Teaching to Change the World

Chapter 2: Traditional Learning Theories: Transmission, Training, and IQ

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Library of Congress Cataloging-in-Publication Data

Oakes, Jeannie.
Teaching to change the world / Jeannie Oakes, Martin Lipton. — 1st ed.
p. cm.
Includes bibliographical references and index.
ISBN 0-07-109381-8
LA217.2.025 1999 371.010973—dc21
98-36582 CIP

www.mhhe.com/socscience/education/
Family in the Postmodern World” in Kappan (1997), credits these events with ending an era that has been so marked by faith in humans to create and use knowledge and reason for progress and the betterment of all humankind.


25. Ibid., p. 730.


Prior to the first day of school, I had already been told that "these kids are slow," and not to worry if the students did not do as well as I hoped because "the entire school is slow overall."

—Rosalinda Perez Silva
First-year teacher, grade 1

Rosalinda Silva, who teaches a class of twenty 6- and 7-year-olds in a Spanish-speakiMng immigrant neighborhood, says that her young students are "brilliantly intelligent," but "already struggling." A casual observer might see only that they are struggling with school. But at least part of their struggle is to overcome the judgments teachers have already made about them. Those judgments are not uncommon.

The Bell Curve: Debates Rage About Intelligence and Learning

In 1994, just two months after its publication, The Bell Curve: Intelligence and Class Structure in American Life had 400,000 copies in print. Richard Herrnstein and Charles Murray's best-selling book claimed to offer scientific proof that African Americans inherit lower IQs than white Americans and that these IQ differences are virtually impossible to change. Put bluntly, Herrnstein and Murray state that the average African American is less well educated and less healthy than the average white because he or she is not born with the capacity to be smart. Therefore, the authors also claim, social programs that attempt to close opportunity gaps—programs such as Head Start, compensatory education, and affirmative action—are costly and useless. They argue that (1) the programs hurt those people they are intended to help by steering them away from the lower-level aspirations and occupations that suit their abilities and (2) such programs harm society because they give less intelligent people access to social positions that require greater aptitude. The authors, well-known academics from prestigious universities, bolstered these claims with impressive-looking charts, graphs, and statistics in their 800-plus-page book.

One Side: Some Children Simply Aren't Smart Enough

The Bell Curve has profound implications for schools and teaching. It argues that Americans need to face the reality that "in a universal education system, many students will not reach the level of education that most people view as basic." Moreover, according to the authors, efforts to teach groups of children with low IQs (disproportionately, disadvantaged children of color) more than the most modest skills will benefit neither those children nor society. Rather, government and educators should shift most of their teaching resources and efforts from the disadvantaged to the intellectually gifted.

Readers of The Bell Curve and of the countless magazine and journal reviews that followed its publication, as well as listeners to TV talk shows and radio call-in programs about the book, were frightened and enraged. Those who liked the book were angry because it confirmed their political views about the futility (or worse) of social programs that aimed at improving the life chances of Americans of color. People who disagreed were furious because they found the book dishonest, unscientific, and morally offensive.

A book such as The Bell Curve appears every few decades or oftener. In 1969, Harvard psychologist Arthur Jensen argued that because national poverty programs did not appreciably raise children's IQs, it must be that children of the poor are genetically intellectually inferior. Physicist William Shockley reemerged years after co-inventing the transistor to bring the authority of his scientific credentials to a proposal for reimbursing voluntarily sterilized individuals according to their number of IQ points below 100. What is notable here is the instant popularity of such views. The findings in these reports made front-page headlines, and they gave eager readers permission to speak aloud their previously private convictions about race and the poor.

Even the most fair-minded teachers did not realize the extent to which The Bell Curve's old-fashioned, inaccurate (at best), and racist perspectives were present in the minds and hearts of their fellow Americans, including many of their colleagues at school. Respected scholars instantly refuted the books and reports, but they were consigned to smaller pieces on the editorial pages and to magazines and journals with smaller audiences than television or newspapers.

The Other Side: All Children Are Smart Enough, But Schools Aren't

Other books by distinguished scholars, many in recent years, tell a much different story about learning and intelligence. Stephen J. Gould, who teaches the history of science at Harvard, details the scientific and statistical flaws of intelligence testing and traces the links between IQ, bigotry, and oppression in his richly documented history The Mismeasure of Man. Howard Gardner and David Perkins, both at Harvard's education school, also dispute The Bell Curve. They offer evidence that the kind of intelligence that IQ represents pales in importance compared with other, more reflective mental processes. In Frames of Mind, Gardner argues that people are intelligent in many different ways, and in Outsmarting IQ, Perkins contends that the most important mental processes are learned, not inherited.

Jerome Bruner's Acts of Meaning and Culture and Education are just two of many recent books that draw from research in anthropology, linguistics, and psychology to show that learning is a social and cultural process. This sociocultural view, discussed more fully in Chapter 3, departs dramatically from views expounded in The Bell Curve. According to Bruner and many other scholars, learning takes place within the whole person's experience in society, not just inside the head; and learning is constructed and shaped through relationships, not determined by inherited aptitudes. That is, people learn as they interact with others to make sense out of the world and their experiences in it, and intelligence
develops as people learn and grow. Because different cultures provide children with different learning situations, and because they value the mastery of different tasks, differences among groups of people in "native intelligence"—a much disputed concept—explains little about what they can and do learn.

That children can learn to be smart in school represents a dramatic shift from older views and is an idea gaining in popularity in schools' rhetoric. However, this perspective is too easily interpreted to mean that different children need dramatically different treatments in school because some get smarter faster. Given schools' legacy of scientific management, the temptation is great to judge how smart students are at a particular moment and to rank and sort them accordingly. These judgments soon trap educators into seeing intelligence as placing a ceiling on what students can learn. A fairer and more accurate view is for teachers and school policies to acknowledge that all students are smart, as opposed to capable of being smart. They may not be smart about the same things in the same language. They may be smart about many things that others, especially adults, disapprove of or do not understand. But to respect the mental powers of students, teachers do not need to look at students' potential or their theoretical ability to reach the school's idea of what it means to be smart. Students are smart. They are smart now.

The views in books such as Perkins's and Bruner's are supported by far more reliable evidence from distinguished scholars and credible reviewers than are Murray and Herrnstein's arguments. But, typically, perspectives such as those of Perkins and Bruner do not make headlines, lacking the flashy claims that people's genes cause inequality or that buying off the less intelligent can purify the human race.

Theories and Debates Drive Practice

The debates about learning and intelligence are more than intellectual disagreements among psychologists. Every school organization and teaching act is based on some theory—well founded or not—of how and why it will work well for students. This chapter looks at the theories of learning and intelligence that are embedded in The Bell Curve and, sadly, are alive and well in today's schools. Even this brief overview makes clear that theories about learning are not neutral and objective scientific discoveries. Rather, they reflect salient beliefs and values of the times and of the Western and American cultures in which they develop. Typically, the theories that gain acceptance serve the interests of powerful people of the period.

