Chapter 2

History of the Field of the Psychology of Human Thought

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Why should students bother to learn anything at all about the history of the field? On the very day I write this chapter, a younger colleague, an assistant professor, told me she is interested in the future of the field, not its past. Yet, there are three major reasons to study the history of psychology in general, and of the psychology of human thought, in particular.

First, many contemporary ideas can be better understood if we understand their historical context. For example, when trying to understand ideas about whether propensities toward language are inborn or acquired, it helps to understand the history of rationalism and empiricism and how they have influenced this and other debates about human propensities. Indeed, the debate between those who emphasize inborn traits and those who emphasize environmental influences truly cannot be well understood without understanding the nature of rationalism and empiricism. Moreover, current views on gene x environment interaction are a product of a long and, as it happens, largely fruitless debate between those who wanted to understand human behavior as almost entirely genetically programmed (some early behavior geneticists) and those who wanted to understand it as driven almost entirely by experiences in the environment (some early behaviorists).

Second, knowledge of history prevents us from claiming original credit for ideas that are steeped in

the history of the field. Put another way, historical knowledge prevents us from "reinventing the wheel." Imagine if society had no knowledge of past inventions, and instead of dreaming up new inventions, kept reinventing the same things, again and again. Science is no different. For science to advance, scientists have to be aware of what ideas have already been proposed.

Third, we need to know which ideas from the past worked well and which worked poorly. Knowledge of the history of a field can prevent us remaking mistakes that others already have made. When one reads the history of the field, one sometimes feels amazement at ideas people once held, such as of the validity of phrenology (studying patterns of bumps on the head) for understanding people's personalities. But if we do not learn from these past mistakes, what is to stop us from making them again?

For example, why bother to read how Jerome Bruner and his colleagues studied concepts and concept learning in 1956 (Bruner, Goodnow, & Austin, 1956)? The idea of studying such simplified concepts was that one could study some kind of "pure" concept formation, unfettered and unimpeded by individual and group differences in prior knowledge. If different shapes, sizes, color names, and so forth were used, everyone would be at the same level of advantage–and disadvantage.

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But later studies revealed that things did not work that way. Rosch (1975) found that how people form concepts about concrete items, such as kinds of animal or plant life, bears little resemblance to how people form concepts about abstract items. Moreover, concepts have a "basic level," a level at which we tend to think most easily about them. For example, people find it easier to think in terms of concepts at the level of "bird" than at the higher level of "chordata," even though the latter is a higher level. Understanding the evolution of concept-formation research will help future investigators realize that there may be differences in the way more abstract and more concrete concepts are conceived, so that they do not again make the mistake of thinking that all concepts are processed in the same way. Similarly, there are differences in the way people solve abstract, structured, IQ-test-like problems and more concrete, practical, and unstructured problems such as how to choose a mate (Frensch & Funke, 1995; Sternberg et al., 2000). Thus, one might wish to study problem solving in contexts that resemble the universe of tasks to which one wishes to generalize one's conclusions.

2.1 The Dialectical Development of Ideas

Many ideas in psychological science, in general, and in the field of human thought, in particular, proceed in a kind of dialectical progression. The idea of a **dialectic** was formulated by the philosopher Georg Hegel (1807/1931), who suggested that people think in one way for a while, a *thesis*; then they move on to a contrasting and sometimes contradictory way of seeing things, an *antithesis*; finally, they move on to an integrated view, a *synthesis*, whereby two ideas that had seemed contradictory no longer seem that way, but rather seem as though they can be integrated and understood as both being true, perhaps at different levels.

2.2 Early Western Antecedents of the Psychology of Human Thought

Where did the study of human thought begin, and when did it happen? The mythical origins of the psy-

chology of human thought can be traced to a Greek myth of *Psyche*, whose name conveys the idea of a "breath of life," or put another way, the soul, believed once and still by many to inhabit the body during life and then to leave the body upon a person's death. The Greek term *nous* (which once was believed to be a bodily organ responsible for the clear and coherent perception of truth) is an uncommon English word for the mind; *nous* particularly referred to thinking that involved deep reasoning or even reasoning that was divinely inspired. In the ancient Greek world, the body and the mind were viewed as largely distinct. The mind might cause activity in the body, but the mind nevertheless was independent of the activity of the body. This dialectic–of the mind and body as entirely separated or as unitary continues even into the present day.

