8 Thinking, Language, and Intelligence

Chapter Preview

Our active brain both uses and misuses the information it receives, perceives, stores, and retrieves. We are both rational and irrational. Concepts, the building blocks of thinking, simplify the world by organizing it into a hierarchy of categories. Concepts are often formed around prototypes, or the best examples of a category.

When faced with a novel situation for which no well-learned response will do, we may use problem-solving strategies such as trial and error, algorithms, heuristics, and insight. Some cognitive strategies may lead us astray, however. These include confirmation bias and fixation. Overconfidence, belief perseverance, and framing further reveal our capacity for error. Still, human cognition is remarkably efficient and adaptive. For example, creative thinkers exhibit divergent thinking. And, with experience, our intuition becomes more efficient and adaptive, and we grow adept at making quick, shrewd judgments. Research has shown that other species share many cognitive abilities with humans.

Language facilitates and expresses our thoughts. Children's language develops from simplicity to complexity. Noam Chomsky suggests that children are born with a built-in readiness to learn grammar. Childhood does seem to represent a critical period for learning language. Those not exposed to either a spoken or signed language until age 7 gradually lose their ability to master *any* language. Language processing illustrates how the mind's subsystems are localized in particular brain regions, yet the brain acts as a unified whole.

We often think in images, and mental practice is now an accepted part of training for many athletes. A lively debate concerns whether language is uniquely human; it has been fueled by studies of animals, particularly chimpanzees, who have developed considerable vocabularies and who can string words together to express meaning. Although apes have considerable cognitive ability, skeptics point out important differences between apes' and humans' abilities to order words using proper grammar.

Intelligence is generally considered to be the ability to learn from experience, solve problems, and adapt to new situations. Psychologists debate whether intelligence is one general ability or several specific abilities. While a certain level of intelligence is necessary for creativity, beyond that level, the correlation is weak. More recently, some theorists have expanded the definition of intelligence to include social intelligence, especially emotional intelligence.

Modern intelligence testing began more than a century ago in France when Alfred Binet developed questions that helped predict children's future progress in the Paris school system. Lewis Terman of Stanford University used Binet's ideas to develop the Stanford-Binet intelligence test. German psychologist William Stern derived the formula for the famous intelligence quotient, or IQ. Modern aptitude and achievement tests are widely accepted only if they are standardized,

reliable, and valid. Studies of twins, family members, and adopted children point to significant genetic determinants of intelligence scores. These and other studies also indicate that environment significantly influences intelligence test scores. Environmental differences are perhaps entirely responsible for racial gaps in intelligence. Although gender similarities far outnumber gender differences in abilities, we find the differences more interesting.

Intelligence tests, which predict performance in a given situation, are necessarily "biased" in the sense that they are sensitive to performance differences caused by cultural experiences. However, the major tests are not biased in that they predict as accurately for one group as for another. Stereotype threat can adversely affect performance and sometimes appears in intelligence testing among Blacks and women.

Chapter Guide

Text Questions/Online Discussion Forum: In Your Everyday Life

At the end of each chapter is at least one "In Your Everyday Life" question that helps students relate the topics to their own lives. We repeat those questions here because they also serve as useful prompts for online or other discussion forums.

1. What are the things you fear? Are some of those fears out of proportion to statistical risk? Are there other areas of your life where you need to take more precautions?
2. Can you recall a time when contradictory information challenged one of your views? Was it hard for you to consider the opposite view? Did you change your mind?
3. Do you think that young children should be required to learn a second language? Why or why not?
4. How could you use mental practice to improve your performance in some area of your life?
5. Can you think of a time when you felt an animal was communicating with you? How might you put that to a test?
6. The concept of multiple intelligences suggests that different people have different gifts. What are yours?
7. How have environmental influences shaped your ability to reach your academic potential?

Introductory Exercise: Fact or Falsehood?

The correct answers to Handout 8–1 are as follows: 1. F 2. F 3. T 4. F 5. T 6. T 7. F 8. T 9. F 10. T

► Project: The Need for Cognition Scale (p. 495)

Thinking

► Exercises: Cognitive Complexity (p. 496); Introducing Prototypes (p. 497)
► PsychSim 5: My Head Is Spinning (p. 497)

8-1. *Define* cognition, *and describe the functions of concepts.*

Cognition refers to the mental activities associated with thinking, knowing, remembering, and communicating.

