

B

Mental Prisms of Leadership

Performance as an educational leader is dependent on how the leader “sees” events, situations, and challenges. The core values of a leader help him or her know how to respond, which challenges to accept or to ignore, and how to shape the practice of leadership in schools. In many cases a leader only “sees” what his or her values permit to be seen at all. This chapter explores the pivotal points of how leaders discern what is good and true, and how to move toward revealing their personal “blind spots,” which all humans possess. It is about peering inside the mind to discern how “reality” is defined prior to perception. Such inquiry is difficult but it is the key to the idea of “critical, reflective practice.” The chapter provides the conceptual tools to engage in that quest for enhanced self-knowledge and it shows what assumptions have been used in the past to anchor leadership thought in education.

The art of leadership is performance. Performance, however, is anchored in the essential core of every leader’s deeply held beliefs that not only guide him or her in a role of leadership, but actively shape the world and define the issues in it. These beliefs are the “mental prisms” in which leadership is defined, situated, and socially contextualized by language and culture. All the beliefs are fixed in what a human being believes to be good and true. So what counts as good and true are the touchstones of educational leadership practice.

The world is not a static entity perceived the same way by everyone. Rather, the world is a dynamic place in which different cultures, languages, and contexts shape perception to become congruent. In other words, “reality” is not “out there.” Rather, reality is “in there,” meaning in the leader’s mind. And the leader’s mind is set firmly within his or her linguistic frame and all its attendant conventions, idiosyncrasies, and cultural blind spots. Between the internal world of the leader and the external world’s demands is the space where any leader decides what to do and how to respond to circumstances. If, for example, an educational leader values the kind of curriculum that

includes the arts, poetry, and literature but sees the accountability laws driving them from the curriculum, what course should the principal or superintendent pursue? The discrepancy between the core values of a leader and his or her role demands make up the agenda for action. It is the lynchpin to define practice (Kelleher & Van Der Bogert, 2006).

We saw in the last chapter the work of political scientist James Barber (1985), who put it this way about the leadership of the U.S. president:

A President's world view consists of his primary, politically relevant beliefs, particularly his conceptions of social causality, human nature, and the central moral conflicts of the time. (p. 5)

Barber (1985) differentiated between a "leadership style," which he defined as a president's way of acting, and a "world view," which is how a president's perception is shaped. "World view" is a president's anchor. It's any leader's anchor. And it's an anchor because it moors a leader in all kinds of weather. The world can be a turbulent place. To keep from being buffeted about, a leader has to be able to ride out the inevitable chaos. Those who follow leaders expect them to offer reassurances, defend their beliefs, and point out a course of action (Barber, p. 6). Leaders cannot perform these functions if they have no idea of who they are, where they are, and what they should be doing.

Ralph Keyes (1995) compiled a book of the wit and wisdom of U.S. president Harry S. Truman (1884–1972), whose stature has consistently risen since he left office. Keyes wrote the following of the 33rd U.S. president:

Harry Truman stands in stark contrast to modern politicians who don't seem sure of what they stand for until they've taken a poll. Harry Truman knew who he was. "I've never met anyone," wrote journalist Charles Robbins, "whose idea of his own identity was clearer than Truman's." (p. 3)

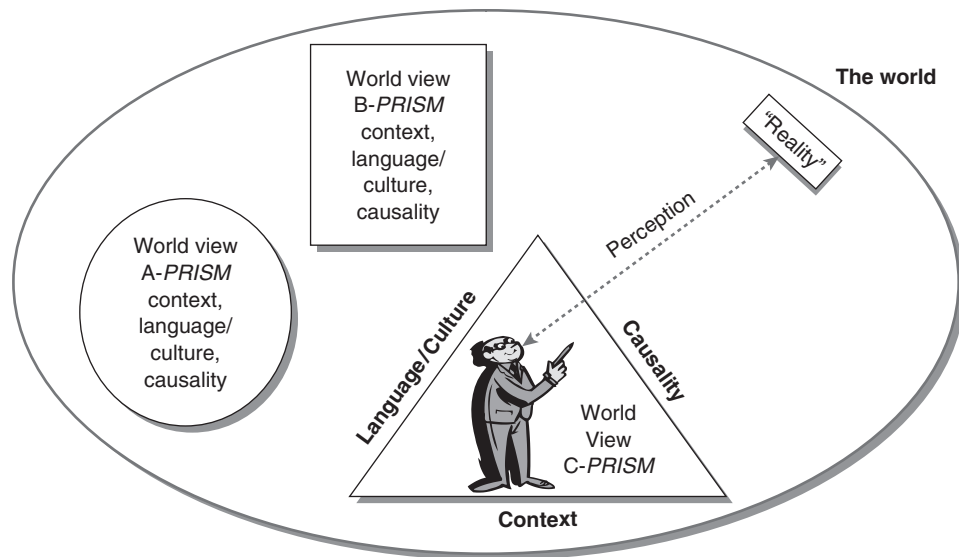
Biographer David McCullough (1992) said of Truman that he held the values of the common American and that "he held to the old guidelines: work hard, do your best, speak the truth, assume no airs, trust in God, have no fear" (p. 991).

The nature of a leader's "world view" is shown in Figure 3.1. This schematic shows that within the world there are different cultures. These cultures possess linguistic/cultural differences that have shaped human perception in them.

Human perception is not a matter of peering through the eyes of a totally open lens. Humans do not "see" what is there. Rather, humans "see" what their language, culture, and context permit them to see. What we see has been actively shaped, just as an artist would "see" a landscape and then paint or draw it. Consider the differences in landscapes between Monet, Gauguin, or Van Gogh. The artist brings to the painting a complex set of understandings as well as mental images that have been preshaped, including political perspectives and gender biases (see Callen, 1995).

The external world is "trimmed" to "fit" the "world view" of the perceiver. As we have seen in the last chapter, "world views" are fed by the psychic forces of every culture's mythos, those primary beliefs expressed in the dominant narratives guiding all cultures.

In the West, the act of observation has become the dominant mode of determining "the truth." The concept of truth, the stuff of facts that were "out there," was well

❖ **Figure 3.1** The Dynamic Nature of Leadership Within Varying “World Views”

implanted in the mind of educational leaders quite early, and is partly accountable for the quest of trying to fashion educational administration into a science early in the 20th century (Culbertson, 1988; Donmoyer, 1999). An example that remains popular today was espoused by George Howland, superintendent of schools of Chicago in 1896, writing under the title of how school should develop human character:

The pupil must know what is true and beautiful ere the conception of truth can dawn upon his mental vision, must learn of the good and the right if ever goodness and righteousness shall be to him more than empty words. (p. 114)

This former Chicago superintendent believed that what is “true and beautiful” are values that exist separately from humans and both must be “taught” to students. These values are clearly outside the student’s immediate experience and must become the “stuff” of school curricula. The other revealing thing about this quotation is that it places “truth-beauty-good-righteousness” as moral equivalents on the same plane. What is one is the other. It never occurs to Superintendent Howland that the truth might be ugly, destructive, or evil. Likewise he apparently never heard of the antithesis, that “beauty is in the eye of the beholder.”

Figure 3.1 demonstrates that perception and notions of truth based on perception are bound, defined, and limited by a person’s language/culture and context. Notions of causality (cause and effect or what leads to what and why certain things happen) are powerful shaping forces to constrain observation. Science, as one form of human knowing, is similarly bound. Paul Feyerabend (1991) said it best: “. . . you have to approach science . . . by tracing . . . life stories . . . analogies there are—but no permanent structures” (p. 156). All cultures are situated not on an immutable intergalactic

platform, but contextually positioned in a specific time and context. To return to former President Truman, for example, David McCullough (1986) reminds us that

... at heart he [Truman] remained a nineteenth century man... He was never really happy with our twentieth century. He didn't like daylight saving time. He didn't like air conditioning. He didn't like the telephone at all; he would use his pen, or pencil. He would far sooner write a letter than use the telephone. (p. 33)

This was Truman's anchor because there are no permanent structures. Everything is fluid. Concepts of permanency are illusory.

Discerning Contemporary Notions of Perception and Truth

Figure 3.1 illustrates that there exist in the world competing perceptions and values regarding causality (shown as world views A, B, and C in the schematic). Causality is linked to historical context, which can be positioned in time and fully cloaked in linguistic/cultural traditions. The human perceiver may not recognize that his or her perception is embedded in and defined by these forces. Edward Hall (1981) describes this immersion as follows: "... his culture, the total communication framework: words, actions, postures, gestures, tones of voice, facial expressions, the way he handles time, space, materials, and the way he works, plays, makes love, and defends himself" (p. 42).

Culture shapes perception from the moment of birth. One has to know what one is seeing to know what it is and to learn the language needed to identify it (see F. Saussure in Gadet, 1986). "Reality" is arbitrarily and inwardly defined. The outward boundaries of "reality" are embedded in the context of time.

Within this very fluid interaction, language shifts are occurring. And the language used by the speaker is a kind of temporal space by which experience itself is separated from the act of observation. A perceiver can be observing a sunset and experience it at the same time. However, when the perceiver realizes that he or she is in the act of viewing a sunset, then he or she is not only experiencing it, but recognizing it as well. In this moment, the human perceiver differentiates the act of sunset viewing from other kinds of acts, and in the process, identifies it using language. This kind of two-pronged act creates the human concept of *time* (see Rapaport, 1989, p. 71).

Within this framework or discourse, language is both a product of, and a determiner of, temporal relationships. Language is both descriptive and prescriptive in this sense—it indicates "what is" as well as "what should or might be." Language cements the hierarchical nature of perceived relationships and other "givens." Embedded in language are concealed hierarchies and power relationships. Humans learn early on their "station" in the social structure. Perception is geared to staying within this structure and coming to see it as "natural," a point underscored by Hall (1981) when he said, "Culture hides much more than it reveals and, strangely enough, what it hides, it hides most effectively from its own participants" (p. 39). Edward De Bono (1972) calls language "our strongest patterning system" (p. 134). People using a language are often unaware of such patterns. Human thinking is shaped not by an independent reality that words represent, but by cultural metaphors without any inherent properties or fixed relations between them (Lakoff & Johnson, 1980, p. 210).

Here are some propositions about the nature of perception and the related idea that humans can perceive something called “the truth.” It is an essential foundation on which an educational leader constructs his or her practice, as Jentz (2006) notes:

... we do not know what we do not know, and a great deal of what we do not know is essential to our success. We can only discover what we do not know by being willing to look inside, making our minds the object of our inquiry. (p. 237)

This chapter is about looking inside our minds at the mental prisms we have erected there and subjecting them to scrutiny “because leadership for change requires pioneering steps into unknown territory in the external world” (Jentz, 2006, p. 237).

Perception and Truth Are Linguistically and Culturally Defined

Perception is neither absolute nor universal. It is encapsulated and relative to linguistic conceptual systems, part and parcel of everyday discourse and specific cultures (Lakoff & Johnson, 1980, p. 159). Because of these temporal and specific cultural conditions, “all observers are not led by the same physical evidence to the same picture of the universe” (called the *Sapir-Whorf hypothesis*; see Whorf, 1956, p. 214).

For example, the Eskimo language has four words for *snow*, the Hopi language uses the same word for *insect*, *pilot*, and *plane*, and some Arabic languages have nearly 100 words for *camel*. Some Native American languages have no noun/verb distinctions, and others have no word for *time*. English makes the words *flame*, *storm*, *lightning* and *spark* nouns, while Hopi represents them with verbs (see Palmer, 1986, p. 45). The ancient Egyptians used a 24-letter alphabet, but all the letters were consonant signs only (see Jensen, 1969, p. 62). What is true is culturally constructed. Truth is invented and hence not “discovered” (Eco, 1990, p. 67).