Part of teachers' professional knowledge includes their ability to recognize, articulate, and weigh the theories that underlie their own and others' practice. Many new teachers will begin their careers in schools and communities where older, traditional theories still prevail. Understanding the historical, cultural, and political contexts of conflicting theories about learning helps explain why many people find traditional theories so appealing. It also sheds light on why some people resist newer, competing theories that support all students learning well. The next (more encouraging) chapter explores the newer, sociocultural conceptions of learning and intelligence. Teachers committed to teaching for social justice can use these theories with confidence to guide their practice in diverse American schools.

Changing Conceptions of Learning

Although intelligence, learning, development, and psychology are distinctly different concepts, they are very closely associated, both historically and in common practice. In this chapter and elsewhere, learning refers to the processes and mental structures by which people accumulate experiences and make them into new meanings. The key is that learning theories attempt to explain a "process." Intelligence refers to mental power. The key to intelligence theories and measurements is that they try to determine "differences" among people; that is, no one is simply intelligent, he or she must be more or less intelligent than some comparison individual or group. Development refers to the relatively orderly changes everyone experiences throughout their lives. Theories of development attempt to explain how these changes take place. Most consider development to be a progression from one distinctly different stage to the next, rather than changes that are smooth and gradual. Although these changes are unique for each individual, there are certain consistent patterns of maturation, and social, personal, physical, and cognitive (mental or thinking) development.

Psychology is that field which investigates the mind and mental processes, and out of which come the most dominant understandings of the learning process. In many respects, over the last hundred years of so, the most powerful science and the most damaging misinformation have come from this field. However, while the science of psychology is relatively young, theories of learning have been around for a very long time. Before psychologists, theologians and philosophers explained the nature of knowledge and how humans came to know it.

One enduring controversy—debated long before the birth of psychology—is the degree to which nature and/or nurture best explains an individual's learning, intelligence, and development. Nature refers both to the particular genetic inheritance individuals receive from parents and to the general mental capacities held in common by the whole human species. Nurture refers to an individual's environment—essentially all that a person experiences after conception (environmental conditions in the womb may influence a person's development). Today, virtually everyone agrees that both biological inheritance (nature) and experiences (nurture) are very important and cannot be separated. But just as in the distant past, debates rage over which matters most in learning, intelligence, and development.

The Enlightenment: Reason for Thinking

The European Renaissance from roughly the fourteenth to the seventeenth century marked a transition from medieval to modern thought—from people as subjects in God's world to people as worthy of investigation in their own right.

Easing into the modern era, philosophers began to seek answers to...
Sans other than the authority of scripture. Although they did not discount
the seventeenth- and eighteenth-century Enlightenment thinkers did take
ack of the Renaissance achievements in architecture and art, mathematics,
immerce, cities and government, and more. They asked what it was about
humans that allowed those achievements, what the source of knowledge was
that made the achievements possible. In a more technical sense, they pondered
processes that humans use to make knowledge.

Assuming that humans “make knowledge” is a particular and significant
point of view. The prevailing alternative was, and often remains, that humans
not make knowledge—that knowledge is there (out there in the world or in
here in the mind) already, waiting to be known. If scripture could not provide
the large answers or the smallest details to these questions, what could?
Enlightenment scholars concluded that reason, an inborn human capacity, is
partly responsible for humans turning experiences into certain types or cat-
egories of knowledge.

The giants of Enlightenment philosophy—Rene Descartes (1596–1650),
ohn Locke (1632–1704), Immanuel Kant (1724–1804), and others—proposed
many of the perplexing questions at the heart of twentieth-century psychology:

Are some forms of knowledge inborn or innate?

What truths can be known through reflection, or examining our own
thoughts?

Is there a mind or soul that is spiritual or separate from the physical body?
If so, do they interact?

What is the difference between physical sensations and ideas?

How do smaller bits of experience (I feel cold) turn into broad abstractions
(Is it better to conserve energy, or should I turn on the heater and maybe
avoid the stiff neck I get from the tension)?

How do we study something (like the mind) that we can’t see?

How can we be scientific if we cannot distinguish between what we are
really studying and all the other junk that may have nothing to do with what
we are studying? (What causes rain? It happens every time I wash my car.)

Each of these Enlightenment thinkers came to somewhat different answers—
answers that have influenced the direction of our ideas about human thinking
and learning ever since. Descartes, who emphasized the mind as a region sep-
parate from the body that inspects ideas, argued that some forms of knowledge
were inborn, and that the mind’s reasoning was the most reliable source of
that knowledge; he doubted the certainty—the reliability—of bodily sensations.
Kant, in contrast, questioned the concept of innate ideas and turned to “empiri-
cal” evidence for knowledge—the reality that can be detected by the senses.
He kept Descartes’s notion of a mind but argued that the mind is a blank slate
that only is written on through experience. Kant saw the mind as an organ that,
rather than blankly awaiting experience, was equipped with processes that

created orderly thought and understanding. The mind mediated, categorized,
and represented the sensations and ideas, making sense out of more chaotic,
more concrete experience. For Kant, the outside world was not irrelevant to think-
ing, as it was to Descartes, because it provides the raw material that the mind
organizes. Today’s various perspectives on learning and teaching have deep
roots in the past and draw their logic from these earlier modes of thinking.

Interestingly, one concept that did not seem to trouble Enlightenment
philosophers was individual differences in intelligence. On one hand, they cer-
tainly took note of the differences in people’s social status, and they could not
help but notice that some people performed their life’s work with more or less
skill or brilliance. On the other hand, their main task was to discover the mean-
ing and the nature of knowledge. They had many other cultural ways to figure
out who was worthy, who had merit.

Although most nineteenth-century teachers had little or no training in how
to teach, metaphors drawn from the work of Descartes, Locke, Kant, and other
Enlightenment thinkers helped people “understand” the mystery of learning
and helped shape classroom instruction. These metaphors portrayed young
minds as “empty vessels” to be filled or as “blank slates” to be written on. Some
educators used these ideas to develop “methods” for teaching. German edu-
cator Johann Herbart (1776–1841), for example, combined Enlightenment ideas
of reason with the growing faith in systematic approaches, planning, and organ-
ization. He developed and popularized a design for classroom lessons that
promised to bring order to instruction and standardization among classrooms.
The Herbartian lesson plan included five steps: (1) Remind students of knowl-
edge already learned; (2) present new material; (3) compare new material to
prior knowledge; (4) generalize a central idea; and (5) apply the new knowl.
edge to some other situation. These steps organized common teaching practices
of the time into a rational, efficient, and easily monitored method of instruction.