To think about the countless events, objects, and people in our world, we organize them into mental groupings called ***concepts***. Although we form some concepts by definition—for example, a triangle has three sides—more often we form a concept by developing a ***prototype,*** a mental image

or best example of a particular category. For example, a robin more closely resembles our "bird" category than does a penguin. The more closely objects match our prototype of a concept, the more readily we recognize them as examples of a concept. Once we place an item in a category, our memory of it later moves in the direction of the category prototype.

► Exercises: Dice Games to Demonstrate Problem Solving (p. 498); The "Aha!" Experience (p. 499); Confirmation Bias (p. 502); Functional Fixedness: A Type of Fixation (p. 503); Mental Set and Luchin's Water Jug Problem (p. 504)
► Lecture: Jokes, Riddles, and Insight (p. 501)
► Projects: The Tower of Hanoi Problem (p. 497); Problem-Solving Strategies (p. 498)
► Exercise/Lecture Break: Experts Solving Problems (p. 501)

8-2. *Describe the strategies that help us solve problems, and identify the tendencies that work against us.*

Problem solving is one of our most impressive cognitive skills. We approach some problems through *trial and error,* attempting various solutions until stumbling on one that works. For other problems we may follow a methodical rule or step-by-step procedure called an ***algorithm***. Because algorithms can be laborious, we often rely instead on simple thinking strategies called ***heuristics***. Sometimes, however, we are unaware of using any problem-solving strategy; the answer just comes to us as a sudden flash of ***insight***.

► Exercises: Confirmation Bias (p. 502); Functional Fixedness: A Type of Fixation (p. 503); Mental Set and Luchin's Water Jug Problem (p. 504)
► Lecture: The Confirmation Bias and Social Judgments (p. 502)

One obstacle to problem solving is our eagerness to search for information that confirms our ideas, a phenomenon known as ***confirmation bias.*** This can mean that once we form a wrong idea, we will not budge from our illogic.

Once we get hung up on an incorrect view of a problem, it's hard to approach it from a different angle. This is ***fixation***—the inability to see a problem from a fresh perspective. It may interfere with our taking a fresh approach when faced with problems that demand an entirely new solution.

► Exercises: The Limits of Human Intuition (p. 495)
► Lecture: Differences in Thinking Style [Analytical Versus Intuitive] (p. 514)

8-3. *Explain what is meant by intuition, and describe how the availability heuristic, overconfidence, belief perseverance, and framing influence our decisions and judgments.*

As we make decisions each day, we seldom take the time and effort to reason systematically. We just follow our ***intuition,*** our fast, automatic, unreasoned feelings and thoughts.

► Exercises: The Availability Heuristic (p. 504); The Representativeness Heuristic (p. 505); The Base-Rate Fallacy (p. 506); The Anchoring Heuristic or Bias (p. 507); The Overconfidence Phenomenon (p. 509); Framing Decisions (p. 509); Framing Alternatives and Human Irrationality (p. 510)
► Lectures: The Projective Way of Knowing (p. 507); The Sunk Cost Fallacy (p. 508); The Disjunction Fallacy or Irrational Prudence (p. 511); Thinking Errors and International Conflict (p. 512); Risks in Everyday Life (p. 512); Perceiving Risk and the Fear of Global Warming (p. 513)

The ***availability heuristic*** operates when we base our judgments on the availability of information in our memories. If instances of an event come to mind readily, we presume such events are common. Heuristics enable us to make snap judgments. However, these quick decisions sometimes lead us to ignore important information or to underestimate the chances of something happening.

Our intuition about risk can be wrong because of four forces that feed our fears. First, we fear what our ancestral history has prepared us to fear. Also, we fear what we cannot control, what is immediate, and what is most readily available in memory. To improve our risk assessment, we need to check our fears against the facts and resist those who lead us to fear the wrong things.

Overconfidence, the tendency to overestimate the accuracy of our knowledge and judgments, can have adaptive value. People who err on the side of overconfidence live more happily, find it easier

to make tough decisions, and seem more believable than others. Moreover, given feedback about their predictions people can learn to be more realistic about the accuracy of their judgments.

We exhibit ***belief perseverance,*** clinging to our ideas in the face of evidence that proves us wrong because the explanation we accepted as valid lingers in our minds. Once beliefs are formed and justified, it takes stronger evidence to change them than it did to create them. The best remedy for this form of bias is to make a deliberate effort to consider evidence supporting the *opposite* position.

The same issue presented in two different but logically equivalent ways can elicit quite different answers. This ***framing*** effect suggests that our judgments and decisions may not be well reasoned, and that those who understand the power of framing can use it to influence important decisions—for example, by wording survey questions to support or reject a particular viewpoint.