The origins of the study of the psychology of human thought can be traced to two distinct approaches to the understanding of human behavior: philosophy and physiology. Today, these two fields of inquiry are viewed almost as dialectically opposed. That is, philosophy is often viewed as involving speculative methods and physiology as involving empirical, largely scientific methods. But in ancient Greek times, many physiologists as well as philosophers believed that truth could be reached without the benefit of empirical methods.

As time went on, philosophy and physiology diverged more and more, with physiologists seeking out empirical methods that never interested philosophers. As time went on, several dialectics kept arising and re-arising in the study of the human mind—whether the mind and body are one entity or distinct entities; whether the mind is best understood through rationalistic or empirical methods; whether abilities are genetically or environmentally determined. The synthesis stage of each dialectic involved the recognition that the two positions are not necessarily opposed to each other—the ideas could be integrated. For example, abilities almost certainly have both genetically and environmentally influenced components, as well as a component influenced by the interaction between genes and environment.

Hippocrates, the ancient Greek physician and philosopher (ca. 460–377 B.C.E.) believed in **mind-body dualism**, or the notion that whereas the body

is composed of physical substance, the mind is not. Hippocrates proposed that the mind resides in the brain. Although today this idea sounds rather obvious, many of his predecessors had different ideas about where the mind resided, ranging from the heart to the gods.

Plato (ca. 428–348 B.C.E), who lived at roughly the same time as Hippocrates, agreed that the mind resided in the body, and in particular, in the brain. In contrast, Aristotle (384–322 B.C.E.) believed that the mind resided in the heart. These two philosophers set up three important dialectics for the psychology of human thought—the relationship between the mind and the body, the use of empirical observations versus philosophical introspections as a means for discovering the truth, and the original source for our ideas.

Plato believed that reality inheres not in the concrete objects that we become aware of through our senses, but rather in abstract forms that these objects somehow represent. That is, the reality of you is not in your physical substance but rather in the abstract ideas you represent. The computer (or other device) on which you are reading this text is not real; rather, the abstract idea behind it is real. In contrast, Aristotle believed, as you probably do, that the reality of yourself is in your concrete substance and that the reality of your computer (or other device) is in that concrete device, not in the idea of it. According to Aristotle, the idea is derivative, rather than primary.

Plato's ideas led to the philosophy of mind-body dualism, whereas Aristotle's ideas led to *monism*, or the idea that the body and mind are of a single kind of reality, existing in a single plane. In this view, the mind is a byproduct of anatomical and physiological activity. It has no separate existence apart from this activity.

These different ideas about the nature of reality led Plato and Aristotle to different methodologies for investigating the nature of human thought. Plato was a **rationalist**, believing that introspection and related philosophical methods of analysis could and should be used to arrive at truth. After all, what purpose would there be to studying empirically the imperfect copies of reality that concrete object represent? Rather, one would be better off using reflection to understand reality in the realm of abstract ideas.

In contrast, Aristotle was fundamentally an **empiricist**, believing that the nature of human thought could be best understood through observation and experimentation. We learn about reality by observing concrete objects, including ourselves. Because reality inheres in concrete objects, we learn best about them by studying them empirically.

Further, Plato believed that ideas are largely innate. That is, we are born with virtually all the ideas we have. Experience merely brings them out. In the dialogue *Meno*, Plato claimed to demonstrate (through Socrates, who generally was the main protagonist in the dialogues) that all the ideas about geometry that a slave boy had in his head were there at the boy's birth. Experience merely brought them out. In contrast, Aristotle believed that ideas generally arise through experience.

All of these dialectics–whether the mind and body are one entity or distinct entities; whether the mind is best understood through rationalistic or empirical methods; whether abilities are genetically or environmentally determined—are still active in research today that seeks to understand the human mind. Psychological scientists disagree even today as to the extent to which mind and body are distinct, on the roles of rationalistic and empirical methods, and on the origins of abilities.

2.3 Intermediate Periods in the Western History of Understanding Human Thought

During the early Christian era (200–450 C.E.) and the Middle Ages (400–1300 C.E.), rationalism and empiricism became subsidiary to the primacy of religious faith. Neither method was viewed as valid unless it demonstrated what was already "known" to be true on the basis of Christian doctrine. (Other views evolved in Eastern countries, but because modern psychological science is largely based on the Western tradition, that is what will be covered here.) This kind of logic—which is perhaps as prevalent today as in the past, just in different forms—shows the **fallacy of confirmation bias**, whereby we seek out information that is consistent with what we believe and ignore or reject information that is not

consistent with our beliefs. More and more today, through social media and other means, people only read news feeds and websites that present views that correspond to those the individual already has.