More important than the organization (steps) themselves, Herbart introduced
many to the idea that teaching could be a highly orderly process.

Others took the ideas of Enlightenment thinkers. Locke, in particular, to
mean that young children should learn from contact with real objects, investi-
gating for themselves rather than being given verbal instruction. Maria Montes-
sori, for example, combined hands-on investigation and a more nurturing,
maternal approach to teaching (one accompanying the increased presence of
schoolmarm) to create an early forerunner of twentieth-century progressive
education—especially for the very young.

Most teachers, though, stuck with traditional methods for transmitting
knowledge. Children spent their time memorizing, reciting, and reproducing
their lessons to demonstrate that they had acquired knowledge. Some older
people today may recall school days filled with copying long texts verbatim;
memorizing poems, famous speeches, and Shakespearean dialogue; conjugating
Latin verbs; and the class being called upon by the teacher to recite the lesson as
a group. Their vessels (note the metaphors for foolishness: “empty-headed,”
“airheaded”) were being filled with knowledge, and their slates were being written
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Learning Theories: Transmission, Training, 

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and imagination.'"

The ineteenth Century: From Reason to a

Science of Psychology

The nineteenth century also brought some early scientific psychological studies—
a curious mix of crackpot invention alongside more mature study of learning and
intelligence. Phrenology, for example, represented an attempt to apply to practi-
cal use an early version of psychological theory. Yes, some believed that they
could feel the bumps on one's skull and know something about that person's
mental faculties and character traits. But Franz Gall, a noted nineteenth-century
phrenologist (a practitioner of bump analysis), combined his non-sense with a
systematic study of anatomy. Other investigators studied the brain and brain
functions—sometimes correctly identifying parts of the brain that had specific
functions such as speech or sight.

What is most significant about these studies is that they signaled the begin-
ing of the scientific study of behavior and, eventually, learning. No longer lim-
ited to thought scenarios, general scholarship, and study of the classics, scholars
were becoming systematic in their observations, recording their findings, and
building on, or refuting, the work of other observers. Furthermore, psychologists
began to look at the general characteristics of mind and behavior that all mem-
bers of the species hold in common. Throughout the 1800s, enthusiasm mounted
about the prospect of knowing with precision a person's mental and behavioral
characteristics. Might scientists predict who was a person of compassion, a mur-
derer, crazy, intelligent? Could there be certainty about how people come to
know (learning), and could they compare their knowledge and reasoning to oth-
ers (intelligence)? It would still be some time before these theories would become
relevant for schools.

By the middle of the nineteenth century, Charles Darwin (1809—1882) had
argued that intelligence transmitted by inheritance was central to human evo-
u tion; that is, as the human species, through natural selection, favored its most
intelligent members, humans became increasingly distinct from apes. His
nephew, Sir Francis Galton (1822—1911), used Darwin's notions to study the
importance of intelligence in modern times. He gathered data about the British
royal family to show that intellectual capacity runs in families. He also de-
veloped tests of sight, hearing, reaction time, and sensitivity to touch to measure
intelligence. These were empirical studies—that is, they relied less on subjective
judgments and more on objectively recorded observations. Empirical studies
are likely to produce consistent data when experiments are repeated by differ-
ent observers. Galton's pursuit of a measurement that would capture inherited
abilities sparked a search that dominated much of psychology in the first
decades of twentieth century.

The Promise of Scientific Schooling

Events of the late nineteenth century brought the first hints that the science of
psychology could provide practical benefits to schooling. In spite of the hor-
rendous social problems and inequality that accompanied industrialization,
mass production, and urbanization—not the least of which was the challenge
to educate so many from so many different places—Americans at the turn of
the twentieth century were optimistic, believing the nation could overcome any
harsh conditions that might eventually threaten social stability. After all, there
was the myth, and for many the reality, of personal and public improvement,
advancement, and progress. Further, new technological accomplishments were
in evidence every day. If there was a problem worth fixing, then surely Amer-

G. Stanley Hall (1844—1924) used his pioneering theories and studies of child
development to press for a more scientific approach to teaching. Founder of the
"child study movement" at the end of the nineteenth century, Hall's research led
him to argue that each stage of children's development mirrors that of social
development. For example, Hall likened ages 4 to 8 to the hunting and gathering
period of human history, and he saw ages 11 and 12 as paralleling barbarian life.
Puberty brought a romantic stage of life when youthful passions could either be
marshaled for the good of society or allowed to degenerate. For Hall, this ado-
lescent stage represented either society's bright future or its demise.

Hall's stages are rooted in the naturalistic views of philosopher Jean-Jacques
Rousseau (1712—1778), who believed in the inherent (natural) goodness and high
potential of children—goodness and potential that must be protected from a cor-
rupting society, especially from the babbling talk and teaching that keep the
young from direct experience with the concrete world. Rousseau believed that,
if left uncorrupted, children would develop naturally into the best possible
adults. This idea of development in stages, during which children change in
their deep and fundamental nature, gave Hall his greatest influence in educa-
tion, although his specific logic and description of the stages did not last long.
In particular, Hall provided the foundation for the idea of adolescence—a time
of life when children had markedly different needs and required distinctive
treatments in school. The invention of the junior high school as a separate insti-
tution with curriculum and instruction designed to match the young adoles-
cent's developmental needs and interests followed directly from Hall's science.
Intelligence, Learning, and Merit: You Get What You Deserve

Historically, Western societies distributed wealth and privilege according to how close one was to an elite or ruling class. Prior to the surge of democratic thinking in the seventeenth century, royalty, church leadership, landowners, and wealthy merchants managed to have more wealth and privilege than artisans, peasants, and slaves. Not everyone thought it was fair, but few with power apologized or felt they had to justify it.

A central dilemma of modern and more egalitarian societies is how to explain disparities in wealth and privilege. Americans have always been disdainful of aristocracy, of publicly acknowledged ruling classes, and of social power as a birthright. Instead, the idea of merit, discussed in Chapter 1, substitutes for inherited privilege. Merit, which provides moral legitimacy to what might otherwise appear as unfair or undemocratic, explains why some citizens and their children are so well off generation after generation.

Who Is Deserving?

An early way to explain why some Americans had greater wealth—one that is still with us to some degree—was based on Calvinist and Puritan religious ideas. According to these views, those favored by God were prosperous and those not favored had less. Conversely, being poor was a sign of not being favored by God. Another explanation important from the earliest days was that hard work and ambition determined who deserves wealth and social advantage. Again, the unsuccessful could be seen as having less of these qualities. Additionally, although aristocracy and parentage were not useful ways to make sense out of significant social class differences, many other largely unquestioned group characteristics were indeed useful. It was obvious, with little explanation required, that racial minorities, immigrants, women, persons from rural areas, and others had no moral standing on which to base complaints against their social or economic status.

