical positivism, in fact, was pervasive throughout all the sciences and has had a lasting impact on broad societal ideas about science and what constitutes appropriate or acceptable scientific activity. Logical positivism no longer occupies the forefront of philosophical thought about science; in fact, Webster et al. (1981) declared it dead in the early 1980s. It is questionable, however, whether any philosophical movement ever dies completely, and there can be no doubt that the influence of logical positivism persists and has played a major role in shaping current ideas about science.

Logical positivism placed great emphasis on the demarcation of science from other forms of knowledge. Science was characterized as developing in a cumulative and linear fashion, with successive studies building on prior research. This process was oriented toward continuously refining and building theory in the quest for parsimonious statements that accurately corresponded with reality. Science, in essence, was seen as a theory-building activity, with the ideal theoretical statements being those that were capable of expression using the rules of logic and mathematics. Theory formed the core of scientific activity, and investigations represented an attempt to further develop, refine, or verify existing theory.

Box 2-1 Epistemologies in Nursing Science Development

Logical positivism
Historicism
Postmodernism
Phenomenological philosophy
Hermeneutics
Feminist epistemology
Pragmatism and neopragmatism

With this emphasis on theory, it is easy to see how a discipline that lacked specific theoretical statements and clearly delineated bodies of theory might have been hindered in its efforts to gain recognition as a scientific discipline. If science is a theory-building activity, then nurse scholars suggested that there must be a theoretical foundation for nursing knowledge and practice for the discipline to be considered a science.

The Theory Movement in Nursing

Nurse scholars and leaders devoted considerable effort to identifying the core or essence of nursing, to constructing theoretical formulations that would reflect this core, and to promoting further inquiry, as well as theory-based nursing practice. Federal funding was provided during the 1960s to support a series of conferences on theory development. The first conference was held at Case Western Reserve University in 1968; the second was held at the University of Colorado in 1969. Papers and discussions at these conferences clearly revealed the focus on the science of nursing and the influence of the philosophy of logical positivism on such activities during this time. The theoretical activity that took place under this influence amply illustrates the impact of logical positivism and this philosophical movement in the evolution of nursing as a discipline. Early nursing theory development activities, reflected in the work of Orlando (1961), Rogers (1970), Roy (1970, 1971), and others, served as important milestones in the effort to develop a theoretical basis for nursing.

Developing the status as a science required not only the identification or development of theory for nursing, but also the use of existing theory as a basis for research. Logical positivism, after all, required that scientific activity focus on development and further articulation of theory. Descriptive research—that is, inquiry intended to discover or document events or conditions—did not meet the criteria for science that were espoused by philosophers and the dominant thinking of the period. As a result of this emphasis, the literature of nursing during this time includes a number of articles and ongoing discussions about the necessary connections among theory, research, and practice, with Fawcett's "double helix" metaphor being a particularly poignant example of this focus (Fawcett, 1978, 1985). Writings related to the role of theory in science reflected the tenets of logical positivism; theory development was viewed as a very formal activity, with a focus on axioms and propositions in the construction of theory. Reynolds's (1971) *A Primer in Theory Construction* is referenced frequently in the nursing literature of this era and shows an emphasis on the development of formal theory, the importance of concepts being defined in operational terms to show their means of empirical testing, and a focus on quantitative testing of hypotheses derived from the theories. Research with an emphasis on describing situations or phenomena was possibly of some value, but only to the extent that it provided baseline data for further theory development (Fawcett, 1978, p. 60).

Science that was developed according to the tenets of logical positivism represented what is sometimes referred to as *hard science*, and yet nurse scholars and leaders in the area of knowledge development encountered considerable difficulties with this philosophy, in that a significant amount of nursing was not amenable to this conception of science. Despite the great strides that were made during this time in developing the scientific and theoretical foundations of nursing, some aspects of the field just could not fit these specific criteria. Nursing had maintained a long history of being regarded as holistic, humanistic, and relational, with an emphasis on psychological and social aspects of health and wellness, as much as physiological and biological aspects. Concepts such as dignity,

empathy, presence, and caring could not be forced into the mold of logical positivism without tremendous difficulty and, as nurses readily recognized, without considerable disservice to those crucial aspects of the human condition.