Modern views of science were born during the period of the Renaissance, roughly from the 1300s to the 1600s. The focus of psychological thinking shifted from God to humanity. Strict control of thinking in terms of religious doctrine came under attack. Now empirical observation, often guided by underlying theories, came into vogue as a preferred method for understanding human thought and other human phenomena.

2.4 The Early Modern Period (1600s to 1800s)

Interestingly, the Early Modern Period saw a replay of some of the dialectics that distinguished Plato and Aristotle. René Descartes, a philosopher, agreed with Plato's emphasis on rationalism as the best way to seek truth, and Descartes, like Plato, was a dualist. Descartes further believed that knowledge was innate. In contrast, John Locke (1632–1704), also a philosopher, sided largely with Aristotle, believing in the primacy of empirical methods, monism, and the idea that all knowledge is acquired from experience. Locke took this view to an extreme, arguing that, at birth, the mind is a *tabula rasa*, or blank slate. We acquire knowledge through sensory experience, and thus the experiences we provide children are the keys to what they are able to learn in their lives. David Hume, another empiricist philosopher, sided with Locke in the belief that knowledge is acquired. He further pointed out that all our causal inferences are indirect. We see one thing happen, and then quickly and proximally, another, and infer causality. We can never see causation directly occur—we can only come to believe it is true.

Two important successors to Descartes and Locke were the philosophers John Stuart Mill (1806–1873) and Immanuel Kant (1724–1804). Mill saw the mind entirely in mechanistic terms. He believed that the laws of the physical universe could explain everything, including our lives as human beings. His was an extreme form of monism, sometimes referred

to as **reductionism**, a view that reduces the role of the mind to the status of the physical and chemical processing occurring in the body. Those today who see the mind as nothing more than physiological operations of the brain and its accompanying central nervous system might be viewed as reductionists.

Kant provided syntheses to many of the theses and antitheses that had been proposed before him. He sought to understand how the mind and the body are related, rather than looking at one as subservient to the other. Kant also allowed roles for both *a priori* (rationally determined) and *a posteriori* (empirically determined) knowledge. What is perhaps today most important about Kant's contribution is the recognition that philosophical debates do not have to be "either-or," but rather can be "both-and," seeking roles, for example, both for inborn knowledge and for empirically derived knowledge.

2.5 The Modern Period of the Psychology of Human Thought

The modern period of the psychology of human thought can be seen as beginning with **structuralism**, which sought to understand the structure (configuration of elements) of the mind by analyzing the mind in terms of its constituent components or contents (see Table 2.1 for a comparison between this and other modern schools of thought). At the time structuralism was introduced, scientists in other fields also were trying to understand constituents, such as the periodic table of elements and the biochemical constituents of cells. Thus, structuralism was a part of a large movement in science to break things down into their basic elements.

An important pre-structuralist was the German psychologist Wilhelm Wundt (1932–1902). Wundt argued that the study of cognition should concentrate on immediate and direct experience, not mediate and indirect experience. For example, if a subject looked at a tree, what would be important to Wundt, from a psychological point of view, would not be the identification of the object as a tree or a maple tree, but rather one's seeing a large cylinder with a rough brown surface jutting out into the air with green protrusions (i.e., leaves) attached to smaller cylin-

Table 2.1: Main Schools of Thought in the History of the Psychology of Thought.

School of Thought	Main Emphasis
Structuralism	Analysis of thought into constituent components
Functionalism and pragmatism	Understanding "why" of behavior; practical uses of thought and behavior
Associationism	Study of mental connections between stimuli and responses
Behaviorism	Study of observable behavior and how rewards determine behavior
Gestaltism	Study of thought and behavior as holistic, not just as a sum of parts
Cognitivism	Understanding the mental processes and representations underlying thought

drical types of objects (i.e., branches) jutting out from the main cylinder. Wundt suggested that the best way to study immediate experience was through introspection—that is, subjects reporting their direct and immediate experiences. Wundt believed that people could be trained to be experts at introspection, so that they would report exactly what they sensed without the mediation of their knowledge of concepts and categories (such as *tree* or *maple*).