But over time, and slowly at first, the obvious would be challenged. In the late nineteenth century, scientists began the systematic study of intelligence as they sought to develop more rational and scientific explanations to explain and justify the social class differences between racial and other groups. They gave intelligence a home: the brain. It had origins: heredity. It had an amount measured in terms of IQ: a person could have 110 of it or 78 of it, and people and groups could on average possess more or less. They traced the lesser merit of the poor and of "other" races to their smaller brains, nefarious eyes, recent descendancy from apes, parents who were Eastern or Southern European, or religion. For many, grounding merit in the concepts of intelligence and achievement—measured by scientifically developed standardized tests—was attractive because it did not upset the prevailing distribution of wealth and privilege. In addition, intelligence testing demonstrated that though all might benefit from mental exercise, the mental muscles of some were inherently too weak for rigorous intellectual effort. Thus, within a few decades, Americans had accepted new definitions of learning and merit. Psychometrics—the measurement of mental traits, abilities, and processes—was applied quickly and widely throughout the country.

A Science of Intelligence

At the end of the nineteenth century, the American school population swelled. In 1890, only 10 percent of young people pursued schooling beyond the basic primary years. But by 1920, that percentage had nearly quadrupled. France, too, had instituted mass education. French schools, like American ones, continued to educate children from prosperous families who learned easily; at the same time, they began struggling to teach children from families who had never attended school and who seemed unable to learn or behave. At the request of the French government, French psychologist Alfred Binet (1857-1911) devised a test to help schools select those students who might benefit from greater help and attention in school—thus increasing their chances of succeeding in school. Binet's test included a range of questions designed for different-aged children. An 8-year-old who could pass most of the questions designed for a 12-year-old was said to have a mental age of 12. The reverse was true as well—a 12-year-old could have a mental age of 8, thus indicating a child who required special help. Binet cautioned that the test was strictly a screening device, not for use with "normal" children or to be applied broadly in schools.

Motivated less by sentiments of fairness than by needs for greater efficiency and social organization, Americans imported Alfred Binet's intelligence test. Within a few years, the field of psychology had made intelligence the cornerstone of a new scientific respectability. And, despite Binet's admonitions, educators had worked intelligence testing into the very structure and ideology of American schools. Many refinements of Binet's original tests followed, each one giving the test more power in the minds of the test givers and more power over the test takers. A significant change was to report the "result" (e.g., a 5-, 6-, or 7-year-old mental age) as a ratio of mental age to chronological age (actual age in years). Thus, a 6-year-old who scored a mental age of 4 received a score that was the quotient of 4 over 6, or a 67 intelligence quotient (after getting rid of the decimal). A 4-year-old with a mental age of 6 would have an IQ of 150. Of course, the test results did not really say anything more about a child than how many questions he or she could answer relative to other children of the same age. However, the convenient shorthand created the impression that IQ captured the essence of the child's prospects for school achievement, occupational fitness, and adult success.

Intelligence: The Clean Prejudice Binet's test, however, would not remain a neutral device to identify a small population of students. The test immediately linked progress-minded, scientific authority to existing social power and
rejudices. At the center of this process were men of high regard in the world of science. Their views and work employed statistical analyses along with novel, often twisted, interpretations of the evolution theories of Charles Darwin (1809-1882) and the heredity theories of Gregor Mendel (1822-1884), profoundly influential nineteenth-century scientists. H. H. Goddard (1866–97), Lewis Terman (1877–1956), Charles Spearman (1863–1945), and others, long with the society they influenced, believed that science could fashion from theories of evolution and heredity a progressively precise and scientific theory of eugenics. Eugenics was the use of selective breeding, including who should not be allowed to breed, in order to improve the mental and moral qualities of the human race.

**Intelligence Is Inherited: H. H. Goddard**

Prior to World War I, psychologist H. H. Goddard used a version of Binet’s tests on youngsters in a large New Jersey mental institution, as well as on their relatives, to explore whether “feeblemindedness” ran in families. His work was responsible for popularizing Binet’s ideas in the United States. But Goddard went much further than Binet, by applying Mendel’s ideas of biological inheritance to intelligence. Binet’s scale provided Goddard a single number to represent how much intelligence a person inherited. Goddard concluded that the poor and criminals had low intelligence—a trait they passed on to their children:

“...Our thesis is that the chief determiner of human conduct is a unitary mental process which we call intelligence: that this process is conditioned by a nervous mechanism which is inborn: that the degree of efficiency to be attained by that nervous mechanism and the consequent grade of intellectual or mental level for each individual is determined by the kind of chromosomes that come together with the union of the germ cells: that it is but little affected by any later influences except such serious accidents as may destroy part of the mechanism.

“How can there be such a thing as social equality with this wide range of mental capacity?”

**Low-IQ Children Are Mostly Non-Anglo and Poor: Lewis Terman**

Terman, a professor at Stanford University, developed and promoted intelligence tests for U.S. schoolchildren. Although Terman purported that his Stanford-Binet IQ tests measured innate abilities, the following items taken from one section of his test make clear that children from educated, culturally mainstream families were more likely to earn high IQs:

4. Most exports go from Boston San Francisco New Orleans New York
9. Larceny is a term used in Medicine Theology Law Pedagogy
16. A character in David Copperfield is Sinbad Uriah Heep Rebecca Hamlet

Because children from nonwhite and poor families scored lower than more socially advantaged ones, Terman used his IQ test results to confirm his view that heredity determined intelligence. He also used them to support his advocacy of low-level schooling for those who tested poorly as well as population control among the feebleminded. After testing a group of boys who lived in an orphanage, Terman wrote:

“The tests have told the truth. These boys are ineducable beyond the merest rudiments of training. No amount of school instruction will ever make them intelligent voters or capable citizens... Their dullness seems to be racial, or at least inherent in the family stocks from which they came... IQs meet this type with such extraordinary frequency among Indians, Mexicans and Negroes... Children of this group should be segregated in special classes and be given instruction which is concrete and practical... There is no possibility at present of convincing society that they should not be allowed to reproduce, although from a eugenic point of view they constitute a grave problem because of their unusually prolific breeding.”

Although IQ tests were periodically modified after the 1920s, they would continue to support views similar to Terman’s.

**IQ Predicts Almost Everything: Charles Spearman**

Spearman, an English military engineer before he was a psychologist, tested schoolchildren with a wide variety of measures to determine whether people who were good at one thing tended also to be good at others. Through statistical analysis of the results of the tests of different abilities, Spearman inferred an entity that he called g, for general intelligence. He conceived of g as a kind of inherited energy or power within the brain that activated other entities he called s, which referred to more specific abilities for which one could be trained. Without going through Spearman’s inventive statistical methods, suffice it to say he made a big mistake, Stephen J. Gould, who does explain the methods very well, calls Spearman’s g “the theory of intelligence as a unitary, rankable, genetically based and minimally alterable thing in the head.” He also calls it “a bankrupt theory.”