The lack of fit between nursing and prevailing ideas about science left nurses with some difficult choices. One option was for nurses to strive to meet the criteria of science as defined by the logical positivist philosophers. This endeavor, however, would require forcing some elements of nursing knowledge to meet the requirements of the prevailing ideology. Needless to say, this option was akin to the "square peg and round hole" metaphor, and it is debatable whether some of the highly valued aspects of nursing could ever be recast in this fashion without significantly changing their nature.

As a second option, nurses could argue that some components of nursing fit the idea of science, maintaining the logical positivist idea, while acknowledging that other aspects did not fit this ideology. Those other aspects are referred to as art: The dogma of nursing as "an art and a science" (Rodgers, 1991) persists throughout the history of modern nursing thought.

As a third option, nurses could accept that the knowledge base of the discipline, in its totality, did not meet the requirements of logical positivism. Carper's (1975, 1978) widely cited work identifying patterns of knowing in nursing addressed some of these concerns, identifying the empirical knowing that is consistent with traditional ideas of science as only one of four types of knowing inherent in nursing. *Personal knowing, aesthetic knowing,* and *ethics* were terms used to label the other forms of knowing that she argued were essential in nursing. This schema went beyond the mere separation of knowledge into science and everything else (e.g., art) and emphasized the existence of numerous ways of knowing, all of which are essential to the work of nursing.

The Importance of Evaluating Philosophical Ideology

The fact that nurses largely failed to raise questions about the legitimacy of logical positivism as a useful and acceptable definition of science, regardless of discipline, is notable. The challenge for nurses should not have been viewed as only determining how to adopt and follow a particular line of activity or thought. In the case of logical positivism, nurses could have argued—as some did—that this philosophical approach just was not an acceptable or legitimate approach for their field. In fact, there are significant problems with this philosophy, regardless of discipline, even for those that seem to be a more reasonable fit with this idea of traditional science.

Although logical positivism did not present an appropriate perspective for the development of the discipline of nursing, looking only at whether this philosophy "fits" nursing (rather than evaluating its merits overall) has two strong detrimental effects. First, it sets nursing apart as different, and not necessarily in a good way, but in a way that indicates that nursing cannot (or will not) conform to prevailing standards for science. Second, and particularly significant in the case of logical positivism, it fails to address the crucial question of the legitimacy of the philosophy. Without that challenge, a philosophical tradition can continue to be held as an ideal and progress in disciplines can be evaluated relative to its major tenets, regardless of whether a particular discipline accepts that view. Those who rejected logical positivism as a suitable guide for the development of nursing without assessing the philosophy's inherent value created a situation where nursing could more easily be viewed as different, or as a lesser science, than others that appeared to follow prevailing standards. The situation that resulted from

this rejection (perpetuated in the argument that nursing is an art and a science) is similar to criticisms that continue to be levied against qualitative research—namely, that it is "soft" and fails to meet the criteria of "real" science.

Trends and paradigm shifts are always occurring, and the critical questions asked by nurses cannot be limited to whether to follow along as viewpoints shift. The most important questions that need to be asked by nurses with regard to the knowledge base involve two things. First, is the latest ideology sound, not just for nursing but for any discipline? Second, does it enable progress in nursing? In other words, is it an ideology that will help nurse scholars and researchers to make sound moves toward achieving the goals of the discipline? Applying such questions to logical positivism reveals quite quickly that the answer is *no* to both aspects. Indeed, the shortcomings of logical positivism led to its demise as the dominant ideology of science by the mid-1900s.

The ideals put forth by the philosophers of this genre, however, continue to influence expectations and desires in the creation of science in nursing and elsewhere—ideals that have persisted long after logical positivism lost its favored status. Science continues to be seen by society at large, as well as many of the academic disciplines, as a special or unique form of knowledge, with greater credibility than other forms of knowledge. Expectations for widespread generalizability of results, for statistical significance as the measure of meaningful results, for theory development as a focus of scientific activity, and for objectivity and a value-free orientation to inquiry continue to shape both the conduct of research and the needs of the public and others who will apply the results of scientific endeavors.

Webster and colleagues (1981) clearly pointed out the effects of "undue adherence to the positions and ideas of the received view" and noted how that perspective "stilted the development of nursing theories" (p. 34). *Truth*, as a criterion for evaluating theory, particularly in the form of correspondence with facts, presented other problems in the logical positivist viewpoint. The correspondence theory requires that phenomena be objectified—that is, measured in some way that is precise, repeatable, rigorous, and, as is evident in any research methods text, a valid measure of the phenomenon being studied. As a result, the phenomenon is believed to be captured successfully through the collection of empirical data.