The invention of truth was forcibly illustrated in 1992 when the Yokohama Rubber Company in Tokyo, Japan, apologized to its Arabic customers for making tires with treads that resembled the word for Allah, the Islamic name for God. The Yokohama Rubber Company indicated that the tread design (called Y-814) was generated by a computer that was searching for maximization of driver safety and was not intended as a blasphemy against the Islamic Deity. The company also apologized for its ignorance of Islam (Associated Press, 1992, p. A3).

In some languages, it is impossible to separate the meaning between a written sentence and an utterance. English is one of these languages (Palmer, 1986, p. 154). A model is provided by Matthews (1965) in which the North American Hidatsa Indian language contains six examples of the meaning of a sentence determined by the mood imparted by the speaker in uttering it. In Hidatsa, if the speaker knows the sentence he relates is true, it is spoken with great emphasis. If this emphatic mood is questionable, the speaker is considered a liar. If the same sentence is delivered in the indefinite mood, it means that he or she does not really know whether it is true. If the sentence ends with a period mood, it means that the speaker believes it to be true. However, if it does not, then he or she did not lie, but was simply mistaken (Palmer, p. 152).

Political relationships are part of all texts since they are “products or inscriptions of the discursive formations of institutions or ideologies” (Felperin, 1988, p. 32). Such

ideologies are usually submerged in the requirements for linearity and sequencing in speech and script. They are therefore “hidden” to those using them, and to those who may believe that they are “open” and nonprejudiced in their perceptions. This “blindness” leads to ethnocentrism, a world view that holds that people who are not like you are inherently inferior. Paul Feyerabend (1991) said the following: “Many people make the mistake of assuming that the world that arose as a response to their actions, or their history, underlies all other cultures, only the others are too stupid to notice” (p. 43).

Lakoff and Johnson (1980) indicate that “absolute objective truth is not only mistaken, but socially and politically dangerous” (p. 159).

Each human culture shown in Figure 3.1 acts on its own perceptions of reality. More than one response works. To survive, human cultures must find sustenance (response) from that reality or “Being.” This is the essential function of mythos that was discussed in the last chapter. Cultures are successful in this endeavor or they perish. This concept underscores the idea that “there is no way of connecting the reactions with universal substance or universal laws” (Feyerabend, 1991, p. 43). The full implication of this linkage is that perception and hence truth are contextually dependent rather than contextually independent of any observation of “reality.”

The necessity of knowing the context to understand if a sentence is true is established by trying to ascertain a sentence’s meaning, independent of context. Usually, a second sentence is required—normally, a paraphrase. But how is one to know which sentence is true, or even if the two are similar without knowing the context in which both would be used (Palmer, 1986, p. 48)?

Eco (1990) affirms Charles Sanders Peirce’s “principle of contextuality,” that “something can be truly asserted within a given universe of discourse and under a given description, but his assertion does not exhaust all the other, and potentially infinite, determination of that object” (in Figure 3.1. as world views A, B, and C; p. 37). This means that perceivers in all three separate world views could make claims about their “realities,” but none of them would exhaust the potentially infinite meanings such claims could generate.

Perception and Truth Are Relational and Circular

“To learn a language is to learn the meaning of its sentences, and hence to learn what observations to count as evidence for and against them,” says philosopher W. V. Quine (1974, p. 38). The meaning of perception/truth depends on a statement’s relations with other statements. The meaning of “red” is established in a network of relationships. A red cloud has no particular meaning in weather systems. However, a red traffic signal does have a specific meaning within a communication system (from Palmer, 1986, p. 3). The fact that “red” means “stop” is purely contained within that notational/communication system. It is relational and circular—that is, other signs and colors are dependent on them for the same reason.

A perception that is considered “true” is positioned within a “web” of other statements and assertions. True statements are linked to others and within larger frameworks or paradigms. These are circular in nature—that is, all definitions lead back to assumptions on which the paradigm rests and also to undefined words, like spokes in

a wheel. For this reason, Popper (1979) has indicated that most theories contain their own “truth” and are therefore unable to predict any situation that involves their own rejection (p. 67).

However, when undefined words are used to indicate meaning in the act of definition (and there is no end to this process called *infinite regress*), boundaries are created for what is considered true to be indexed, like a dictionary within a language. But, since there is no end to the shifting from one word to another undefined one, there can be no final or authoritative, transcendental meaning possible, because such a meaning is infinitely postponed (see Eco, 1990, p. 27).

Perception/truth is confined to language syntax and its content-meaning will vary from language to language. This circularity to “boxed” meanings within languages (not always translatable to others) is reinforced by the fact that languages are indeterminate in categorizing “reality” to the point where “there is no absolute line . . . between what is in the world and what is in language” (Palmer, 1986, p. 32). This concept was reinforced by Dick Littlebear, a North American Cheyenne:

We need our land and we need our language. The two are inseparable . . . There are references to the land that can be articulated only in the Cheyenne language. I believe that once these sacred references can no longer be expressed . . . These vital links will no longer exist in the tribal consequences. (Crawford, 1992, p. B5)

Language indeterminacy shrouds perception and truth in tentativeness, and denies anything resembling a stable “objectivity” within one language or across other languages. It negates the search for causation because decisions are independent of one another and are not connected (although they may be connected in each culture’s mythos). The idea of a “free will” and the arbitrariness of all linguistic conventions is underscored and affirmed by linguistic scholarship.

The discovery of the Rosetta stone is one of the most famous examples of language indeterminacy. The Rosetta stone was a chunk of black basalt found in 1799 at the mouth of the Nile River in Egypt by a French engineer with Napoleon’s army. The broken tablet contained three separate scripts: Egyptian hieroglyphs, demotic (a kind of secular and condensed form of hieroglyphs), and Greek. Inasmuch as the Greek script was describing a royal event (the reign of King Ptolemy Epiphanes, 204–181 B.C.), it was assumed that all three texts were similar (Jensen, 1969, p. 74).

The Rosetta stone promised a way to break the hieroglyphic code of the ancient Egyptians, which up to that point appeared impenetrable to analysts. The translation was a lot more difficult and took longer than anyone imagined. The definitive dictionary of hieroglyphics was not published until 1926—120 years after the Rosetta stone discovery in the land of the sphinx (Jensen, 1969, p. 78).

The first attempt to translate the Rosetta stone obviously moved from the Greek to the second script, the demotic. This involved changing proper names in Greek to proper names in demotic. But this translator incorrectly assumed that demotic was an alphabetical text when it was not. The next move by a subsequent translator occurred in 1815 when a demotic alphabet was created. After this, the move to hieroglyphics was attempted. Again the proper names were deciphered in ancient Egyptian, which

yielded only six hieroglyphic letters with phonetic equivalents. All work then came to a halt. No one could go any further.

The person credited with the breakthrough was a young Frenchman named J. F. Champollion (1790–1832). His diligence and hard work eventually paid off. Champollion's strategy was based on an intensive study of Coptic, one form of linguistic evolution from ancient Egyptian. By comparing forms of Coptic to demotic, and an even earlier type of hieroglyphic called *hieratic*, he could trace the development of the language.

In the deciphering process, Champollion noticed something that contradicted a previous assumption he had made about the Egyptian hieroglyphs. Initially, Champollion thought the hieroglyphs were pure picture script. Then, he discovered that this portion of the Rosetta stone contained three times as many signs as the Greek words contained. It was apparent to him that each hieroglyphic sign could not be a whole word. He worked from Greek to demotic to hieratic and into the hieroglyphs, and then found the name of the king: P,T,O,L,M,I,S. This insight eventually unlocked the secret of ancient Egyptian writing, but even the details eluded Champollion's exacting mind (Jensen, 1969, pp. 76–77).

It was not until 1867 that further scholarly work unveiled the place of determinatives in ancient Egyptian texts. These were certain picture-sign extensions with written phonetic additives that indicated a generic sphere of concepts to which a word belonged. This graphic-phonetic combination limited the meaning to only one of many possibilities. Ancient Egyptian texts therefore contained around 700 different kinds of signs. These consisted of word-picture signs and from some of these determinatives, double-consonant signs for phonetic groups labeled syllable-signs. Others were single-consonant signs or letters.

The dramatic story of the unlocking of ancient Egyptian texts from the Rosetta stone underscores the arbitrariness of language development. It also illustrates the patent difficulties in attempting a language-to-language translation based on the many assumptions of parallelism in human experience, perception of reality, or oral and written expressions and conventions.

Another bit of history regarding the Rosetta stone is supplied by Asante (1990). Because of the prejudice and ignorance of the European historians and archaeologists regarding Africa, the Rosetta stone was believed to unlock the key to ancient Egyptian writing, which was classified in England as an "Oriental" language rather than an African one. Africans were not believed to have developed a written language. Because the Arabs had conquered Egypt by the time the Europeans had arrived on their military expeditions, they saw hieroglyphics as Eastern rather than African, although this ancient language predated Arab conquest (pp. 59–68). The belief that African civilizations were not as advanced as European civilizations in the development of writing is still a prevalent myth, even among educated people.

As a final commentary, when languages are translated, some small points on which arguments may hinge can be lost. In 1925, in the famous Scopes trial in Dayton, Tennessee, when Charles Darwin's evolutionary theory tangled with the Biblical version of Genesis and classroom science teaching (two competing narratives for social myths), the defense team tried to raise the issue of linguistic distortion (English & Zirkel, 1989).

The original Hebrew translation of Genesis did not read, “In the beginning God created the heaven and earth” (remember the J for *Jehovah* version of Genesis cited in chapter 2?). Instead, the literal words read, “When the gods began to set in motion the heavens and earth” (the so-called E or *elohim* version; DeCamp, 1968, p. 178). The difference is significant. In the first translation, it is God who is fusing the materials to fashion a heaven and an earth. In the second, the heavens and earth already exist and the gods (female as well as male) are merely putting them into place. Darwin’s theory of evolution clashes with the J version but not with the E version. Presumably, the E version translated as “set into motion” the heavens and earth—the exact translation of Genesis in Hebrew is not at odds with evolutionary theory.

The difference between the two texts was the result of a power shift in ancient Hebrew society. The Hebrew priests of the storm god Yahveh (*Jehovah*) became the dominant group around the sixth century B.C. and suppressed the worship of all other gods, including those that were female. Hebrew society at this point was polytheistic. With this translation, it became monotheistic and male-centered. God possessed only one gender. The texts of the time were rewritten into the *Book of Law* in the reign of Josiah in 621 B.C. (Eiselen, Lewis, & Downey, 1957, p. 92). The texts were changed to shift “gods” to “God” to show that the Hebrews were monotheists all along. In southern Israel, God was named *Jehovah*. In northern Israel, texts show God to be called *Elohim* (Eiselen et al., p. 218).