According to Spearman, in 1927:

“The general conclusion emphasized by nearly every investigator is that as regards ‘intelligence’ the Germanic stock has on the average a marked advantage over the South European. And this result would seem to have had vitally important practical consequences in shaping the recent stringent American laws as to admission of immigrants.”

As this brief account makes clear, the twentieth-century Western world invented a peculiar way of thinking about a person’s capacity for learning. This thinking gave psychologists, schools, the military, and even parents an instrument that could easily determine and communicate how smart a person was. Especially important, the tests appeared to be scientific and fair: The same tests were administered under the same conditions, with impartial mathematical
Traditional Learning Theories: Transmission, Training, and IQ

Soon educators and the public had a way to measure any student's capacity for thinking and learning, and this capacity represented an upper limit, a ceiling, on how clever or successful a student might become. Schools and society even adopted a construct called "overachiever" to explain the exceptional and rare occasion of when a student's performance exceeds his potential. (Note the expression "fulfilling one's potential!") Because potential is established with intelligence tests, it too is commonly understood as an unchangeable human attribute.

Readiness, Aptitude, and Ability: IQ in New Guises

In recent years, IQ tests have justly fallen into disfavor. They are used more carefully now than in the past, but not before they spawned several variations of themselves—variations that are not quite the same as IQ tests, but not very different either. IQ tests are standardized and norm-referenced, characteristics that refer to the statistical procedures that give IQ tests their scientific validity, reliability, and credibility. The same statistical features characterize the many IQ " wanna-bes," with their pervasive educational and social influence.

Tests such as the Scholastic Aptitude Test (SAT), and many tests of "basic skills," have some questions that are closely aligned with schools, but like IQ tests, they measure very general knowledge and skills. The SAT argues that studying for the test is not worthwhile because the test measures a general human quality, not specific subject knowledge. In short, as an aptitude test, the SAT claims to predict future school success but does not claim to measure accurately what students have learned in school. The following SAT "mathematical reasoning" question is an example of the blending of school knowledge (math), reading ability (with a focus on vocabulary), cultural knowledge (familiarity with playing cards, and perhaps prior experience solving problems for no practical reason), and reasoning:

"Seven cards in a pile are numbered 1 through 7. One card is drawn. The units digit of the sum of the numbers on the remaining cards is 7. What is the number of the drawn card?" (The choices are numbers 1, 3, 5, 6, or 7.)

Other tests that have important reading comprehension components, such as the CTBS and the Iowa Test of Basic Skills, measure very similar skills as the SAT. In fact, since scores on reading comprehension tests typically correlate strongly with scores on IQ tests, the reading tests are often used to substitute for IQ tests. In other words, a high reading score is taken to mean high general ability—just as a high score on an IQ test is taken to mean high intelligence. This includes kindergarten reading readiness or prereading tests. So, although most students today are unlikely to be tested for IQ, their schools will have something very similar by which to judge them.

These tests owe their great social acceptance and influence—that is, their compatibility with cultural views of merit, efficiency, and competition—to their statistical (scientific) methods. Like IQ tests, all these tests are norm referenced; that is, scores on the test have meaning only in comparison to the scores of others who took the test. So, for example, a 500 on the SAT is an average score that
like 100 on an IQ test. It doesn’t tell what a person knows but, rather, where he or she stands in comparison with others. The tests are constructed so that most people score in the average range, with fewer getting scores above and below average, and even fewer at the two extremes. This is why the scores on these tests form a bell curve. The large number of average scores form the highest point of the bell, and fewer number of extremely high and low scores flatten out the curve on either side.

In cultures with fixed social hierarchies such as class, race, gender, and so on, these categories are used as legitimate ways to determine who has merit. If, at a glance, people can legitimately judge others’ merit, there is less need to compare people (since there can be no dispute about who would receive rewards or social privileges). However, an egalitarian and democratic society frowns on such categories and cannot tolerate categories that are permanent. Thus, in the United States, intelligence has become a substitute for less acceptable indicators of merit. Hiding behind the intelligence/merit connection and the technicalities of testing then makes it easier to confer benefits on individuals because of their measured, or assumed, higher intelligence (in the United States, this has typically been white middle- and upper-class males).

Learning as Behavioral Training

Much early psychology was a blend of folk wisdom, philosophy, anthropology, introspection, and biological science. Trying to rise above this ill-formed anarchy, psychologists in the early years of the twentieth century strove mightily to bring order and respectability to their discipline. In brief, they wanted a “scientific” field of study.

Laboratories and Psychometrics:
The Trappings of Science

Much of the psychology in the first half of the twentieth century followed two traditional lines of scientific inquiry: (1) laboratory experiments with animals, which often investigated response times and other physiological responses (blood pressure, respiration, eye blinks, etc.), and (2) psychological study with humans that was psychometric, that is, involving tests that could be scored and converted to statistics. In 1913, American psychologist John Watson argued against an approach being pioneered by European psychologists, where human participants might “cooperate” with investigators by reporting about their mental processes. He maintained that since impartial investigators could not observe the working of the mind, asking people about their own thinking produced horribly unreliable, unscientific information. Therefore, Watson contended that psychologists should stick to examining observable behaviors. 13

Following Watson, American psychologists kept their studies in the laboratory or a carefully controlled setting, apart from messy “real-world” inter-

Conditioning Through Stimulus and Response

In the 1920s, Russian physiologist Ivan Pavlov’s experimental studies laid out the principles of learning that became the foundation of behavioral psychology. Very briefly, Pavlov discovered that dogs he was using in experiments on digestion started salivating when the feeder approached. This accidental finding led to his classical studies of “conditioning.” In these studies, he would produce a tone before feeding a dog and over time condition, or “teach,” the dog to salivate in response to the tone—actual food no longer being required to get the dog’s digestive system going. Pavlov thus proposed that learning at its most elementary level involved the involuntary (without a goal or purpose) association of stimuli (whatever prompts or activates behavior) and a set response.

Like Pavlov’s work, behavioral learning theories of human learning focus on external events before learning (stimuli, input, causes) and observable actions after learning (responses, output, effects). Behavioral psychologists pay somewhat less attention to processes that take place at the moment of learning—tending to distrust drawing conclusions about processes they cannot observe or, in an experimental sense, carefully control. Applying behavioral principles is appealing because it seems to suggest a direct and relatively uncomplicated route to training. By training, we mean our ability to respond to situations—even complex ones—without having to figure them out, reason, or practice like we did the first times we faced the situation. For example, a driver of a car in a busy but familiar city, an expert piano player, and accomplished athletes are all engaging in complex, almost automatic, highly trained behavior. In these situations, people respond instantaneously to all but the most unexpected events, and they are usually not aware of any thinking at all.