Although this goal of precision and high validity certainly is admirable, it ignores elements of phenomena that can be the source of important information but are not reducible to means of measurement. With this approach, grief, for example, could be understood only as "grief as measured by a score on the grief instrument" because assigning numbers to grief is the only means to quantify and validate its existence. An individual's description of grief, including its emotional impact, its effect on daily life, and feelings that are often expressed by people using metaphors rather than checklists or Likert scales could not be included under the heading of scientific.

It is easy to see how social or psychological phenomena are particularly troublesome to study from the perspective of logical positivism because these phenomena have strong personal—or what might be called "subjective"—components. Physiological phenomena, however, are not immune to these difficulties either. Consider, for example, hypertension, measured as the pressure of the blood against vessel walls, or diabetes control, measured with glucose or HgbA1c levels. While these methods clearly are meaningful measures of these physical phenomena, they do not provide a broad or holistic perspective on how these conditions affect individuals with these diagnoses, or what it is like to live with and try to maintain control of these physiological challenges.

There are many challenges with the logical positivist philosophy of science. For the purposes of this discussion, the significant point is to note the barriers to progress in the

discipline of nursing that were confronted as a result of the rise in popularity of logical positivism and a staunch adherence to empirical ways of knowing, particularly within the context of a discipline that derives a significant amount of its identity from a holistic approach to human beings. These challenges also led to difficulties with the adoption of logical positivism in other disciplines. Despite these barriers, however, logical positivism had a profound and lasting role on shaping views of science through the 20th century and beyond. Specifically, the philosophy created expectations for science in both academic settings and society at large that continue to influence the evaluation of knowledge for its applicability and meaningfulness.

Before moving on to address the changes that have arisen since the logical positivist approach became prominent, it is appropriate to reiterate some important points. Methods and philosophy are linked inextricably: The choice of method that a nurse or any scientist takes with regard to knowledge development has strong philosophical underpinnings that need to be recognized as an inherent part of the science or knowledge development enterprise. These foundations are not always obvious, and yet the philosophical position taken by a researcher can be determined by assessing the approach to inquiry that is taken. It also is possible to use similar strategies for inquiry despite different philosophical positions.

When a researcher measures some phenomenon, the researcher is indicating that it is possible and appropriate to measure it. However, one researcher using a quantitative instrument to measure a phenomenon may believe that those measurements reflect true and meaningful data, whereas another may believe that the results are meaningful, but only a piece of a complex human situation, and that the answer to the research question is just one of many possible answers. Logical positivism, for example, undoubtedly leads to a quantitative approach to science, but, conversely, not all quantitative science is necessarily based on logical positivism.

From a philosophical or disciplinary standpoint, it is important to look at assumptions about the nature of reality, truth, the goals and purpose of science, and the criteria that are used for differentiating good science as reflective of the philosophical viewpoint of the researcher or scientist. Those underpinnings are reflected in the methods used, but the methods essentially are tools, and they can be used from perspectives that have some perhaps subtle—but important—variations. The failure to distinguish method from philosophical underpinnings can lead to the wholesale rejection (or, conversely, blind adoption) of alternatives to knowledge development without appropriate thought being given to the choices being made. The responses of nurses to various trends, as evidenced in the literature of nursing, do not always capture this subtle but important difference. Without that understanding, however, there is a tendency to abandon useful aspects of some approaches to knowledge development or to develop a bandwagon mentality when new trends emerge and either become popular or later are found to be insufficient to meet the needs of the discipline.

As noted earlier, the logical positivist approach to knowledge had significant limitations as a focus for the development of knowledge, especially within the narrower realm of scientific knowledge. As a philosophy of science, it not only presented challenges within the philosophy itself with regard to views of the nature of reality, truth, and the proper goal of science, but it was also created as a prescriptive view—in other words, a directive dictating how science should be done. In essence, logical positivism was not comprehensive in terms of how science actually was conducted. Prescriptive approaches can be of great value, of course; this point is clearly seen in health care, where prescriptions for all sorts of things are intended to set people on a healthier and more productive path, just as a prescriptive view of science could have the