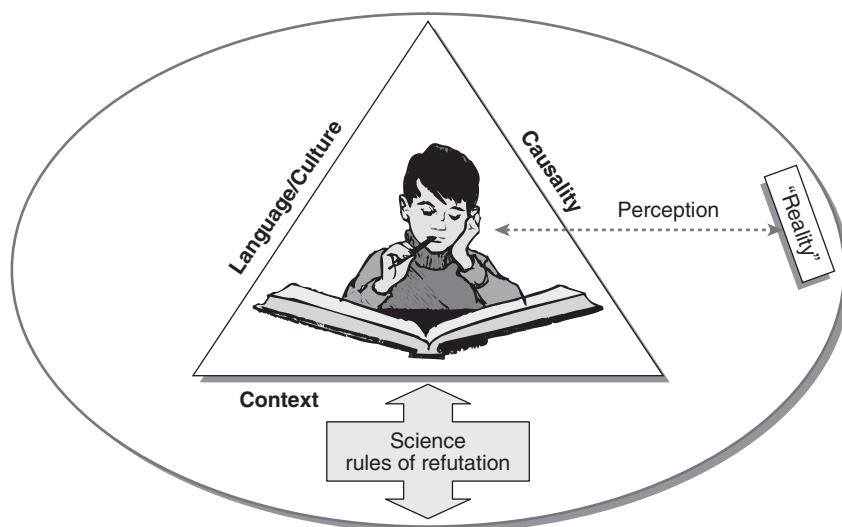
The Hebrew language is a difficult one to translate. It has 22 letters, all consonants, and “some of these can scarcely be represented by our English letters, or spoken by our vocal organs” (Eiselen et al., 1957, p. 100). Furthermore, Hebrew uses few particles and compounds and eschews independent pronouns and tenses. Acts are either completed or not completed, without any reference to time: “It is not easy for the modern interpreter to put himself in the place of the ancient writer” (Eiselen et al., p. 99).

Perception and Truth Are Theory Embedded

What any perceiver believes is true is usually linked to larger stories or narratives, either explicitly or implicitly. In some cases, these can be called “theories,” where they are offered as statements open to refutation (see Popper, 1965). Where such statements are offered as tenets (matters of true belief), the only avenue open is to accept or not accept their authenticity. These “stories” are not open to refutation. Most stories embedded in mythos (religion) are not open to refutation. In fact, disbelievers are called heretics or infidels. Stories not open to question may be called dogma. Figure 3.2 shows this difference. Human perception, even in science, occurs within sociocultural rules that remain linguistically dependent. Science is not value-free. Statements judged within the rules of science may be false because as Feyerabend (1991) indicates, “theories very often contain hidden assumptions one is not even aware of” (p. 20).

The practice of medicine is full of stories about wrong theories or stories within larger theories. These are “stories within stories” (Cherryholmes, 1988, p. 156). In some cases, the larger theory may be wrong and discourage a correct practice from being applied. For example, during the American Civil War, doctors understood that infection could eventually kill a soldier. They believed that infection was caused by foul air

❖ Figure 3.2 The Rules of Refutation in Science



or to some unseen contagion. The concept of asepsis or sterilization to prevent bacterial infection was unknown (because bacteria were unknown). Some observed medical conditions were simply misread. A preliminary infection in which pus was produced near a wound was labeled “laudable pus” and was believed to be a sign that the patient was recovering (Duffy, 1979, p. 222).

When gangrene was discovered among 50 soldiers after the battle of Antietam in 1862 (the bloodiest battle in American military history—Sears, 1983), doctors were ordered to wash their hands after treating such cases. Many were outraged at this command. Although no new cases of gangrene were reported after extensive hand washing, no orders were given extending the procedure to other types of wounds or patients (Tschanz, 1992, p. 37). Thus, in this historical story of medical practice, a true statement (hand washing) was not understood because it was embedded in a larger narrative that was false (infection being caused by foul air). Medical doctors of the day were incapable of comprehending the nature of infection because they believed it to be the product of the sum of symptoms and did not understand the cause (Peirce, 1955, p. 51). The continued misreading of infection caused the death of one U.S. president. In 1881, when President James A. Garfield was shot in the third rib by an assassin, his doctors probed the bullet wound with their fingers (insuring infection), and noted “laudable pus” developing 3 days after the incident. As the infection developed into abdominal peritonitis, they were still not worried. President Garfield died 11 weeks later from infection (Duffy, 1979, p. 249).

Human perception is not only filtered by existing narratives (stories), but defined but them. We do not “see” things we do not believe are there although they may be there all the time. For example, it was once widely believed that peptic ulcers were caused by excess nervousness, personality disorders, or chronic anxiety (LeFanu, 1999,

p. 151). These disorders caused excess stomach acid to be secreted, which in turn led to peptic ulcers. The Freudians even got involved by theorizing that persons with peptic ulcers possessed a secret desire to remain dependent on their parents. Domineering mothers and meek fathers were hypothesized to be the causative agents. Experiments with monkeys that were placed in decision-making contexts for other monkeys and given electric shocks showed that the animals developed peptic ulcers. In addition, after the turn of the century, the rate of individuals developing peptic ulcers was 1 in 10 adult men. Explanations were offered that the rise in the complexity and intensity of modern life led to this condition of excessive stress and the result was increasing cases of peptic ulcers.

Then in 1983 in Australia a young medical intern, without training in research, found a small “crescent-configured” bacterium in the lining of the human stomach. This discovery was thought impossible because it was believed that no bacteria could live in the acidic environment of the stomach. That was the reason that the presence of peptic ulcers “had” to be accounted for by something else. But Dr. Barry Marshall, the young intern, discovered that when he gave a patient with a chest infection the antibiotic tetracycline, the patient reported that his stomach symptoms were much improved. Dr. Marshall worked to isolate the stomach germ called helicobacter and when successful devised a treatment plan that completely cured 50 patients of peptic ulcers. Dr. Marshall even infected and cured himself with this treatment. James LeFanu (1999) comments as follows:

There was now no escaping the scale of their [medical practitioners] earlier collective self-deception, for not only had they failed to see these bacteria even though they were present in virtually all their patients, but they had systematically misinterpreted the many clues pointing to the fact that peptic ulcers must be caused by an infectious organism. (p. 155)

Scientists are human and humans do not directly see what is in any particular conceptual “field.” Perception is determined by belief. One “sees” what one expects to see and does not see what is not expected to be “there.” There can be no true “objective” view of reality.

Perception and Truth May Be False

Even if perception is anchored to something that is true (at least for the moment), the extension of the perception may be false. We pause here a moment to consider Darwin’s notion of natural selection-adaptation being used to support and promote a variety of social doctrines, including shady business practices in the name of competition, and even religious ones: “God picks out a select few” (see Ruse, 1979, p. 264). In Feyerabend’s (1991) words, “But ideas (such as true statements), like butterflies, do not merely exist: they develop, they enter into relations with other ideas and they have effects” (p. 163). Nowhere was this more amply illustrated than in the effects of Darwin’s ideas on all aspects of British life, from its political system to its economic base (see Ruse, 1979).

Darwin’s ideas generated a host of fallacious theories in other fields, notably the false “truth” of recapitulation (Gould, 1981, p. 114). The idea embodied in recapitulation was that “ontogeny recapitulates phylogeny,” or that growth of a human retraces the

growth of the species itself (Gould, 1977). Thus, the true observation that, at a certain point in time, a human embryo possessed slits in the head like fish gills provided “evidence” that humans were passing through the “fish stage” in their evolution to the current level of development.

With recapitulation, all animals could be ranked on the same scale. Humans could be ordered into groups that were “higher” or “lower.” The American paleontologist E. D. Cope was a recapitulationist. He theorized that humans could be sorted into four lower classes beneath Nordic white men: nonwhite races, all women, southern European men, and lower classes within superior races such as the Irish (Gould, 1981, p. 115). The classification of the human family by race on a scale of development was endorsed by the founder of anthropology, J. F. Blumenbach, who devised a scheme of sorting the races into groups on the basis of intelligence and perceived degree of “civilization” (Gould, 1981, p. 32). Cornell West (1999) was therefore correct when he declared that the origins of contemporary racism lie within science (pp. 55–86).

Blumenbach’s racism entered American schoolbooks, among them an 1881 geography text, *Appleton’s Standard Higher Geography*, which displayed the five racial categories, noting that the white was “the most intellectual and civilized race, and embraces the leading nations of the earth” (p. 14). [As “proof” of the premise, three human skulls are shown with the most “developed” being the white, followed by the Monogolian and then the Ethiopian. The use of skulls to demonstrate intellectual capacity emanates from a now defunct school of thought called *craniometry*, based on Darwin’s theory of evolution, and within it, the related concept of recapitulation, which was supposed to be one of the undergirding “truths” supporting it.

Paul Broca (1824–1880) was professor of clinical surgery on the faculty of medicine in Paris. Through meticulous calculation of the size of human skulls, Broca would stake out a claim to the “superiority” of white men and the white race. Jay Gould (1981) carefully researched Broca’s experiments in measuring human skulls. He found no statistical difference in one of Broca’s key samples (p. 95), while Broca claimed this same sample “proved” his observations of white race “superiority.” Broca worked from predetermined perspectives (tenets) and filtered his data to support his preordained conclusions, all the while denying he was doing so. His collection of statistical data was voluminous. All of it appeared to confirm his conclusions, yet all of it was bogus in supporting a patently false theory.

In summing up Broca’s mistaken concept, Gould (1981) warns of the following: “Broca was an exemplary scientist; no one has ever surpassed him in meticulous care and accuracy of measurement. By what right . . . can we identify his prejudice and hold that science now operates independently of culture and class?” (p. 74).

Because of Broca’s “research,” American history books such as Ridpath’s (1874) *History of the United States* could open their texts with the following statement: “The western continent was first seen by white men in A.D. 986” (p. 13). This statement ignores the fact that Native Americans were already on the continent and had “seen” it thousands of years earlier. The “ladder” of ranking the races linearly following advances by Darwin remains in the popular American mental mainstream to present times. It is advanced blatantly by white race supremacist organizations and remains firmly lodged in education with concepts of IQ and the “bell curve” (Hernstein &

Murray, 1994; see a rebuttal in Kincheloe & Steinberg, 1997, pp. 3–50). Reformers in the first half of the 20th century couched their educational aims for centralized control to “elevate the inferior race” (Apple, 1991, p. 18). Once established by supposed facts, false narratives (theories) and statements often die hard, and leave vestiges of intellectual debris scattered across many generations that may not perish until the civilization itself dies.

Perception and Truth Produce a Situated “Reality”

Human perception or “world view” is inevitably grounded in a specific time, linguistic/cultural and contextual frame. Humans cannot perceive outside of their own humanity and its linguistic/cultural traditions, although humans may become conscious of their presence. Notions of causality are especially grounded in larger metanarratives, either scientific or cultural mythos (religions). Scientific narratives are constantly changing, and a look at historical narratives reveals the changing nature of religious perspectives as well. For example, Biblical scholars studying the Gospels have indicated that 82% of the words allegedly spoken by Jesus were not actually his.

Not even the fundamentalists on the far right can produce a credible Jesus out of the allegedly inerrant canonical gospels. Their reading of who Jesus was rests on the shifting sands of their own theological constructions. (Funk, Hoover, & the Jesus Seminar, 1993, p. 5)

Human perception always produces a world view of potential “realities” that are situated. This means that human world views are locatable and can be “fixed” within spans of history that are bound by culture and language. In the sense of a “world view,” the most important histories are conceptual/metaphorical. This is critically the case with human moral development.

What is true must be regarded as a statement or proposition, often to refutation, that no one has yet been able to show is false. No statement can be forever “true” in this sense. It is merely accepted as a temporary truce in the never-ending struggle to find a test that will eventually show that the statement is false.