For a more elaborate human example of this basic learning behavior (called conditioned response), imagine yourself having once been terribly embarrassed because your teacher asked a question while you were daydreaming. Since then, whenever you catch yourself daydreaming in class, you jump back to attention with a sense of panic. You respond to the one stimulus (daydreaming) as if it were no different from the “actual” threat. You respond as if you had actually been caught and embarrassed.
Learning as Pursuing Rewards and Avoiding Punishment

Studies of stimulus and response dominated experimental psychology through the 1940s, but it was psychologist B. F. Skinner’s theories in the 1950s that focused renewed interest on behaviorism and learning. Skinner built on the earlier work of Edward Thorndike, who conducted studies of animal learning early in the twentieth century. Thorndike discovered two important learning principles. First, he observed that animals learned to repeat intentionally a particular “accidental” movement (e.g., sliding open the bolt to a cage) when their action was reinforced by the reward of the food. Second, he found that animals improved the speed of their problem solving with “exercise,” or repetition.

Like Thorndike, Skinner focused on prompting purposeful and voluntary behavior. Although he appreciated the enormity of the task, he believed, in principle, that by breaking down complex behaviors into their simplest component parts, it was possible to understand and take charge of one’s own or another’s behavior. Skinner’s ultimate goal was to develop a science of behavioral control that would promote widespread happiness in a well-engineered society.

Classical conditioning theories had focused on reinforcing existing behaviors—such as Pavlov’s salivating dogs. Skinner’s goal, however, was to establish psychological laws for conditioning, or causing a subject to acquire new behaviors or stop undesirable ones. He developed a variety of strategies for reinforcing desired behaviors with rewards or by removing something negative; he also developed strategies for suppressing undesirable behaviors with punishments.

Schooling as Behavioral Training

Schools quickly saw behavioral psychology as enormously advantageous to their work. It helped make education more scientific at a time when being scientific brought increased respectability and higher status. Likewise, in an era when assembly-line efficiency had earned admiration throughout the culture, behavioral theories promised to help schools direct students’ attention and energy toward classroom tasks and train them in the good habits that would be expected in the world of work. Finally, at a time of increasing uncertainty over what should be taught, behavioral methods exercised subtle but powerful influence over school curricula—causing schools to emphasize the type of knowledge suited to behavioral methods. Generations later, schools would still be trying to shake loose from behaviorism with calls to emphasize problem solving, critical thinking, and other “higher-order” tasks.

Teaching as Transmitting Knowledge Scientifically

Early in the century, Thorndike combined the results of his animal studies with philosopher and psychologist William James’s theory that systematic exercise and drill could build proper habits of thought in humans. He applied his scientific “laws” of learning to classrooms, reasoning that drill and practice corresponded to his Law of Exercise; that is, the more often a child repeats a correct answer, the more likely that answer will be permanently “connected” to the question or problem. Thus, Thorndike recommended that teachers enhance children’s language learning by exposing them to the same words over and over, and that they increase their pupils’ facility with mathematics by having them practice common calculations repeatedly. Thorndike’s Law of Effect, which was built on stimulus-response theory, held that if a child’s correct response were rewarded with something pleasant—a smile or candy, for example—he or she would be more likely to repeat the response. Clearly, Thorndike saw teaching as a science aimed at efficiently controlling student learning. He believed scientific tests enabled teachers to address students’ particular mental capacities and prepare students for particular social roles based on those mental capacities.

Like Thorndike, Skinner applied his behavioral theories to classrooms. He developed “teaching machines” that instructed by presenting knowledge in small chunks and providing constant rewards or reinforcement. Thorndike’s behaviorist approaches formed the foundation for twentieth-century teaching theories, and Skinner’s refinements were embraced enthusiastically in the late 1960s and the 1970s. Educational historian Joel Spring argues that Skinner’s behavioral theories were widely applied, in large part, because they reflected the increasingly conservative tenor of the Nixon era. Behavioral theories supported greater control over the teaching process and over student behavior—both of which were seen by conservative critics as having run amok. Interestingly, neither Thorndike nor Skinner had their work catch on outside the United States.

Countries whose student achievement Americans came to envy in the 1980s managed to be superior without paying much attention to America’s behavioral reforms. However, so strong is this country’s attachment to behavioral models that the back-to-basics movement of the 1990s would reassert these models in attempts to surpass the foreign “competition.” These reforms are discussed further in Chapters 4 and 5 in relation to the school curriculum.

The first educational hallmark of behaviorism is the insistence that for learning (a behavior change) to take place, teachers must present students with the smallest and simplest units of complex behaviors. The second rarely questioned hallmark is that changing behavior (learning) requires conditioning through positive and/or negative reinforcement. Behaviorists have spun out an incredible variety of refinements to managing the rewards and punishments that presumably lead to desired goals. From these principles, psychologists and many others interested in understanding, controlling, or improving behavior draw their applications for education. They use them to explain how teachers can motivate students to learn, specify the details of what students should learn, reinforce correct responses, and manage student behavior in class.

In Pursuit of Psychological Efficiency

The constant press for schools to “do better” is met each decade—each year—by many who promise straightforward, often simple ways to rapid learning and school improvement. Many methods blend the scientific efficiency of modern
production with the psychological efficiency of behaviorism. Since the 1970s, for example, hundreds of thousands of teachers have learned an approach called "Mastery Teaching" or "Clinical Instruction" developed by Madeline Hunter. Hunter's strategy, reminiscent of both Herbart and Skinner, specifies the steps of an "effective" lesson based on behavioral learning theory.

In Hunter's method, teachers begin each lesson by providing students an anticipatory set—a provocative question or activity to preview of the information and tasks to follow. The second step conveys the learning objectives unambiguously, nearly always expressed as what teachers expect students to know or be able to do at the end of the lesson. Then teachers present the information or skill to students using a variety of materials and familiar examples. Next, the teacher or an already accomplished student would model of the correct behavior or response. The teacher would give the students opportunities for guided practice, all the while monitoring and checking for understanding to determine whether students are acquiring the knowledge or skill. For example, before individuals are asked to demonstrate their knowledge, the teacher asks the whole group to respond—with either hand signals or choral recitation. Throughout the lesson, the teacher prompts and cues when needed and reinforces correct responses with praise. After most students seem to have "gotten it," the teacher provides them an opportunity for independent practice, and she gives feedback immediately. Although the preceding terms may sound unfamiliar, the lessons surely are not. These are the lessons that most adults today experienced, though few had teachers who actually "mastered" the complex orchestration of the methods and rules.