► Exercise: The Limits of Human Intuition (p. 495)

8-4. *Describe how smart thinkers use intuition.*

Although human intuition is sometimes perilous, it can be remarkably efficient and adaptive. Intuition is born of experience. As we gain expertise in a field, we become better at making smart and quick judgments. Experienced nurses, firefighters, art critics, and hockey players learn to size up a situation in an eyeblink. Smart thinkers recognize that their gut reactions are terrific at some things, such as knowing that fuzzy-looking objects are far away. Research shows that in making complex decisions, we benefit by letting a problem "incubate" while we attend to other things.

► Lecture: Creative People—Ten Antithetical Traits (p. 560)
► Exercises: Assessing Creativity (p. 559); Coding Intelligent/Creative Behavior (p. 560)

8-5. *Define* creativity, *and identify the factors that foster it.*

Creativity—the ability to produce ideas that are both novel and valuable—requires a certain level of aptitude, but beyond a score of about 120, the correlation between intelligence scores and creativity disappears. Robert Sternberg views creativity as a separate form of intelligence, with five necessary parts: expertise, imaginative thinking skills, a venturesome personality, intrinsic motivation, and a creative environment.

► Lecture: Do Animals Plan Ahead? (p. 514); Kanzi, a Remarkable Bonobo (p. 515)

8-6. *Describe what we know about thinking in other species.*

Animals show remarkable capacities for thinking. Both humans and other animals (1) form concepts, (2) have a numerical ability, (3) display insight, (4) use tools, and (5) transmit cultural patterns.

Language

► Lectures: Vanishing Languages (p. 517); Universals of Language (p. 518); Language Development (p. 519)
► PsychSim 5: Dueling Brains (p. 517)
► Exercise/Lecture Break: Observing Language Development (p. 519)

8-7. *Identify the milestones in language development, and describe how we acquire language.*

Children's *language* development moves from simplicity to complexity. Their *receptive language* abilities mature before their *productive language*. Beginning at about 4 months, infants enter a ***babbling stage*** in which they spontaneously utter various sounds at first unrelated to the household language. By about age 10 months, a trained ear can identify the language of the household by listening to an infant's babbling. Around the first birthday, most children enter the ***one-word stage,*** and by their second birthday, they are uttering two-word sentences. This ***two-word stage*** is characterized by ***telegraphic speech***. This soon leads to their uttering longer phrases, and by early elementary school, they understand complex sentences.

►Lecture: Talking With Our Hands (p. 521)

Noam Chomsky notes that children are born with a built-in readiness to learn grammar rules. He argues that children acquire untaught words and grammar at too fast a rate to be explained solely by training. Moreover, there is a *universal grammar* that underlies all human language.

Childhood seems to represent a *critical* (or "sensitive") *period* for certain aspects of learning. Research indicates that children who have not been exposed to either a spoken or signed language until age 7 gradually lose their ability to master *any* language. Learning a second language also becomes more difficult after the window of opportunity closes. For example, adults who attempt to master a second language typically speak it with the accent of their first.

►Lecture: The Smart-Talk Syndrome (p. 522)

8-8. *Identify the brain areas involved in language processing and speech.*

Broca's area, an area in the left frontal lobe, controls language expression by directing the muscle movements involved in speech. ***Wernicke's area,*** an area in the left temporal lobe, controls language reception. Language functions are distributed across other brain areas as well. For example, different neural networks are activated by nouns and verbs, by different vowels, and so on. Thus, in processing language, as in other forms of information processing, the brain operates by dividing its mental functions, but your conscious experience seems indivisible.

►Lectures: The Vocabulary of Taste (p. 523); Think Before You Speak (p. 523); The Impact of Language on Thought (p. 524); New Words (p. 524)
►Exercises: Doublespeak (p. 525); Introducing Imagery Research (p. 527); Mental Imagery (p. 527); Creating a Mental Model (p. 529)
►Exercise/Critical Thinking Break: Verbal Information Can "Overshadow" Memory (p. 526)
►Project: Cognitive Maps (p. 528)
►Podcasts: Thought With(out) Language (Pods 1 and 2) (p. 526)

8-9. *Explain how thinking in images can be useful.*

We often think in images. In remembering how we do things, for example, turning on the water in the bathroom, we use a mental picture of how we do it. Imagining a physical activity triggers action in the same brain areas that are triggered when actually performing that activity. Researchers have found that thinking in images is especially useful for mentally practicing upcoming events and can actually increase our skills. Mental practice in achieving academic goals seems more effective when it focuses on plans for reaching the destination (*process simulation*) rather than on the imagined destination itself (*outcome simulation*).