The idea of subjecting statements to continual attempts at refutation has been called by Karl Popper (1979) “the critical method” (p. 16) or the doctrine of falsification (Popper, 1965, p. 229). Popper concedes that in a case in which an infinite number of theories are possible, no method can deduce which theory is true. The perceiver is then faced with a situation in which any number of narratives or theories may be true or false. In this situation, there can be no permanent mystical entity called “objective reality” that will finally be “discovered” by a scientist or anyone else. It should be clear that human perception is invented. Reality is a *syncheism*, that is, a situation in which no person or group can ever exhaust the possibilities of determination, or as Peirce (1934) concludes, “Reality is a continuum which swims in indeterminacy” (p. 171).

It is due to this indeterminacy that Newton’s theories still work. They still predict the tides. They don’t explain some of the phenomena that Einstein’s theories do, yet Newton’s theories are not false. They are simply not as “true” as Einstein’s. In time, Einstein’s theories may be similarly pushed aside.

It is often difficult for scientists to differentiate between theories and to assess their overall truth content. In fact, theories or paradigms are never in themselves testable. They simply contain too many possibilities to test, and for some statements, there is no way to test them directly. It was because of this dilemma that Karl Popper (1968) commented, "I do not demand that every scientific statement must have in fact been tested before it is accepted. I only demand that every such statement must be capable of being tested" (p. 48). Devising appropriately rigorous tests of statements derived from a theory may be exceptionally difficult.

A recent example of a well-accepted theory that is not able to account for all the phenomena under its aegis is the case of the pink lady's slipper orchid that grows wild in Virginia's great Shenandoah Valley. Zoology professor Douglas Gill, an evolutionary biologist at the University of Maryland, has been systematically gathering data about this plant that has baffled traditional Darwinists (McDonald, 1991, p. A6).

Darwin's premise—that organisms survive and reproduce in proportion to their adaptability to their environments—does not explain how the pink lady's slipper orchid manages to survive in the Shenandoah Valley. Professor Gill found that none of the 1,200 orchids he studied in a 1-acre plot had been pollinated. Over 14 years of observation, Dr. Gill found that of 3,300 plants, only 1,000 flowered and only 23 had been pollinated. The mystery was how this plant reproduces itself to survive in its environment. Its incapacity to do so would reject Darwin's natural selection thesis.

At first, Professor Gill thought that the flowers were in some way not attracting bees for pollination purposes. This proved correct. How then does the orchid attain pollination? Many orchids self-pollinate. The type of pink lady's slipper orchid studied by Gill is not one of them. He says, "There is no way I can show in this orchid a significant pattern of natural selection for certain flower morphologies" (McDonald, 1991, p. A8).

Gill and most of his biology colleagues still accept the main premise in Darwin's seminal 1859 work, *On the Origin of Species by Natural Selection*. Even Darwin himself, who wrote a book about orchids in 1862, was stumped by some orchids that defied his own theory. The inability of a theory to account for every possible variable does not necessarily invalidate it or lead to its abandonment. "Every scientific theory, interpreted in a literal way, is in conflict with numerous facts," says Paul Feyerabend (1991). The following occurs as a result:

You will no longer think of a theory as a well defined entity that says exactly what difficulties will make it disappear; you will think of it as a vague promise whose meaning is constantly being changed and refined by the difficulties one decides to accept. (Feyerabend, 1991, p. 72)

It seems clear that theories as a special kind of metanarrative involved in the work of science must be dissembled into propositions to be tested. The dissembling takes the form of "deducing from them statements of a lesser level of universality. These statements in their turn, since they are to be intersubjectively testable, must be testable in like manner—and so ad infinitum" (Popper, 1968, p. 47).

At the same time, the manner in which various tests are devised to assess whether statements or propositions are true is at least partly determined by theories about truth and its nature. It is to this matter that we now turn.

How Do We Know What We Perceive Is True? Theories of Truth

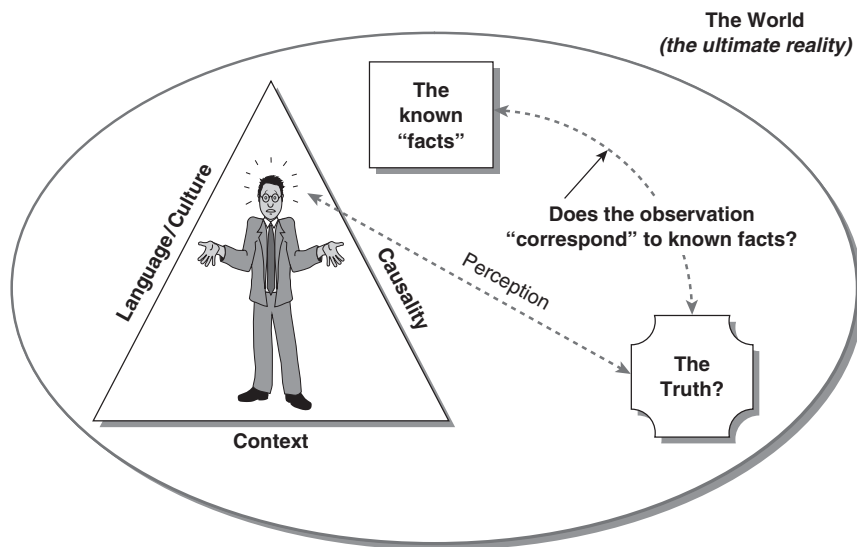
As opposed to verification of tenets by affirmation or disbelief similarly, science proceeds by raising questions concerning the nature of human perception itself. How would humans know if their perceptions about something were “true”? An affirmation with roots in faith is its own confirmation. One simply has to believe intensely enough and doubt can be overcome.

Science, on the other hand, inquires about its own ability to know. One of the first quandaries regarding theories of truth lies in determining by what means one knows if one’s representation of truth or “reality” is in fact the truth and the reality. The situation of the perceiver is shown in Figure 3.3.

In the instance shown in Figure 3.3, a person engages in the act of perception. A relationship or a proposition is formulated. The perceiver formulates a hypothesis about what is true. The first way a perceiver might know if his or her perception or observation was true was to compare it to already known “facts” that were similar and generally accepted as true. If the observation “corresponds” to that which is already known, then the observer could conclude that his or her proposition was also true. This “theory of truth” has a long history in science. It is called the *correspondence theory* of truth.

Correspondence theory consists of designing procedures for verification. Such data are normally sensory or experiential information. The idea behind science utilizing the correspondence theory is that of empiricism. Empiricism holds that there is no knowledge possible (or worthwhile) outside of the human senses. Empiricism denies that there is any such thing as inborn, innate, or a priori knowledge that is unable to

❖ Figure 3.3 The Correspondence Theory of Truth



be ultimately demonstrated (usually seen/observed). It rejects the notion “that there are universal or necessary truths” (Runes, 1984, p. 105).

House (1991) has delineated the traditional and largely positivistic tenets involved in defining educational research linked to the correspondence theory of truth as the following (paraphrase):

1. All scientific propositions are founded on data and facts in which hypotheses are verified against the facts.
2. Scientific theories are those using hypothetical-deductive methods which assume their meaning via linkages to observations and definitions stated in performance terms.
3. The activity of research is itself atheoretical; the most important aspect of a theory is its ability to predict events, occurrences, or results.
4. Causality is that which links events with contingencies.
5. Explanation and prediction are considered parallel forms. (pp. 2–3)

The correspondence theory has a number of problems, chiefly the ambiguous nature of the “facts.” Securing agreement about the “facts” is often a matter of perspective and is not theory-free but encapsulated in a theory itself, or in the words of Evers and Lakomski (1991), “our knowledge of how we know the class of epistemically privileged items is not itself epistemically privileged” (p. 228).

Any theory of truth that is language dependent has a number of built-in problems at the outset. We shall comment on this problem shortly. Finally, the unreliability and subjectivity of human experience in “verifying” truth is also a problem.

Karl Popper (1968) comments on the instability of the scientific enterprise in words that ought to create skepticism that what is “scientific” is permanent and lasting:

Science does not rest upon solid bedrock. The bold structure of its theories rises, as it were, above a swamp. It is like a building erected on piles . . . and if we stop driving the piles deeper, it is not because we have reached firm ground . . . we are satisfied that the piles are firm enough to carry the structure. (p. 111)

There are no granite substructures on which to build science, and experience is a mercurial substructure at best.

Linguistic Difficulties With Theories of Truth

The simple discernment of truth is not as “simple” as it seems. Those who insist that it is simple usually have an agenda that cannot stand sustained scrutiny. Simple approaches require only simple solutions. The question of what is truth has been taken up by scores of philosophers over the ages. The answer is—it all depends. Aristotle defined truth in the following way:

To say of what is that it is not, or of what is not that it is, is false, while to say of what is that it is, or of what is not that it is not, is true. (from Haack, 1988, p. 88)

In attempting this definition, Aristotle was caught in a definite language quandary: “To say of what is [to speak about something] that it is not [that is not true] or of what

is not [to say something that is not true] that it is [but which is true] is false [is not true], while to say of what is that it is [to speak about something which is true, and it is true, and therefore true] or what is not that is not [or is false and therefore false] is true [is really false and therefore true].” This explanation is reminiscent of the very famous language problem called *the liar’s paradox*, a version of which is also called Epimenides paradox (Haack, 1988, p. 136).

The liar’s paradox occurs if one person should say to another, “Everything I tell you is a lie.” If, however, this is true, then the person has not lied to you. On the other hand, if the person tells the truth, he has lied to you, but he has told you the truth. Aristotle’s definition contradicts the liar’s paradox, yet by saying, “truth is what is true and therefore not false,” he has not explained very much.

The transparency of language, and the inability to explore reality through it, was discussed by Ludwig Wittgenstein (1889–1951) in *Tractatus Logico-Philosophicus* (1961). In this work, Wittgenstein declared, “What finds its reflection in language, language cannot represent. What expresses itself in language, we cannot express by means of language” (p. 26).

“Semantic theories” of truth are the descendents of Aristotle’s version of the nature of truth. Semantic theories have to take into account two major problems in discerning what is true from what is not. The first problem is that natural languages (English, French, German, Spanish, Italian, Chinese, Arabic, etc.) are semantically closed, that is, even with correct use one can fall into the trap of antinomy.

Antinomy is the condition in which two correct inferences can be equally and validly drawn from the same passage, resulting in contradictions such as the liar’s paradox. Alfred Tarski (1956) indicates that “natural languages contain their own meta-languages, so that truth cannot be defined without running into paradox” (from Haack, 1988, p. 120).

The second problem facing those using natural languages in their search for truth or “reality” is that words must follow formal patterns of logic. This requirement is a formidable one for most natural languages, which are idiomatic and not logical. Logical truth must be independent of the world and not be bound by experience. It is the gap between logic and experience that creates the grounds for paradox (meaning one statement can stand for two contradictory interpretations). Logicians are interested in the world as it should be and not the way the world is. The result is modal logic (see Palmer, 1986, p. 192).

The difference between modal logic and experience produces two kinds of truth. The first kind is analytical. The second is synthetic. Analytical truth is dependent on logic and not on experience. The example provided by Palmer (1986) of an analytical truth is “All bachelors are unmarried” (p. 204). This statement would be true on Mars, the moon, or Earth. It is not dependent on experience.

Synthetic truth is world dependent. It would be represented by the statement “All bachelors are happy” (Palmer, p. 204). To support this statement one would have to gather a lot of world-related data (empirical) to ensure its accuracy. Theories of semantic truth end up using disambiguated language, which is logical but often difficult to follow because the meaning is not experience dependent.