This approach seems logical to many teachers, and it actually helps them achieve certain behavioral objectives. Inexperienced teachers, in particular, seem to appreciate the security of concentrating on what they, the teachers, are supposed to do next, rather than the difficult and ambiguous job of constantly responding to what students are thinking and learning. However, research into the method has not provided evidence that it helps children learn, or be more effective citizens. There seems to be no substitute for keeping instruction focused on students' learning rather than teachers' teaching. Neither is there evidence that of the thousands trained in the method, any more than a small percentage of teachers continue to practice it.

Motivating with Rewards and Punishment

Adults often explain children's failure by stating that they lack motivation. People commonly assume that motivation comes and goes, as when they say, "I don't feel motivated today." Some see motivation as an action, like spanking or encouraging: "What can I do to motivate that child?" Clearly, motivation is a flexible and useful idea for referring to the unseen energy and determination that drive people to take charge of their actions. However, two people using the term may have very different premises about what it describes.

How people use the term motivation reveals much of what they believe about learning. Not surprisingly, the behavioral view of motivation rests heavily on reinforcement (reward and punishment). Its appeal is easy to understand. Long before first graders have a well-developed understanding of proper classroom behavior, teachers can motivate and train them with rewards and punishment not to talk while others are talking and to raise their hands before speaking. Teachers who are skilled classroom managers can accomplish this after a relatively short period. However, they run the risk that, if the rewards and punishments stop, so will the desired behavior. Often, maintaining good behavior requires increasingly large rewards or punishments.

Educators and psychologists commonly distinguish between extrinsic motivation, which comes from someone or somewhere else, and intrinsic motivation, which is generated from within. Rewards and punishments are associated with extrinsic motivation, and they can be efficient in starting or stopping simple, routine acts and habits. But as behaviors become more complex, systems for rewards and punishments must become equally elaborate. Rewards and punishments ultimately become harder to keep convincingly aligned with the behaviors they must influence.

Controlling Misbehavior with Behavioral Training

Thousands of teachers around the country have been trained in "assertive discipline," probably the most popular current behavioral strategy for keeping classrooms orderly. When teachers use assertive discipline, they establish a clear set of classroom rules and a highly visible schedule of consequences for breaking them. For example, at the first infraction, the teacher might warn the student verbally and write her name on the board; the second offense might bring a check mark next to the written name; at the third, the teacher would remove the student from the room or keep her after class. A telephone call home would likely follow, and so on, with more severe consequences if the misbehavior continues.

Many teachers find these behavioral management schemes useful, but often the benefits are temporary and the long-term consequences are negative. The following reflection from first-year teachers Julie McKay and Julie Bossutow tell just such tales.

I have about five students who already had been labeled as "problems" and who had gone through every assertive discipline plan imaginable. Daily contracts with teachers, yearly contracts with the principal, numerous parent conferences, and Student Study Team reviews had all been tried. The end result was merely that the students knew they were "problems." It was amazing to me to realize how savvy they were about the deals they had made with their teachers and administrators—how they knew the conditions...
of whichever contract they were on. Unfortunately, my realization came after I made the same type of contracts (upon the advice of administrators and past teachers), and once again the students fell into the same negative behaviors.

—Julie McKay
First-year teacher, grade 4

I have developed a system of sticker cards wherein the students can receive a sticker for each of the four periods of the day. Their name goes up in a happy face on the board if they are on task and following the rules. If their name stays in the happy face for the entire period, they get a sticker on their card. If they don't get a sticker, I write on the card the exact reason why they didn't. These cards go home every Friday (and are returned signed by the parents on Monday), and their parents can see exactly what has transpired with their child for that week in the classroom. I also give the whole class points for following the rules that can be applied to extra center time, and I give table points for the tables of students who stay on task and who are behaving properly.

So why is it that I resort to yelling and being angry sometimes instead of relying on the discipline methods that I have instituted? This is a question that I continually reflect upon. I have problems with extrinsic rewards and haven't been able to totally accept their effectiveness for first graders. I have problems with being consistent. The system of sticker cards that I have set up requires time and often I don't make that time available. But, most importantly, I think I'm still waiting for my students to respond from a more intrinsic perspective that I believe should come from their desire to learn and to be treated with respect.

—Julie Bostow
First-year teacher, grade 1

These teachers' experiences are not unusual. Systematic studies of assertive discipline have not supported it or other behavioral schemes as a helpful approach to curbing most student misbehavior. It is certainly a legitimate human response to express delight with behavior that pleases and to sometimes ignore undesirable behavior. It is just not very useful to try to work these human responses into a rational scheme for controlling behavior. Education writer John Kohn has written convincingly about the harmful effects of praise if the raise becomes more important than the intrinsic importance of action correctly. Sometimes people get so accustomed to praise that if they do not get it, they cannot feel that the activity is worthwhile.

In school, rewards often become the objects of negotiations that distract from the particular learning focus at hand ("If you do this thing you don't want to do, I will reward you by letting you do something you like"). Sometimes negotiation becomes an end in itself—especially when trying to change the behavior of a skilled student negotiator ("OK, class, finish the book report for homework, and tomorrow we can watch the movie... OK, just a draft, but a really good one... OK, I'll check your progress on the draft tomorrow and I'll collect it on Monday"). Sometimes punishment or the threat of punishment makes a person feel so bad she wants to act in a way to avoid the punishment, but other times a punishment reinforces negative behavior ("You are suspended from school for a week").

Behavioral approaches do shape behavior; they work well for teaching small, discrete behaviors. They help to socialize children with habits approved by the culture. The behaviorists were not wrong about the usefulness of conditioning for managing classroom discipline. If teachers want quiet and orderly students, at least in the short run, conditioning with rewards and punishment will help. Moreover, rewards and punishments seem so fundamentally engrained in human behavior that we cannot imagine the world or individuals functioning without them—at some level, they are here to stay. Visit most any classroom, and you'll see rewards and punishments aplenty. But if behavioral approaches to teaching succeed in limited ways, they are severely limited for promoting the deep understanding and the problem-solving skills needed for the next century's challenges.

The Limits of Transmission and Training

Remedial Math, called Math 1, is a thirty-year-old program that was said to be successful when it was first implemented. The individualized program allows the students to advance at their own pace in mastering the four basic mathematical operations: addition, subtraction, multiplication, and division. The four basic operations are applied to five main topics: Whole Numbers, Decimals, Percents, Fractions, and Measurements. Each of the five topics has its own workbook.