Perhaps the first major structuralist was Edward Titchener (1867-1927), whose views were similar to Wundt's. Although Titchener started out as a strict structuralist, later in his career he branched out and considered other ways of studying human thought. Titchener's change of mindset illustrates an important lesson about scientific creativity: Scientists do not have to get stuck in, or fixated upon, the ideas that characterize their early work. They can "grow on the job," and themselves think dialectically, with their ideas evolving along with their careers.

Structuralism is of interest today primarily in an historical sense, because it was shown to have a number of problems associated with it. First, as time went on, the number of "elementary sensations" it proposed grew too large to be manageable. There seemed to be no limit, and so its role in reducing experience to a manageable number of elementary sensations was lost. Second, to the extent it was useful, it was for understanding simple rather than complex aspects of human behavior, such as problem solving, reasoning, or language. Third, its heavy reliance on introspection came under attack. While introspection might be of some use, it scarcely seemed to be the only method or even a primary method by which

knowledge about thinking could be gained. Moreover, people's introspections, no matter how much the people are trained, are subject to various kinds of biases as a function of their past experiences. Finally, different people had different introspections, so that it was difficult to gain agreement as to just what the basic sensations were.

2.6 Functionalism

Functionalism looks at the functional relationships between specific earlier stimuli and subsequent responses; in other words, it asked the question of why people behave the way they do—how do events in a person's life lead the person to behave in certain ways but not others? Thus, functionalists asked a different set of questions from structuralists, concentrating less on *what* people experienced and more on *why* they experienced it.

Again, there is an important lesson to be learned from the evolution of psychological thinking from structuralism to functionalism. That lesson is that different schools of, or approaches to psychological thought, differ at least as much in the questions they ask as in the answers they obtain. When psychological science moves on, it is often not so much that the answers change as that the questions change.

The core beliefs of structuralists—seeking elementary sensations through analyses of introspection—were pretty well defined. The core beliefs of functionalists never cohered quite as well. Indeed, they used a variety of methods to answer their questions about the "why" of human behavior.

2.7 Pragmatism

Pragmatism, an outgrowth of functionalism, holds that knowledge is validated by its usefulness. The main question pragmatists are concerned with is that of how knowledge can be used to make some kind of a difference.

One of the most well-known pragmatists was William James (1842–1910), who was not only a psychologist but also a philosopher and a physician. His landmark work was *Principles of Psychology* (James, 1890/1983). It is rare for a scholar to enter the pantheon of "most distinguished psychologists" for just a single work, but James managed to do it with that one major work.

James critiqued structuralism's focus on minute details of experience. He believed instead that psychology needs to focus on bigger ideas. He is particularly well known for his theorizing about consciousness, which he believed was the key to people's adaptation to their environments.

John Dewey (1859–1952) applied pragmatism to a number of different areas of thought, most notably, education. Dewey emphasized the role of motivation in education (e.g., Dewey, 1910). In order to learn effectively, a student needs to see the use of what he or she learns. If the learning is irrelevant to a student's life, the student will have little incentive to process deeply the information that is taught. One way educators can motivate students is by having the students choose their own problems. In that way, the students will choose problems that interest them, whether or not they interest the teachers.

Dewey also believed in the value of applied research. Much of the research being done, he thought, had no obvious use and hence was not likely to make a long-lasting contribution. Pragmatism would argue for applied or at least life-relevant research that could be put to some use, even if not immediately.

Pragmatism remains a school of thought today: One frequently hears politicians argue for educational programs that prepare students for careers and that focus on knowledge that is readily applicable. But the advantages of pragmatism are, in some ways, also its disadvantages. First, it can lead to short-sightedness. Much of the most important applied research of today emanated from the basic research

of yesterday. Second, the school of thought raises the question of "useful to whom"? Is it enough for an education to be useful to just one person? How about if it is useful to one person but useless to another? Finally, pragmatism, in general, can have a limited notion of usefulness. What is useful to a person at one time, in the short run, may not be useful to the person in the long run.

2.8 Associationism

Associationism concerns how ideas and events become associated with one another in the mind. Thus, it serves as a basis for a conception of learning—that learning happens through the association of ideas in the mind.

One of the most influential associationists was the German psychologist Hermann Ebbinghaus (1850–1909), who was the first empirical investigator to apply associationist ideas experimentally. Whereas Wundt was an introspectionist, Ebbinghaus was an experimentalist. To the extent that he used introspection, it was about himself. Ebbinghaus also differed from Wundt in that his main subject was himself.