Willard Van Orman Quine (1980) has disputed the whole idea that there is any such thing as analytical or synthetic truth. Quine posits that the phrase “No bachelor is married” is nothing like a truth statement grounded in some ulterior factual or

logical world. To use language as Tarski (1956) employs it simply is the result of “language synonymy,” that is, replacing synonyms for synonyms (pp. 20–23). This kind of language game is rooted in common observations within the same language. Finally, “the old champions of a verification theory of meaning went wrong in speaking too blithely of the meaning of individual sentences. Most sentences do not admit separately of observational evidence. “Sentences interlock” (Quine, 1974, p. 38). The interlocking of sentences means that when considering what is true based on some sort of observation, the researcher has to decide which sentences are false and which ones should be considered to remain as true. Quine (1980) insists that “the unit of empirical significance is the whole of science,” and not individual sentences, one by one. To this matter he adds, “it is nonsense . . . to speak of a linguistic component and a factual component in the truth of any individual statement”: (Quine, 1980, p. 42).

Critics of the semantic theory of truth also attack it as another form of correspondence theory. If one insists that what is true is simply what is perceived as true, then the truth is actually what corresponds to what is perceived as true. Other critics aver that the use of semantic theory as presented by Tarski (1956) is an example of “physicalism,” that is, a movement to reduce all phenomena to that of concrete, physical objects and their relations. Such a scheme is utterly useless in describing a non-physical object like “leadership.”

The semantic theory of truth is as contextually bound as the correspondence theory that it attempted to supplant. Languages are contextually sensitive and even Tarski (1956) noted that what was true in one language may be false or inconsequential in another. The only “truth” that exists may be in the metalanguage. Truth is therefore relative (Haack, 1988, p. 114).

Pragmatist Theories of Truth

The pragmatist theory of truth was enunciated by Charles Sanders Peirce (1955) as “a method of ascertaining the meanings of hard words and of abstract concepts” (p. 271). The term *pragmatism* comes from the Greek word meaning *action*, from which the English words *practice* and *practical* are derived. The “pragmatic method” is an approach to truth that determines it by defining “what conduct it is fitted to produce: that conduct is for us its sole significance” (James, 1991, p. 23). Having defined pragmatism, James then indicates that “theories thus become instruments, not answers to enigmas” (p. 26).

The great American pragmatists of science were John Dewey, Charles Sanders Peirce, and William James. Pragmatism is a form of correspondence theory, but it is a form of the idea that insists the meaning of a concept is that it ultimately makes a difference in the real world. If there is no difference, then there is no meaning. This idea was Peirce’s concept of the “theory of inquiry,” which formulated a scientific method that was superior over others such as authority or a priori beliefs. Such a method ultimately led to “stable beliefs, beliefs which will not be thrown into doubt” (Haack, 1988, p. 97).

The notion of correspondence in the pragmatic theory of truth is that the scientific method will be constrained by reality, and therefore what it produces will correspond to that reality. The definition of truth is very much part of the method of discerning it. It was regarding this problem that Karl Popper (1965) commented that

the search for theories that were simply powerful instruments (methodologies) may be quite well supported by false theories as well as true ones (p. 226). None of the pragmatists believed in absolute truth. Dewey described truth as “warranted assertibility,” (1938, p. 345) and, like Peirce, believed it to be stable, that is, safe from doubt. Peirce (1955) proffered that knowledge was never absolute and existed in a state of uncertainty and indeterminacy, in fact, “all things so swim in continua” (p. 356).

Coherence Theories of Truth

A coherentist perspective on truth takes a position on two views: (a) the truthfulness of a statement or theory can be judged only in a context of other statements (a kind of contextual set), and (b) trying to return to an experiential base of verification to discern the matter of truthfulness will be neither productive nor definitive. The criteria for determining a superior theory are those that Evers and Lakomski (1991) indicate are “extra-empirical” (p. 37). A superior theory is one that is more consistent, comprehensive, simple, conservative, and fecund, and possesses greater explanatory unity than others. This is an adaptation of correspondence. A superior theory is one that adheres or “corresponds” to these requirements better than others. It is assumed in turn that superior theories are world descriptive as well, and can be verified empirically (adhere to the facts).

The problem with coherency theories is, according to Karl Popper (1979), that they confuse consistency with truth, that is, a statement is considered true if it corresponds to other statements we have accepted as true. This procedure is a very conservative one; “entrenched knowledge can hardly be overthrown” (Popper, p. 309).

Lakatos (1999) called “coherency” a form of “simplicism” because at its base the position assumed that when confronted with two theories or explanations, one had to assume that they were roughly equivalent. If equivalent, then one could determine which one was “simpler.” Lakatos then commented, “Simplicity seems to be relative to one’s subjective taste” (p. 174). Despite Lakatos’s admonitions, coherence retains a powerful appeal to some leading thinkers in educational leadership such as Lakomski (2005).

Redundancy Theories of Truth

Frank Ramsey (1931) took the position that the distinctions between object language and metalanguage were unnecessary, that is, they were redundant. Alfred Tarski (1956) made such distinctions to avoid the problem of paradox.

Ramsey discerned that he could eliminate the words “true,” or “false,” from nearly all expressions. For example, the expression “It is true that p” can be written as “means the same as p” or “For all p, then p” (Haack, 1988, pp. 127–128). Ramsey therefore proposes a more simplified approach to language expression regarding truth or falsity. In his process, he is able to bypass the problem of “objects of relief.” For example, the statement “It is true that p . . . is true” includes the idea that it is a predicate (the part of a sentence or clause that expresses what is said of the subject). It is an object of belief that truth is a property of something. However, by eliminating the word *truth*, it is no longer necessary to know what it is a proper of, so the belief is redundant (Haack, p. 128). The solution to such semantic riddles and problems—even applying the logic of the redundancy theory to language—has not eliminated the problem of paradox so far, which Tarski’s (1956) theory was developed to do.

The Uses of Truth in Science

There are few absolutes in science. Karl Popper (1965) has indicated that there are two points of view about the use of truth in scientific activities. The first use of truth is to prove things, that is, that facts or propositions can be believed if they can be verified. In the process of verification they become worthy to be believed. Belief (Dewey's warranted assertibility) is the absence of doubt. To arrive at this state, one must produce positive evidence. Logical positivism or scientific empiricism lies behind this view of how truth is established. Popper's (1965) view is that such concepts have been discredited because positive reasons can never support the belief in a theory, whether buttressed by observation or probabilities in statistical manipulations (p. 228).

A second view is proffered by the falsificationists. This perspective is that theories are never held to be true from empirical evidence. Rather, they are held in a state called *verisimilitude*, after rigorous testing has failed to dislodge them for the moment. Falsificationists, to which Popper belonged, are concerned only with testing theories in proposition form, and in continuing to test them ad infinitum. All theories are most likely to be shown false in time. So truth is that which has not been shown to be false (so far); "We are not interested in establishing scientific theories as secure, or certain or probable," says Popper (1965, p. 229).

BIOGRAPHY BOX 3.1

Barbara McClintock (1902–1992)

Iconoclastic Thinker, Nobel Prize Winner, Passionate Pursuer of Truths

The famous "corn lady" of science, Barbara McClintock, not only epitomized a passion for pursuing mysteries that intrigued her, but learned how to endure in a world that demeaned her work and erected barriers to her career and her personhood because she was a woman.

The youngest of three daughters, Barbara recalled that her mother expressed disappointment because she was not a boy. Barbara recalled that she felt she didn't really belong in the family because she was the odd member (McGrayne, 1993, p. 147). Throughout her life, Barbara's mother worked to persuade her daughter to give up the academic life and her work in science. Her father raised her as a boy, however, so she was free to pursue whatever activities she found compelling. "I didn't play with girls because they didn't play the way I did," Barbara recalled (McGrayne, p. 148). When she graduated from high school, Barbara wanted to go to Cornell, but her mother blocked the idea, fearing a higher education for her daughter would make her unattractive for marriage. Securing the approval of her MD father, Barbara went to Cornell and enrolled in the College of Agriculture there because tuition was free.

Slim at 90 pounds and 5 feet tall, Barbara wore her hair bobbed, sported knickers, and smoked. Already a free spirit, she rejected sorority bids because some of her Jewish friends were not invited to join them. Cornell researchers specialized in a study of corn not only because of its importance as a crop, but because the way it grew permitted controlled studies of genetic changes rather quickly. Barbara McClintock forged to the front in corn research, working with corn chromosomes. Only one male colleague recognized the significance of her work. "Hell, it was so damn obvious. She was something special," he remarked. At 25, Barbara earned her PhD at Cornell and set forth to work in the academic world. At this point she rejected the idea of becoming a wife to her beau of the time, commenting, "Men weren't strong enough. I knew they would want to lean against you . . . They're not decisive" (McGrayne, 1993, p. 154).

But the new "Dr." McClintock found the going tough. While she earned a "post doc" at Cal Tech in 1931, the first woman to do so at the famous institution of science, she was allowed only once into the university's faculty club.

Later, as an assistant professor at the University of Missouri, McClintock had a crusty reputation with students. She expected them to work as hard as she did. She regularly had students in the lab past university curfew hours, and she wore pants all the time. She was excluded from faculty meetings and was told that once her chair quit she would most likely be fired. She left Missouri and never went back to a university again.

Finally, in search of a place to continue her research, she found a location at Cold Spring Harbor on Long Island, New York, where geneticists around the world studied in the summer. Securing a very modest stipend, Barbara moved in. It was here that she was relieved of her teaching responsibilities and had complete intellectual freedom to pursue any line of inquiry that made sense to her. Living in a nonheated room over a garage, Barbara McClintock began her corn gene research program that eventually led to the Nobel Prize in genetics. For her work at Cold Spring Harbor, she was elected the first woman president of the Genetics Society of America in 1944.

But her research was so complicated and filled with data and empirical evidence that it was often difficult for her male colleagues to follow. Once in 1951 after she gave a symposium in which her conceptual frame of genetics revolved around the fact that genetic systems were moving and exceptionally complex rather than stable and simple, a biologist remarked, "I don't want to hear a thing about what you're doing. It may be interesting, but I understand it's kind of mad." Another leading scientist ridiculed her as "just an old bag who'd been hanging around Cold Spring Harbor for years" (McGrayne, 1993, p. 168). Later, when she summarized her research in a very lengthy scholarly piece published in 1953, only three individuals requested copies of her work. She concluded that publishing was a waste of time and she ceased giving seminars.

Barbara McClintock is a near perfect example of a thinker who challenged prevailing thought orthodoxies. Accustomed to being ostracized because of her sex, she forged on with her research and the pursuit of anything that interested her,

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(Continued)

from studying certain kinds of toads to studying extrasensory perception (McGrayne, 1993, p. 169). Her environment on Long Island provided her with the intellectual/conceptual freedom to let her thoughts go in any direction. In her 80s she was still putting in 12-hour days and traveling to South America for her corn research. Her discovery of genetic transposition in corn turned the idea of genetic chromosomes existing as immovable elements to current images of genes as dynamic and exceptionally fluid systems that could be re-ignited even if they were believed to have expired in some environments.

Barbara McClintock was the seventh woman in history to win a Nobel Prize. Her research was considered one of the two greatest discoveries in genetics for her times; the other was the exploration of the structure of DNA (see Watson, 1996). A female colleague recalled that Barbara McClintock was a tiger to survive in the scientific world dominated by men because women had to have those characteristics “to abide in a world where they weren’t wanted . . . You’re not going to find any weeping willow making it” (McGrayne, 1993, p. 162).

One might think that Barbara McClintock’s story was atypical for science, which professes to be neutral on so many counts. Female scientists working at universities today still encounter significant obstacles based on their gender and social stereotypes of “women’s work.” Laurie McNeil, a physicist at the University of North Carolina, says that continued discriminatory barriers mean “You’re neglecting half your talent pool, and science is not going to be the better for it” (Heady, 2003, p. 9).