►Worth Video Anthology: *Teaching Language to Chimpanzees; Animal Language*

8-10. *Describe what we know about other species' capacity for language.*

Animals display great powers of understanding and communicating. Vervet monkeys sound different alarm cries for different predators. Several teams of psychologists have taught various species of apes, including a number of chimpanzees, to communicate with humans by signing or by pushing buttons. Apes have developed considerable vocabularies. They string signs together to form sentences and have taught their skills to younger animals. Skeptics point out important differences between apes' and humans' facilities with language, especially in their respective abilities to master the verbal or signed expression of complex rules of grammar. Nevertheless, studies reveal that apes have considerable ability to think and communicate.

Intelligence

► Lectures: Twelve Interesting Facts About Intelligence (p. 549); Intelligence as the Capacity to Adapt (p. 550); Artificial Intelligence (p. 579)
► Exercise: The Factor Analysis Appoach (p. 550)
► Exercises/Projects: What Is Intelligence? (p. 549)
► Exercise/Podcasts: Computers, Robots, Machines: Simulating Intelligence and Other Human Traits (p. 581)

8-11. *Explain how psychologists define* intelligence, *and discuss the arguments for general intelligence (*g*).*

The meaning of ***intelligence*** varies across the globe. However, most psychologists now define intelligence as the ability to learn from experience, solve problems, and use knowledge to adapt to new situations.

Charles Spearman granted that people have specific abilities, such as verbal and mathematical aptitudes, but he believed that a ***general intelligence (g)*** factor runs through all our intelligent behavior. Spearman's position stemmed in part from *factor analysis,* a statistical tool that searches for clusters of related items.

► Lectures: Savant Syndrome (p. 551); Kim Peek's Brain (p. 553); Gardner's Theory of Multiple Intelligences (p. 553); Successful Intelligence (p. 555); The Psychology of Wisdom (p. 557)
► Exercises: Questionnaire for Business Management (p. 556); The Autism-Spectrum Quotient (p. 556); Sternberg's Balance Theory of Wisdom (p. 558)
► Feature Film: *Rain Man* and Savant Syndrome (p. 553)
► PsychSim 5: Get Smart (p. 550)

8-12. *Identify two theories of multiple intelligences, and discuss the criticisms they have faced.*

Evidence that brain damage may diminish one ability but not others, as well as studies of ***savant syndrome,*** led Howard Gardner to propose a theory of multiple intelligences. These include eight *relatively independent intelligences*—for example, the verbal and mathematical aptitudes assessed by standard tests. Four in five people with savant syndrome are males, and many also have *autism spectrum disorder* (ASD). Robert Sternberg proposes a *triarchic theory* of multiple intelligences in which he distinguishes among analytical (school smarts), practical (street smarts), and creative (trailblazing smarts) intelligences.

Critics of multiple intelligences theories contend that a weakness in one area isn't necessarily balanced by genius in some other area. Also, success requires a combination of ability and motivation. The *10-year rule* explains that successful people have all spent about a decade in intense, daily practice.

► Lectures: Myths About Emotional Intelligence (p. 562); Emotional Intelligence: An Ability or Collection of Eclectic Traits? (p. 562); Ego-Resiliency (p. 563); Fostering Children's Emotional Intelligence (p. 564); Intelligence, Self- Discipline, and Academic Performance (p. 565)
► Exercises: Ten Facets of Emotional Intelligence (p. 561); Emotional Intelligence Scale (p. 561); "Reading the Mind in the Eyes" Test: Sample Items (p. 562)

8-13. *Describe the four abilities that make up emotional intelligence.*

The four abilities of ***emotional intelligence,*** a critical part of *social intelligence,* are the ability (1) to *perceive* emotions (to recognize them in faces, music, and stories), (2) to *understand* emo- tions (to predict them and how they change and blend), (3) to *manage* emotions (to know how to express them in varied situations), and (4) to *use* emotions to enable adaptive or creative thinking. Those who are emotionally smart often succeed in careers, marriages, and parenting where other academically smarter (but emotionally less intelligent) people fail.