Students are to practice in their workbook, correct the work, and take the test when the teacher deems they are ready. If the student fails the test, then he/she does another practice page and retakes the test. There are days when they do not want to do the pre-made problems. These problems have absolutely no meaning or relevancy to their lives. The students have to do at least one page of work to master the concepts, correct the answers to the odd-numbered problems, then patiently wait for the teacher to correct the even-numbered problems. Much time is wasted waiting for the teacher, and many times the teacher has three to five students waiting to be checked. By then, the students are restless and would rather do other work or chat with their friends (I do not blame them).

This repetitious and tedious process continues with no change for the entire school year. What is more devastating is the fact that the majority of the students do not retain what they have learned. They only learn for the test, and forget almost instantaneously. The horror continues as all of the
Math I teachers use the exact same set of tests. It makes it so tempting and easy to cheat. Tests have been stolen, as well as answer keys. Students will memorize the answers and give them to other students. This is the most ineffective method I have seen. There is very little teaching or learning taking place. It makes me sad and angry because this math year is virtually wasted.

—Dung Bich Lam

First-year teacher, mathematics, grade 9

Although all behaviorally based instruction is not as awful as the situation Dung Bich Lam describes, many teachers teach at schools where there is a heavy reliance on behavioral learning theories of instruction and on IQ. The transmission model of teaching and learning proposes that knowledge from the sender (teacher) is sent (transmitted) to the receiver (student). This model resembles a straightforward one-directional conduit or pipeline. The process asks the teacher to break down and organize the facts (curriculum and lesson planning), send the facts (teaching), monitor whether the facts have been received (testing), and try again if testing demonstrates that something was missed (reteaching).

Behaviorism Ignores Thinking

Sometimes theories and practices are instructive because of their failures. At the same time that B. F. Skinner's theories were refining behaviorism in classrooms, observers became increasingly aware of what behaviorism left out—thinking. Consequently, new theories of cognition (thinking) began to emerge. Along with the proliferation of behavioral methods came an equally vigorous critique from a group calling themselves cognitive scientists. But this was not just a battle between theorists in universities and laboratories, nor was it confined to educators and psychologists in opposing camps. The arena for the conflict was culture itself. To be sure, one found the battle about behavioral versus cognitive theories argued in scholarly journals and school faculty rooms, but it also took place in the highest policy forums in Washington, in state houses, at school board meetings, and across the dinner table when parents tried to understand junior's homework. International events, political ideologies, and the results of national elections helped shape, and continue to shape, the development and practice of these and other theories of learning. For example, the former Soviet Union's launch of an unmanned spacecraft in 1957 boosted enthusiasm for Skinner's promise of orderly and scientific learning, especially in the technical skills that Americans seemed to lack.

Behaviorism Can't Prepare a Nation of Problem Solvers

Many new and diverse voices entered the public education debates during the late 1950s and throughout the 1960s. Particularly influential were those who spoke from perspectives of fields of knowledge and practical disciplines. Their views had long been represented in elite schools, but now the country sensed that elites alone could not keep the country apace with the rest of the world. These were scientists who knew the kind of knowledge that was needed in laboratories, businesspeople who understood the demands on workers, and corporate leaders who appreciated the complex skills and relationships required in trade and finance. All concluded that citizens needed to be able to solve complex problems, not just step-by-step accumulations of simple ones. Students needed to draw knowledge from real life, not just learn the information "building blocks" provided in the classroom. Memorizing the pieces of knowledge produced by science was not enough; students must learn to think like scientists.

The environment during the liberal Kennedy and Johnson years encouraged breaking with traditions in social structures and thinking. For example, in the 1960s, President Kennedy brought into the White House a "kitchen cabinet" of young, mostly Harvard-educated intellectuals to advise him about solving domestic social problems as well as managing international diplomacy; most stayed on to help Lyndon Johnson strategize in the Vietnam War and the war against poverty at home. Independent think tanks filled with social scientists who offered expertise and policy advice. If social science were to unlock the keys to international relations and remedy the ills of poverty and racial injustice, as well as enable the United States to compete in the arms and space race, then schools must produce large numbers of graduates who were thinkers and problem solvers.

Religious and political conservatism of the 1980s and 1990s supported traditional and behavioral preferences for schooling. And yet, it was during these years that the "cognitive revolution" took over as mainstream educational theory. Of critical importance was that advocates for social justice were conducting powerful research and developing models for teaching to support a common school curriculum and multicultural perspectives. The promise of linking a good education and a good society seemed possible once again.

Digging Deeper

The scholars and works listed in this section should provide readers with a deeper understanding of the development of IQ and behavioral psychology and the limits of these approaches for today's classrooms. The "Digging Deeper" section at the end of Chapter 3 points to research and the teaching implications of newer, more hopeful conceptions.

Daniel W. Bjork, who teaches history at St. Mary's University in San Antonio, Texas, has written a well-reviewed biography, B. F. Skinner: A Life (Washington, DC: American Psychological Association, 1997), that traces the psychologist's life and work. Bjork draws on the Skinner collection in the Harvard archives and other sources to highlight the development of his thinking. B. F. Skinner explained his theories of behaviorism and his wish to improve society through systematic behavioral control and positive reinforcement in two widely read books, Walden Two and Beyond Freedom and Dignity.
Stephen Jay Gould’s The Mismeasure of Man (New York: W.W. Norton, 1996) traces the history of efforts to classify and rank people according to their supposed genetic gifts and limits. This revised edition includes a new introduction telling how and why he wrote the book and tracing the subsequent history of the controversy on inherited characteristics, right through The Bell Curve. The book also includes five essays, dealing with The Bell Curve in particular, and with race, racism, and biological determinism in general.

Asa Hilliard is an educational psychologist and professor of urban education at Georgia State University in Atlanta. Hilliard served as an expert witness in several landmark federal cases on test validity and bias, including the Larry v. Wilson Riles IQ test case in California—a case that outlawed the use of IQ tests for classifying African American students as mentally retarded. His book Testing African-American Students (Chicago: Third World Press, 1996) explores issues of educational equity in assessment, particularly regarding the use of IQ tests with African American students.

Alfie Kohn’s book Punished by Rewards: The Trouble with Gold Stars, Incentive Plans, A’s, Praise, and Other Bribes (Boston: Houghton Mifflin, 1995) argues against the use of rewards in raising children, teaching students, and managing workers. Kohn makes the case that rewards, like punishments, are methods of controlling people (perhaps, a morally objectionable goal), and that, at best, they produce only temporary compliance. He traces the development of behaviorist doctrine and its widespread acceptance. Moreover, Kohn calls The Bell Curve, published in 1994, “little more than a hard-line version of Spearman’s g.” In Gould, The Mismeasure of Man, p. 35.


Pioneering German psychologist Wilhelm Wundt introduced what might have become in America a third line of inquiry—the systematic analysis of the perceptions, interpretations, and judgments that people report. Wundt was influential in Europe but American investigators found Wundt’s procedures—talking to people and recording what they report—less than scientific.