Popper’s perspective puts a different emphasis on theories of truth. If one is interested in “proving” something to be true, the various theories of truth are disconcerting. They show that there are few ways to conclusively do so. All of them are flawed to some extent, either logically, or in leading one into a morass of semantic traps and paradoxes that are difficult to resolve; some of the resolutions produce such minutia as to appear trivial in the real world.

On the other hand, if one is not trying to “prove” something, but is interested in testing it, the various theories of truth are illuminating. They suggest various ways to probe for weaknesses in arguments, lines of logical development, and inadequacies in presenting evidence or “correspondence.” If one is not searching for certainty or even stability, but is in pursuit of a temporary state (verisimilitude), then the various theories of truth are quite useful in demonstrating what problems remain in that pursuit, what fallacies to avoid, and what remaining avenues are still open.

As researchers work with theories, they may produce evidence that does not “correspond” to predictions made by the theory. Contrary evidence never outright invalidates a theory. Rather, as Quine (1986) has shown, there is not a one-to-one relationship between data and propositions. Theories are comprised of bundles of hypotheses. Rarely are data able to identify which one may be false. Theories are usually underdetermined by data, “and not only by the observations we actually have made and will make, but even by all the unobserved events that are of an observable kind . . . our theory . . . is underdetermined by all ‘possible’ observations” (Quine, 1986, p. 6). So, even

if some data do not correspond exactly to a theory, researchers will continue to use the theory until more and more of it is invalidated. This prospect is called the *Duhem-Quine thesis* (Phillips, 1987, p. 13).

Sometimes discarded theories come back to life. The process may take centuries. For example, Paul Feyerabend (1991) indicates that the theory of the motion of the earth existed in antiquity. It was criticized by Aristotle (384–322 B.C.) and was in disrepute until Copernicus revived it. A similar story can be told about atomic theory. Originally the creation of Leucippus in the 5th century B.C., it was refuted by Aristotle (342–322 B.C.) and was rejected in the 19th century. “It is good not to be guided by experience and experiment alone,” comments Feyerabend (p. 8). Despite its obvious shortcomings, correspondence, in its variety of forms, continues to be one of the major ways of deciding whether a theory is worth pursuing.

Pursuing “Truth” in Educational Leadership

Early workers in the field of educational leadership were influenced by classical Greek philosophy, notably Plato’s concept of the *ideal world*, which was fixed and impermanent. Culbertson (1988) notes that two of the discipline’s earliest thinkers—William Torrey Harris and William Harold Payne—were devoted to making education a “new science . . . for a new management” (p. 4). They were trying to engage in a quest for science that would envision schools as organizations that reflected a multidisciplinary perspective such as history, political science, sociology, and law. While Payne and Harris searched for a compatible “new science,” they soon found that one was emerging and were swept aside in the move toward logical positivism, as expressed in the ideas of August Comte and Herbert Spencer. The ideas of Comte and Spencer were cresting in the late 19th century. Spencer wrote the following in 1860:

Science is organized knowledge; and before knowledge can be organized, some of it must first be possessed. Every study, therefore, should have a purely experimental introduction; and only after an ample fund of observations has been accumulated, should reasoning begin. (p. 119)

The idea that science and the scientific method were quite superior to anything to be included in a school was captured by Spencer in this paragraph:

By science, constant appeal is made to individual reason. Its truths are not accepted upon authority alone, but all are at liberty to test them—nay in many cases, the pupil is required to think out his own conclusions. Every step in a scientific investigation is submitted to his judgment. He is not asked to admit it without seeing it to be true. (p. 79)

Spencer’s admonition about science bespeaks his view of it. Truth is established objectively by “seeing” it. This is verification by observation—the experimentalist position. Truth is established inductively, not by accepting a teacher’s view or some deductive principle, but rather by “testing” for it. Here, we have the correspondence theory in abundance.

As schools of education began growing (see Clifford & Guthrie, 1988, pp. 47–84), they added departments of educational administration that initiated the practice of surveying school systems to establish “the facts” (see Tyack, 1974, pp. 182–198).

Data gathered from these procedures were supposed to be “representative” of the “real world.” It was from such information that scholars could create scientific laws and could establish a true management science for schools (see Tatsuoka & Silver, 1988, pp. 677–701).

Culbertson (1988) notes that between 1901 and 1925, educational administration was dominated by the desire of academics to find legitimacy in their new places in American higher education. The tool to accomplish this purpose was seen as gathering the data empirically. In the mid-1930s, a second generation of educational administration professors began looking to the social sciences as models of inquiry. The role of the school survey was soon envisioned as too narrow, so experimental techniques were proposed as the appropriate tools to determine the truth.

Among the national leaders were Paul Mort, Arthur Moehlman, and Jesse Sears (Culbertson, 1988, pp. 12–13). It was Sears (1950) who advanced the thesis that schools should be seen as organizations that are parallel to government and business. Sears’s ideas led the way to the present dominance of organizational theory as the contemporary theoretical umbrella for the study of educational leadership. We see this continuing dominance of theoretical thought in the works of Peter Senge (1990) and Bolman and Deal’s (1991) *Reframing Organizations*, which are simply the latest of the continuing ripples of the 1957 “theory movement” in educational administration (Culbertson, 1995, p. 41).

Figure 3.4 shows the impact of the “theory movement” in the ideas concerning educational leadership that remain regnant. Methods of inquiry and truth seeking are intimately related to this historical moment (Heck & Hallinger, 1999, pp. 141–162).

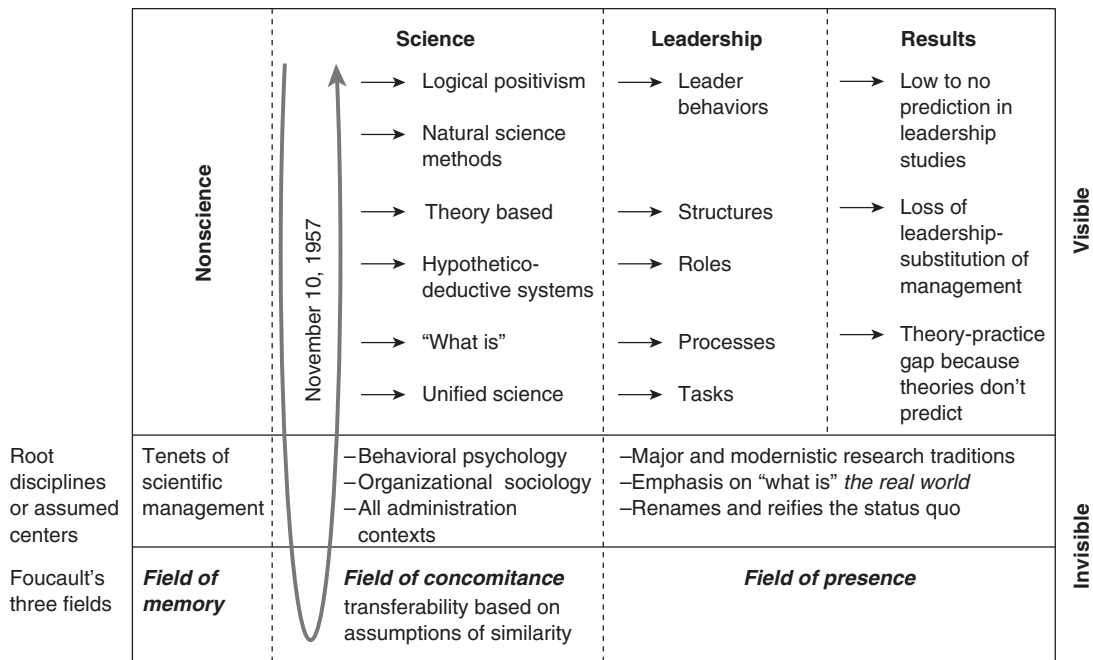
The “theory movement” in educational leadership was an offshoot of the “unity of science movement” powerfully advanced by a group of philosophers and thinkers associated with the Vienna Circle (Mises, 1956; Runes, 1984, p. 302). This group blends the theories of many philosophers, among them Hume, Mill, Helmholtz, Duhem, Frege, Whitehead, Russell, and Einstein (Runes, p. 302). The notion of the “unity of science” was indebted to linguistics and to the world of Ferdinand de Saussure (Gadet, 1986).

The Vienna Circle was a bastion of scientific empiricism and empirical structuralism, a perspective that only by viewing a whole could any part make sense or “mean” anything. One of the leading members was Herbert Feigl, whose ideas were incorporated into the birth of the “theory movement” in educational administration in the time period 1960 to 1980 (Evers & Lakomski, 1991, p. 3). As many of the Vienna Circle thinkers sought asylum in the United States from the rising Nazi movement in Germany, the impact on leading U.S. academics was accelerated and profound. The areas of psychology and sociology were deeply influenced by scientific empiricism. Because these are root disciplines to educational administration, it was not long before professors of educational administration such as Jacob Getzels, Dan Griffiths, Andrew Halpin, and Egon Guba were propelling the field toward a new direction (see Lipham, 1988, pp. 171–184).

This new direction for educational administration was centered in the following key ideas:

- Observation must take precedence in scientific inquiry over intuition or imagination.
- Methods of inquiry in the natural sciences should become the model to use in investigations in the world of human affairs.

❖ **Figure 3.4** The Continuing Influence of the 1957 Theory Movement on the Methods of Inquiry Regarding Educational Leadership



SOURCE: From "The Fateful Turn: Understanding the Discursive Practice of Educational Administration," in *The Changing World of School Administration: 2002 NCEA Yearbook* by English, F., 2003, p. 48. Reprinted with permission from Rowman and Littlefield Education.

- Mathematics was considered the most neutral and most robust of disciplines to pursue observation and truth (hence the preference for forms of quantitative inquiry).
- "Theory" meant "hypothetico-deductive" systems which would guide research.
- The goal of the extension of science to educational administration was a "unified field" in which the most important outcome was the application of laws and principles across all fields of administration: public, business, and education (see Culbertson, 1995, pp. 36–41; English, 1994, pp. 204–208; Greenfield & Ribbons, 1993, pp. 137–138; Thompson, 1958, p. 31).

Figure 3.4 shows these continuing influences. The impact of one idea of "right science" for leadership has been to focus organized inquiry on "behaviors" within "organizational structures" and the result has been that the subject of leadership has been subsumed to the tasks of management and the sociology of structures (see Argyris, 1972; Rost, 1991, pp. 14–36). The lasting dominance of behavioral psychology and organizational sociology are also testimony to the continuing virulence of the Vienna Circle and its adherents in educational leadership thinking. Figure 3.4 also shows Foucault's (1972) ideas that in a "field," there are three moments in time to be

considered. The first is a field of presence. In this “field,” statements are determined to be truth and involve exact description. They are examples of “well-founded reasoning” (Foucault, 1972, p. 57). A field of memory, on the other hand, are those ideas, thoughts, and concepts that are believed to be false or unworthy of any further consideration. These represent the “theoretical discard pile” of a discipline. A field of concomitance represents a place where statements are made in similar areas or other fields that are also assumed to be correct and proper. The idea of “transferability” in a field of concomitance made it possible for the works of Herbert Simon (1945) to cross over from public administration to educational administration (English, 1994, pp. 204–208).