► Exercises: A World War I IQ Test (p. 566); Issues in Testing (p. 568)
► Project: Joining Mensa (p. 566)
► Exercise/Project: Designing and Administering an Intelligence Test (p. 566)

8-14. *Describe when and why intelligence tests were created, and discuss how today's tests differ from early intelligence tests.*

Psychologists define an ***intelligence test*** as a method for assessing an individual's mental aptitudes and comparing them with those of others, using numerical scores. Barely more than a century ago psychologists undertook to assess people's ***aptitude*** (ability to learn) as well as their ***achievement***. The modern intelligence-testing movement started when French psychologist Alfred Binet began assessing intellectual abilities. Together with Théodore Simon, Binet developed an intelligence test containing questions that assessed ***mental age*** and helped predict children's future progress in the Paris school system. The test sought to identify French schoolchildren needing special attention.

Lewis Terman of Stanford University adapted Binet's test as the ***Stanford-Binet;*** he had found that the Paris-developed age norms did not work well with California schoolchildren. William Stern derived the ***intelligence quotient,*** or ***IQ,*** for Terman's test. The IQ was simply a person's mental age divided by chronological age multiplied by 100. Today, we refer to intelligence test scores, which represent the test-taker's performance relative to the average performance (arbitrarily assigned a score of 100) of others the same age.

The ***Wechsler Adult Intelligence Test (WAIS),*** created by David Wechsler, is the most widely used intelligence test. It consists of 15 subtests and yields not only an overall intelligence score but also separate verbal comprehension, perceptual organization, working memory, and processing speed scores. Striking differences among these scores can provide clues to cognitive strengths or weaknesses that teachers or therapists might build upon.

► Exercises: Reliability and Validity (p. 570); Remote Associates Test (p. 570)
► Exercise/Project: Understanding Predictive Validity (p. 569)
► Exercise/Critical Thinking Break: Evaluating "Free" Intelligence Tests on the Internet (p. 567)

8-15. *Describe the normal curve, and explain what it means to say that a test has been standardized and is reliable and valid.*

Because scores become meaningful only when they can be compared with others' performance, they must be defined relative to a pretested group, a process called ***standardization***. Obviously, the group on which a test is standardized must be representative of those who will be taking the test in the future. Standardized test results typically form a normal distribution, a bell-shaped pattern of scores that forms the ***normal curve***. Most scores cluster around average, and increasingly fewer are distributed at the extremes.

Reliability refers to the extent to which a test yields consistent scores. Consistency may be assessed by comparing scores on two halves of the test or on retesting. A test can be reliable but not valid.

Validity refers to the extent to which a test measures or predicts what it is supposed to. Valid tests have *content validity* when they measure what they are supposed to measure. To some extent, intelligence tests do have *predictive validity:* They can predict future performance.

8-16. *Describe the traits of those at the low and high intelligence extremes.*

At one extreme of the normal distribution are people whose intelligence scores fall below 70. To be labeled as having an ***intellectual disability*** (formerly referred to as *mental retardation*), a child must have both a low test score and difficulty adapting to life demands. Intellectual disability sometimes results from known physical causes, such as ***Down syndrome,*** a disorder of varying severity that is attributed to an extra copy of chromosome 21.

At the other extreme are the "gifted." Research by Lewis Terman suggests that high-scoring children are healthy, well adjusted, and academically successful. More recent research confirms that these "whiz kids" outperform their more average peers.

► Lectures: Genes and Intelligence (p. 574); Misunderstanding Heritability
► Exercise: Incremental Versus Entity Theories of Intelligence (p. 573)

8-17. *Discuss how intelligence is influenced by nature and nurture, and explain what we mean when we say that a trait is heritable.*

Studies of twins, family members, and adopted children together point to a significant genetic contribution to intelligence scores. For example, the test scores of identical twins reared separately are nearly the same. Furthermore, the most genetically similar people have the most similar scores, ranging from +.85 for identical twins raised together to about +.33 for unrelated individuals raised together (indicating that shared environment also matters). ***Heritability*** refers to the extent to which differences among people are attributable to genes. To say that the heritability of intelligence is 50 percent does not mean that half of an individual's intelligence is inherited. Rather, it means that we can attribute to heredity 50 percent of the variation of intelligence among those studied. Mental similarities between adopted children and their adoptive families wane with age, until the correlation approaches zero by adulthood. Intelligence appears to involve many genes, with each gene accounting for much less than 1 percent of intelligence variations.

Studies of children reared in extremely neglectful or enriched environments also indicate that life experiences significantly influence intelligence test scores. However, although extreme deprivation can retard normal development, there is no environmental recipe for creating a genius out of a normal infant.