Edwin Guthrie (1886–1959) expanded upon Ebbinghaus's ideas about associationism, proposing that two observed events (a stimulus and a response) became associated with each other through close occurrence in time (temporal contiguity). In this view, stimulus and response become associated because they repeatedly occur at about the same time, with the response following the stimulus. Guthrie, however, studied animals rather than himself.

Edward Lee Thorndike (1874–1949) developed these ideas still further, suggesting that what is important is not mere temporal contiguity, but rather "satisfaction," or the existence of some reward. According to Thorndike's *law of effect*, a stimulus tends to produce a certain response (effect) over time if an organism is rewarded (satisfaction) for that response.

Associationism in its original form has not survived. The idea that complex behavior could be explained just on the basis of simple associations has never really worked well. None of the associationists ever gave a persuasive account of problem

solving, reasoning, decision making, or any other higher process.

2.9 Behaviorism

Behaviorism is the view that psychology should deal only with observable behavior. It is in a sense an extreme form of associationism. It originated as a dialectical reaction against the focus on personally subjective mental states as emphasized both by structuralism and functionalism. Radical behaviorists argue that arguments regarding (internal) thought processes are merely speculations. In their view, although such speculations may have a place in philosophy, they do not have a place in the science of psychology. The behaviorist view was part of a movement called *logical positivism*, according to which the basis of all knowledge is sensory perception.

The father of the radical behaviorist movement was the American psychologist John Watson (1878–1958). Watson believed that psychology should focus only on observable behavior. Watson worked primarily with rats in his research, although he became famous, or infamous, for an experiment in which he conditioned a young child, "Little Albert," to fear a white rat, a fear that later generalized to other animals, such as a white rabbit (Watson & Rayner, 1920). A successor to Watson, Clark Hull (1884–1952), believed that it would be possible to synthesize the work of theorists like Watson and Guthrie with the work of Pavlov on involuntary conditioning. He constructed elaborate mathematical models to achieve such a synthesis.

A famous successor to Hull was B. F. Skinner (1904–1990), also a radical behaviorist. Skinner believed that all behavior could be understood by organisms emitting responses to environmental contingencies. Skinner applied his ideas about behaviorism to many different kinds of behavior, at first learning, but then also language and problem solving. His views may have had some success in accounting for simple learning but did less well in accounting for complex behavior.

Skinner also proposed that it would be possible to construct a Utopian society based on his ideas about instrumental conditioning (i.e., conditioning in which responses are shaped by rewards and non-rewards of behavior). Because Skinner believed the environment controls behavior, the idea of the Utopia was to create environments that would control behavior so that it would conform to the ideals of the community.

2.10 Gestalt Psychology

Gestalt psychology sought to understand behavior in terms of organized, structured wholes; that is, instead of breaking down behavior and its underlying cognition into constituent parts, Gestalt psychology sought to understand behavior holistically. Three of the main psychologists behind the movement, all German, were Max Wertheimer (1880–1943), Kurt Koffka (1886–1941), and Wolfgang Köhler (1887–1967). The Gestaltists applied their framework to many aspects of psychology, and especially to perception and complex problem solving. For example, they suggested that insight problems, in which one is blocked from any kind of solution until one has an "ah-ha" experience, could be understood in terms of a holistic restructuring of a problem to reach a solution. An example would be the nine-dot problem, in which one has to connect nine dots, arranged in three rows of three, in four straight lines without taking one's pencil off the paper. The "insight" for solving the problem is that one has to go outside the implicit periphery of the nine dots in order to solve the problem.

2.11 Cognitivism

The main current paradigm for understanding the psychology of human thought is **cognitivism**, which is the belief that much of human behavior is comprehensible in terms of how people represent and process information. Cognitivists seek to understand elementary information processes and how they are represented in the mind.

Early cognitivists, such as Miller, Galanter, and Pribram (1960), argued that both behaviorist and Gestalt accounts of higher processes are inadequate. Instead, they suggested that psychologists need to

understand cognitive processes. The unit they proposed was the TOTE (Test-Operate-Test-Exit). The idea behind this unit is that when we need to solve a problem, we first need to test the difference between where we are and where we need to be to reach a solution. We then operate to reduce the difference between our current state and the solution state. Then we test to see if we are done. If not, we operate again. And we keep going until we reach a solution to the problem, at which point we exit.