Tracing the Influence of Herbert Simon and the Doctrine of Efficiency

Herbert Simon’s (1945) seminal work *Administrative Behavior* was a watershed in the consideration of educational leadership. In retrospect it has been largely negative in fostering a greater understanding of leadership, and it has fueled an immense wake in the later half of the last century with the accountability movement and all its many facets and ramifications (English, 2003b).

Simon blended together the perspectives on human relations and decision making of Mary Parker Follett (1924; see Biography Box 3.2), Roethlisberger and Dickson (1939), and Elton Mayo (1945), and coupled these perspectives with the new emphasis on logical positivistic behavioral theory contained in the social psychology of Talcott Parsons (1951), to attack the old “principles” as “unscientific,” and to offer the new as, again, truly scientific instead of simply as paradoxical proverbs. Yet even Simon’s new theoretical science contained as much doctrine as the old one that he was attacking and debunking.

BIOGRAPHY BOX 3.2

Mary Parker Follett (1868–1933)

Prescient Management Thinker; Precursor of “Distributed Leadership” and the “Learning Organization”

Mary Parker Follett was an idealist who rejected conceptions of the state and of management that subordinated the individual to those of society or to “experts.” Her ideas about administration and organization were far ahead of their times.

Born to a family of modest means, Mary early on exhibited great intellectual strength. Graduating from high school at 15, she received her higher education from the Society for the Collegiate Instruction of Women taught by professors of Harvard. Later she studied in England at Newnham College, Cambridge University (Crawford, 1971, p. 640).

Mary Parker Follett was a tireless social worker and pioneered the idea of using schools as community centers as well as the notion of providing vocational guidance for Boston school students. Her work in this area emanated from her belief that the neighborhood provided the best source for social organization. Miss Follett was not a believer that social justice would be the result of management/labor conflict, and she did not support labor strikes because such activities were oppositional to creative ways the individual and his/her employer could resolve problems.

Described as a large woman, well over 5 feet tall, with brown hair and blue eyes, Mary Parker Follett was highly religious, although she belonged to no church. In 1925 she began lecturing on issues in industrial management, which made her famous. Miss Follett began her thought on management by disagreeing with her contemporaries about authority. Authority was not hierarchical, she thought, but rather it was pluralistic. Responsibility was therefore cumulative and not something parsed out in standardized tasks or delegated. Today her ideas resemble what may be called *distributed leadership* (see Smylie, Conley, & Marks, 2002, pp. 172–173; Spillane & Louis, 2002, pp. 83–104).

Mary Parker Follett viewed management as a social process centered around the notions of evoking, interacting, integrating, and emerging (Massie, 1965, p. 395). Evoking was the leader's duty to draw out the fullest potential of every individual with whom he or she worked. Follett insisted that subordinates should not be trained in followership, but in working with a leader (Massie, 1965, p. 395). Follett saw interacting as a fluid and dynamic process in which individuals and the situation were constantly changing and adjusting. Follett emphasized that individuals were interacting not only with one another (one on one), but with a whole complex of other persons. Relationships were not linear but circular. Her concept of organization sharply differed from that of classical managerial thinkers in this regard. Instead of seeing the usual line/staff and organizational boxes arrayed in hierarchical relationship, Follett saw a continually emerging set of interactions that were a continuous process. In this respect she anticipated what is called today *the learning organization* (Senge, 1990). Mary Parker Follett is an example of a pragmatic discipline "border crosser." Her thought wove together ideas from political science, psychology, public administration, and industrial management. The force of her work is obscured by the fact that she was very far ahead of her time (Massie, 1965, p. 395).

During the latter part of her life, Mary Parker Follett lived with Dame Katharine Furse, an international leader in the Red Cross and director of the Women's Royal Naval Service in World War I (Crawford, 1971, p. 641).

Simon utilized the criterion of efficiency as the most important of all principles in developing an adequate theory of administration (not leadership, which was too subjective a term for him). Despite taking pains to dissociate himself from the work of Frederick Taylor (Simon, 1945, p. 180), he defined efficiency as "the ratio between input and output" (p. 180) and one in which "to be efficient means to take the shortest path, the cheapest means, toward the attainment of the desired goals" (p. 14). Efficiency for Simon involved the metaphor of the balance sheet and conceded that

“the criterion of efficiency is most easily understood in its application to commercial organizations that are largely guided by the profit objective” (pp. 172–173).

In this scenario, what is most efficient is simply the cheapest route because the attainment of goals is simply maximizing profit. In this economic model, the means and the ends match. The less money is spent up front on costs, the more money one has at the end, or as Simon (1945) put it, “In practice, of course, the maximization of income and the minimization of cost must be considered simultaneously—that is, what is really to be maximized is the difference between these two” (p. 173).

Simon’s (1945) theoretical base is derived from this model of efficiency. From it, he defines *rational organizational behavior* on the part of management: “The efficiency of a behavior is the ratio of the results obtainable from that behavior to the maximum of results obtainable from the behaviors which are alternative behavior to the given behavior” (Simon, p. 179).

The implicit value that underscores this identification of efficient behavior is that of scarcity of resources. Administrative behavior is rational if it maximizes results at the lowest cost.

To do this, Simon (1945) casts out the human dimension of his proffered theory of administration. He eliminates personality as a domain outside of science, and ethics along with it. He engages in a false bit of posturing when he declares that a science of business has no ethical content. The statement “Alternative A will lead to maximum profit” is a scientific statement, he asserts. However, he insists that the statement “To maximize profit is good . . . has no place in any science” (Simon, p. 250).

By defining the maximization of profit as the “best” alternative because it maximizes results (profit) with the lowest cost, the outcome is the same, that is, what is good is the greatest profit. In this self-deceptive tautological stratagem, what is ethical (non-science) is subsumed under a rational alternative that is stipulated as factual without the so-called ethical component being present. Simon’s approach has simply suppressed the ethical component instead of eliminating it. The logic becomes “what is cheap will maximize profit.” The greatest profit is the highest goal of a commercial organization. It is therefore the “best” of all possible alternatives. By default, it is the greatest good to be desired by the organization and its management.

The fallout of this kind of logic is best exemplified by a perfectly rational example of administrative decision making in which profit and cost define and inform “rational and scientific decision making” in an organization. It is an example of Simon’s (1945) “economic man”—“one who selects the best alternative from among all those available to him” (p. xxv).

When the Ford Motor Company discovered that its Pinto automobile exploded sometimes when rear-ended by another car, it calculated the expense of correcting the design problem. Using a chart to calculate the cost of burn deaths, it used the figure of \$200,725 per person, established by the National Highway Traffic Safety Administration as the price of a human life. Figuring the likelihood of such accidents and resulting damages in pain and suffering, hospital costs, and absence from work of the victims to be roughly \$49.5 million, and the cost of sheathing the gas tank with a rubber lining to prevent explosions at \$137 million, Ford management refused to change the auto design (see Gabor, 1990, p. 133). According to Simon’s model, this

would be a rational decision by a purely economic man, based on the maximization of profit. It would be devoid of the problem of ethics and therefore totally “scientific.” The idea that such situations are devoid of ethical implications is absurd. The whole concept of scientific rationality without ethical considerations is in itself a fantasy—a doctrine of belief that is irrational.

Simon’s doctrine turns on the tenets of logical positivism and its insistence on objectivity as a condition in which the observer is separated from the observed. This condition is created when a human perceiver of phenomenon is not believed to be essential to the process of observation itself. The premise is unprovable and is therefore a statement of belief. A perceiver is necessary to create a condition of observation as an act. The “objective world” is therefore intimately bound to the eyes of the beholder and his or her politics, culture, language, and conceptual-affective awareness state, that is, consciousness. The presence of consciousness is a prerequisite to engage in perception. The observer cannot be separated from the observed. There is no objective “fact” that stands alone in a field of phenomena without the presence of a sentient human being to bring it into consciousness. Note the following words of cognitive scientist Donald Hoffman (1998):

Vision is not merely a matter of passive perception, it is an intelligent process of active construction. What you see is, invariably, what your visual intelligence constructs (p. xii) . . . without exception, everything you see you construct: color, shading, texture, motion, shape, visual objects, and entire visual scenes. (p. 5)

So the logical positivists were wrong. There is no independent factual reality “out there” independent of our construction of it. Therefore there can be no “independent objectivity,” and there cannot be separate decisions from the values that are embedded in it or the outcomes produced from it. There can be no factual grounds that exist apart from either the aims or the means, or the decision to adopt those that attain the ends, if by factual we mean able to stand alone untainted by ethical or value judgments. Where then is a science of administrative theory that pretends it is possible?

What is at work here is logical positivism’s classic inability to question its own essential premises. While it insists that all things must be observable and factual to be considered scientific, the assertion itself cannot be verified by anything that is observable or factual. It is therefore a statement of belief—a powerful, nonobservable metaphysical assertion and not science at all. Devitt and Sterelny (1987) explain the following:

One cannot theorize about anything, least of all language, without implicit commitment to a view of the world. As a result, attempts to eliminate metaphysics lead not to its elimination but to its mystification; The philosopher has to hide or deny his own metaphysical assumptions. (p. 208)

The turning on words to separate fact from nonfact results in elaborate explanations that result in logical tautologies touted as science. A tautology is a statement that is true by definition. Logical positivism’s approach to discovery results in the enshrinement of tautologies. Hypothetico-deductive systems often lead back to themselves. Rost’s (1991) admonition should be heeded:

Leadership studies as an academic discipline needs to come out of the woodwork of management science in all of its guises . . . and out of such disciplines as social psychology, political science and sociology. (p. 182)

The study of educational leadership requires the creation of a counter ontology. Such a deliberately crafted view of reality would reject objectivism and any concept of truth as finality. To criticize studies in educational leadership without creating a different ontology will be futile. To successfully engage in counter ontology will require the rejection of a concept of truth, beginning with Socrates, and brilliantly extended by Plato to the dawn of the new 21st century. Thinking outside the closed definitions of Greek logic poses a challenge to the field's most creative thinkers (see De Bono, 1992). It is unlikely that there will be any major breakthrough until it occurs.

A Final Commentary About Theories of Truth

Theories of truth ground our ideas about leadership. They are the “mental prisms” that ground our actions. The pursuit of knowledge, and in particular which knowledge may be considered true, is one of the oldest known pursuits of the human species. Since the era of the ancient Greeks, the idea of how to pursue knowledge has been embedded in a process called *logic*.

Scientific activity as we understand it today arose in the 17th century and has taken on a number of traditions and methods over time. One of the legacies of scientific activity is the way in which the people pursuing science go about their business of developed knowledge, and discerning the true from the not-so-true or the false.

Scientific activity is directed by a number of often hidden assumptions, such as the concept of *determinism*, which rules out “free will” and posits that everything is caused by or connected to something else. These chains of causal events, means, and ends are discoverable if one is persistent enough and knows enough.

Most recently, scientific activity is conceded to be *indeterministic*, governed by choice and chance as much as by anything else. Indeterminism cancels out the concept of progress as it has come to be understood in the West, because change is not always for the better, and because what is considered true today may not be considered so tomorrow.

Current concepts about truth are that it is embedded in language, culture, and temporal spatial relations that deny that it may be considered universal (Lakoff & Johnson, 1980, p. 227). Truth is contextually defined and has either no meaning or a diminished meaning outside the context in which it is located.

Verisimilitude is a concept created by Karl Popper (1965) that is substituted for the concept of truth as a stable and enduring concept, fact, or idea. Verisimilitude represents the nearness to the truth rather than truth itself.