8-18. *Discuss the stability of intelligence scores across people's lives, and describe how psychologists study this issue.*

Intelligence endures. By age 4, children's intelligence test scores begin to predict their adolescent and adult scores. By late adolescence, intelligence and other aptitude scores display remarkable stability. Developmental psychologists use ***longitudinal studies*** (restudying the same group at different times across their life span) and ***cross-sectional studies*** (comparing members of different age groups at the same time) to study the way intelligence and other traits change with age.

► Lectures: Reaction Time, Intelligence, and Longevity (p. 565); Why Do Intelligent People Fail? (p. 571); Are Intelligent People Happier? (p. 572); Giftedness (p. 572); Achievement in Later Life (p. 573)

8-19. *Define* crystallized *and* fluid intelligence, *and describe how they are affected by aging.*

Crystallized intelligence—our accumulated knowledge, increases up to old age. ***Fluid intelligence***—our ability to reason speedily and abstractly—ddeclines gradually until about age 75, and then, especially after age 85, decreases more rapidly.

These life-span differences in mental abilities help explain why older adults are less likely to embrace new technologies. These differences also help explain why mathematicians and scientists produce much of their most creative work during their late twenties or early thirties, when fluid intelligence is at its peak. In contrast, people working in literature, history, and philosophy tend to produce their best work in their forties, fifties, and beyond.

8-20. *Describe how and why the genders differ in mental ability scores.*

Although gender similarities far outnumber gender differences, we find the differences in abilities more interesting. Research indicates that, compared with boys, girls are better spellers, are more verbally fluent, are better at locating objects, and are more sensitive to touch, taste, and color. Boys outnumber girls at both the low extremes and the high extremes, and have a strong edge in spatial ability and complex math problems. In math and science, social expectations and opportunities also matter. Females detect emotions more easily than do males.

► Lectures: Environmental Explanation of Group Differences (p. 577); Intelligence as Culturally Defined (p. 577); The SAT® Reasoning Test: A Case Study in Testing
► Exercises: Blacks as a "Castelike" Minority (p. 576); Culture-Biased and Culture-Fair Tests (p 577)

8-21. *Describe how and why racial and ethnic groups differ in mental ability scores.*

White Americans have outscored Black Americans on intelligence tests. European New Zealanders outscore native Maori New Zealanders, Israeli Jews outscore Israeli Arabs, and most Japanese outscore the stigmatized Japanese minority. Research suggests that environmental differences are largely responsible for these group differences. Consider: (1) Genetics research indicates that the races are remarkably alike under the skin; (2) race is not a neatly defined biological category; (3) intelligence test performance of today's better-fed, better-educated, and more test-prepared population exceeds that of the 1930s population by the same margin that the score of the average White today exceeds that of the average Black; (4) given the same information, Whites and Blacks show similar information-processing skills; (5) Asian students outperform North American students on math achievement and aptitude tests; and (6) in different eras, different ethnic groups have experienced periods of remarkable achievement.

8-22. *Discuss whether intelligence tests are biased and discriminatory.*

Intelligence tests are "biased" in the sense that they are sensitive to performance differences caused by cultural experience. However, tests are not biased in that they predict as accurately for one group as they do for another. For example, the predictive validity is roughly the same for women and men, for various races, and for rich and poor. ***Stereotype threat*** is a self-confirming concern that one will be evaluated based on a negative stereotype. The phenomenon sometimes appears in intelligence testing among Blacks and among women.

HANDOUT 8-1

Fact or Falsehood?

T F 1. In general, people underestimate how much they really know.

T F 2. It takes less compelling evidence to change our beliefs than it did to create them in the first place.

T F 3. Research suggests that a common ingredient of expert performance in chess, dancing, sports, and music is about a decade of intense daily practice.

T F 4. The babbling of an infant at 4 months of age makes it clear whether the infant is French, Korean, or Ethiopian.

T F 5. Deaf children who learn sign language as teens are never as fluent as native signers.

T F 6. Imagining a physical activity triggers action in the same brain areas that are triggered when actually performing that activity.

T F 7. Only human beings seem capable of insight (the sudden realization of a problem's solution).

T F 8. Apes are capable of communicating meaning by using symbols.

T F 9. The concern with individual differences in intelligence is strictly a twentieth-century American phenomenon.

T F 10. As adopted children grow older, their intelligence scores become more similar to those of their biological parents than to those of their adoptive parents.