Two other pioneers in the study of human thought were Newell and Simon (1972), whose book *Human Problem Solving* showed how a relatively small set of elementary information processes could be used to solve problems of a wide variety of kinds. Neisser (1967), in his book *Cognitive Psychology*, suggested a process called analysis-by-synthesis, in which hypotheses are formulated and compared with data in the environment until one of the hypotheses produces a match to the data. In a later book, *Cognition and Reality* Neisser (1976) emphasized the importance of studying complex human behavior in its natural contexts. Today, cognitivism thrives, but other schools of thought are complementing it. For example, more and more cognitive psychologists are seeking to understand not only the cognitive bases of complex behavior, but also its neuropsychological underpinnings.

Acknowledgement

Summary

The history of the study of human thought can be understood in terms of a dialectical progression of ideas. Many of these ideas originated with the Greek philosophers, Plato and Aristotle, who, respectively, believed in the importance of rationalist and empirical methods for understanding human thought. Plato's ideas formed the basis for mind-body dualism.

During the Middle Ages, ideas about human thought were seen as deriving from what individuals thought they knew about their relation to God. In the Renaissance, the scientific method began to gain ascendancy.

The rationalist and empiricist schools of thought gained exponents in philosophers René Descartes and John Locke, respectively. Immanuel Kant synthesized many of their ideas, showing that the methods of both rationalism and empiricism could be important in acquiring new knowledge.

In the early modern era, structuralism argued for the importance of decomposing sensations into their most elementary constituents. Functionalism, in contrast, emphasized the "why" of behavior rather than its constituents. An offshoot of functionalism, pragmatism, suggested we look for how knowledge could be used. Associationism argued for the importance of connections between ideas; behaviorism, especially in its radical form, suggested that only observable behavior should be studied by psychologists. Behaviorists were particularly concerned with the role of environmental rewards in behavior. Gestaltists suggested that behavior be studied as wholes, because the whole is more than the sum of its part. Cognitivism, an important school even today, suggests the importance of understanding the mental structures and processes underlying behavior.

Review Questions

1. How do rationalism and empiricism differ?

2. What is a dialectic?

3. What is mind-body dualism?

4. What were some of the limitations of the associationistic way of understanding human thought?

5. What advantages did cognitivism have over behaviorism as a way of understanding human thought?

Hot Topic

The dialectic plays a role not only across investigators over time but also within a single investigator over time (Sternberg, 2014, 2015). It is important for researchers to look not only at how research has evolved over historical time but also how the researcher's research program has evolved over the course of a career. If the researcher finds no evolution, then he or she perhaps has not been as creative as he or she could have been.

In my own research, I originally proposed an information-processing "alternative" to psychometric approaches to intelligence. At the time, the late 1970s, I saw an approach emphasizing information-processing components as replacing structural psychometric factors. But I later synthesized what had been a thesis and antithesis. Components and factors were compatible, with factors obtained through analysis of variation between people and components obtained through analysis of variation across stimuli. In other words, both components and factors were valid, but as different partitions of variation in a psychological study.

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Later this synthesis became a new thesis, as I argued that the approach I had used was too narrow and failed to take into account creative and practical aspects of intelligence, which complemented the analytical aspects dealt with in psychometric and cognitive approaches. I thought that I now had "the answer." But then I came to view the answer as incomplete, because I realized what mattered more than one's particular cognitive or other skills was how one utilized these skills. So I came to argue that "successful intelligence" is the construction of a life path that makes sense in terms of one's own goals and initiatives, by capitalizing on one's strengths and compensating for or correcting one's weaknesses. But later, I came to see even this view as incomplete, because it neglected wisdom, or using one's knowledge and skills to help achieve a common good. And in today's world, I came to believe, what most is missing is not IQ points—there are lots of smart people, including so many people in universities—but rather the use of those "smarts" to help others and the world, not just oneself and one's loved ones.

In sum, the concept of a dialectic applies not only between but also within researchers. People need to realize and appreciate how their own ideas evolve and how, through the course of a career, one becomes not just older, but hopefully, in one's research and life, wiser.

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Glossary

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mind-body dualism The notion that whereas the body is composed of physical substance, the mind is not. 16

pragmatism An outgrowth of functionalism, holds that knowledge is validated by its usefulness. 20

rationalist Believing that introspection and related philosophical methods of analysis could and should be used to arrive at truth. 17

reductionism A view that reduces the role of the mind to the status of the physical and chemical processing occurring in the body. 18

structuralism A school of thought in psychology that seeks to understand psychological phenomena in terms of their simplest mental elements and the ways in which these mental elements combine. 18