There are five major theories of truth: correspondence, semantic, pragmatist, coherence, and redundancy. Nearly all can be called versions of the correspondence theory in one way or another. The agenda of those proffering any of the five versions is to arrive at a final truth or statement about reality. Researchers and scientists can roughly be divided into two camps: those who insist on some sort of positive evidence

that something is true, and those who insist that something is false and determine ways to test statements derivative from theories to demonstrate their fallibility.

An emerging viewpoint is that there is a middle road between the binary term *objective-subjective*, which is called the *experientalist* perspective. This concept revolves around the idea that truth exists only within various contextual systems, bounded by culture and context in any given period of time (Lakoff & Johnson, 1980, p. 193). This version of an ontology is a kind of grand temporality without resorting to subjectivism—the opposite of objectivity—in Greek logic. The breaking away from boxed definitions is the first step in constructing a new ontology for educational leadership and redefining the mental prisms that surround it.

Recently the National Research Council (2002) released a highly controversial publication titled *Scientific Research in Education*, which attempted to establish “rules” for what was and was not “scientific” in establishing truth about educational practices. Their recommendations were about codifying “correct science” for researchers in education. If faithfully extended to thinking and researching educational leadership, these methods would reveal little if anything new about leadership practice in schools (see English, 2007). Churchland (1985) has warned that human reasoning contains a hierarchy of heuristics that were invented mostly at random and opined, “It would be miraculous if human reason were completely free of false strategies and fundamental cognitive limitations, and doubly miraculous if the theories we accept failed to reflect those defects” (p. 36). For this reason it is even more important to probe deeply the mental prisms educational leaders employ to improve the practice of leadership in the schools. The purpose of this chapter has been to provide the basis for a continuing, critical probe into those prisms.

Pursuing Learning Extensions of the Chapter

The learning extensions of the chapter involve the films listed later. Films have been shown to be powerful learning tools to highlight chapter learnings in class work or pursued individually (see also Clemens & Wolff, 1999; Trier, 2003). Most of the films listed can be rented at a minimal cost at a comprehensive video rental store.

***Inherit the Wind (1960)*, *Black and White*, VHS, 2 Hours 8 Minutes**

This is a powerful film about the 1925 Scopes trial in Dayton, Tennessee, in which William Jennings Bryan (twice a candidate for U.S. president) and Clarence Darrow, famous Chicago lawyer and avowed agnostic, squared off over Darwin’s theory of evolution being taught in the public schools. The use of Darwin’s theory of evolution is still a controversial topic in schools today (see Manatt, 1995). One result is the advocacy of so-called “scientific creationism” as an antidote in science curriculums (Numbers, 1992). The rise of “scientific creationism” resulted in the Kansas State Board of Education, in 2000, junking its science curriculum and eliminating teaching the theory of evolution, the Big Bang Theory, and geologic time because it contradicted Genesis in the Bible, 75 years after Scopes (see Baringer, 2000). One of the most

critical scenes in the film, which closely followed actual events (see Weinberg & Weinberg, 1980, pp. 317–329), is the cross-examination of Bryan by Darrow over how Biblical text must be interpreted and cannot be taken literally. It is a powerful example of how language is subject to context and culture and “truth” is situated and therefore dependent rather than independent of such factors. Darrow’s use of argumentation involves one or more theories of truth, which can also be analyzed. This film still resonates with audiences and will be the launch platform for vigorous discussion.

Medicine Man, Color, VHS, Buena Vista, 1 Hour 45 Minutes

While this film is primarily about the disappearance of the Amazon rain forest, it features the story of eccentric scientist Dr. Robert Campbell, who has accidentally discovered a cure for cancer from rare flowers growing atop the tall canopy of jungle trees. However, Campbell can’t replicate his findings after repeated tries. Into the film comes a female coworker to assist him. The film involves a clash between modern civilization and its values and those focused on the primitive culture in which the medicine man rules. The film portrays the role of observation in scientific trials and how missed clues led to an incorrect conclusion. The story line also exposes how, even if followed, the so-called “scientific method” isn’t infallible, an important factor in trying to make progress in the war against disease. The symbol of the medicine man is also one of traditional “faith” versus modern science.

The Magician (1959), Black and White, VHS, California Video Distributors, 1 Hour 41 Minutes

This is one of Ingmar Bergman’s very successful films and was originally called “The Face” (Bergman, 1944/1990, pp. 161–172). This is a film that contrasts the ways of science and the ways of faith/magic. The plot involves a magician who is travelling with his wife and other companions who is stopped by police and must demonstrate his supernatural powers. The magician, played by Max Von Sydow, is humiliated by the police chief and a health official, Vergerus, a doctor who epitomizes early positivistic scientific attitudes toward anything that cannot be logically explained. Vergerus says to the magician’s wife, “. . . you represent what I hate most of all: that which cannot be explained” (Bergman, 1944/1990, p. 167). In the final scene in the film, the magician corners Vergerus in the attic and quickly surrounds him with fear, revealing his scientific faith to be quite shallow. There is much science cannot explain. This is a wonderful film to explore the many meanings of perception and truth.

Gorillas in the Mist (1989), Color, VHS, Universal Pictures, 2 hours 9 Minutes

This is the inspiring film of the life of Dian Fossey, a former physical therapist who gave up a comfortable life in the United States to live in the African mountains to study rare gorillas. Dian learns gorilla ways and becomes familiar with their habit patterns. She constantly fights poachers who kill gorillas for their hands and heads. In the end she is mysteriously killed on her mountain. The film is descriptive of a courageous woman

who braves the wilds and death to follow her dream and to protect her “family.” While Fossey was not a scientist in the Barbara McClintock mold or a political scientist in the Mary Parker Follet category, she offers a glimpse of the kind of single-mindedness and courage both exhibited in their lives.

Writing in Your Personal Reflective Journal

The section in your journal around this chapter should deal with what you believe to be true and beautiful, and how you know or have verified what is true and beautiful. Try and separate what you believe from what you can verify through one of the forms of correspondence described in the chapter. With which form do you feel most comfortable? Why?

Consider Karl Popper’s (1965) idea of *verisimilitude*, that is, the notion that what is believed should be “near” the truth as opposed to the truth itself because one can never directly perceive what is true due to the presence of linguistic paradoxes and cultural filters at work. How are your perceptions “shaped” by language and culture? Have you ever noticed the cultural shaping process at work in schools? Were you aware of it in your own classroom as a teacher? If so, how?

Consider the dividing line between science and faith as portrayed in Ingmar Bergman’s 1959 film *The Magician* or the 1960 film *Inherit the Wind*. Where is this dividing line in your own life or are you aware of it? Are there things about which you require some form of verification? Are there other areas where you are satisfied without these forms of verification? To what extent should human life be governed by the rules of science and verification? As an educational leader, how would you inform your faculty colleagues of your belief systems regarding science, research, and skepticism? Is there a place in your view regarding leadership for faith? If so, describe it.

A Review of Key Chapter Concepts

Use a review of these key chapter concepts as a way to test your own understanding of the premises, ideas, and concepts that are part of this chapter.

absolute objective truth—This is the idea that there is a final statement or situation that is true for all places, all time, and all persons independent of human perception or will. The Greek philosopher Plato (428–347 B.C.) is usually credited with the creation of this notion, called *idealism* (Smith & Smith, 1994, p. 22).

antinomy—This is a condition in a natural language in which two or more inferences can be drawn that are equally correct.

coherence theories of truth—This is the view that experience (empiricism) is not a definitive base on which to select a superior theory. Rather, superior theories contain qualities in greater abundance than inferior ones. Superior theories are more complete, consistent, simple, comprehensive, and rich in content than inferior ones. This concept was disputed by Imre Lakatos (1999), who called the idea that a “superior theory” was also “simpler” *simplicism*. One of the problems was that to judge a theory as better

because it was simpler meant that the two theories were equivalent on all other counts, something that was not likely to exist (pp. 174–175).

correspondence theory—This is the idea that the truth can be discerned when it “fits” or is congruent with the facts, known evidence, or other statements believed to be true. The notion that “more” data becomes conclusive in establishing truth content is related to this idea.

counter ontology—Ontology is the study of reality, or of the question “What is real?” A counter ontology is one that would reject the idea that reality is either objective or subjective. It would posit that reality may be something other than these binary terms suggest.

criterion of efficiency—This is a principle advanced by Herbert Simon (1945) that the metacriterion for sound decision making was to take the shortest path to desired goals (pp. 172–173).

ethnocentrism—This is the notion that people who are not like you are inherently inferior. In the realm of religion, nonbelievers may be called “infidels” and their lack of belief may be attributed to stupidity or the presence of evil in them.

falsificationists—These are researchers or philosophers who believe that science is advanced not by positive assertions or evidence, but by subjecting statements or propositions to rigorous testing to demonstrate their falsity rather than their truthfulness.

indeterminism—This is the idea that a search for stable precedents that are causative of individual actions is futile, or that individual actions are free from a predetermined cause such as fate. Similarly applied on a political scale, no nation is selected by history to rule over others.

infinite regress—This is a recognition that when defining words of terms, such definitions are dependent on other terms that have not been defined. Since there is no end to this dilemma, the problem has been called “infinite regress.” One implication is that since there is no end to this problem, there can be no final meaning of any term or word.

leadership style—This is a term that has enjoyed a wide variety of meanings and interpretations. In this chapter it refers to a term utilized by political scientist James Barber (1985) of Duke University to mean that a person performs three political roles: rhetoric, personal relations, and homework. Respectively, “style” refers to the manner of public speaking, personal relationships, and how a leader manages the “endless flow of details which stream onto his desk” (p. 5). In this reference by Barber, “style” is more than a superficial rendering sketch of how a leader “appears” to others.

principle of contextuality—This is the idea that something can be identified as truthful, but only within a specific context and only with the understanding that many other manifestations or assertions about truth could likewise emanate from the same situation. It is the opposite of absolute objective truth.

rational organizational behavior—This is a concept advanced by Herbert Simon (1945) that an organization's actions could be judged by the results obtained at the lowest possible cost (p. 179).

recapitulation—This is the notion that in the development of a human being, growth follows the general pattern of the development of the species from lower to higher order animal creation. At a certain point in human development, the human fetus has fishlike "gills." This was believed to be the human passing through the evolutionary "fish stage" of development.

semantic theories of truth—This is the idea that truth can be ascertained with either natural or formal "non-natural" languages using logic. Natural languages have their own rules, which may not be logical and lead to a variety of paradoxes (see Etchemendy, 1999, pp. 830–832).

synchism—This is the idea that reality is so overwhelming that no person or group could ever encompass all of it. For this reason, scientific theories are most likely going to be underdetermined.

the critical method—This is a concept of Karl Popper's (1979, p. 16) that he indicated was superior to the "scientific method." The critical method was a procedure to severely test theories, with the belief that none are most likely true in the long run. The critical method was an approach to falsification rather than to establishing truth with "proof."

the liar's paradox—This is a very old problem in discerning truth, sometimes called "Epimenide's paradox." This is a paradox of semantics in which the truthfulness of a statement is being assessed when it is asserting its own falsity. It is attributed to Eubulides, who used it to object to Aristotle's correspondence theory of truth (see Etchemendy, 1999, pp. 830–832).

verisimilitude—This is a concept of Karl Popper's (1965, p. 229) that stands for "truth." The idea is that since one can never really know truth, the role of the researcher or scientist is to come as close to it as possible. In this pursuit one is apt to know more accurately what is not true.

world view—This is a term from James Barber's (1985) book on presidential performance. It refers to the way a leader "sees" things and how he or she confronts "reality." Barber stresses that "world view" is what a leader "pays attention to, and a great deal of politics is about paying attention" (p. 5).