Chapter 10
Intelligence

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Interactive Presentation Slides for Introductory Psychology: 11 Intelligence

Worth Video Series:

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- Video Anthology for Introductory Psychology: Nature, Nurture, and Human Diversity – Are Today’s Girls Academically Superior to Boys?
Chapter Objectives

After studying this chapter, students should be able to:

1. Describe the origins of intelligence testing in the French school system, noting the contributions of Alfred Binet and Theodore Simon to the development of the *ratio IQ* and explaining how the *deviation IQ* was eventually adopted.

2. Summarize the research evidence showing that intelligence test scores predict a range of outcomes, such as educational level, job performance, political and religious attitudes, and life experiences, such as divorce, incarceration, or unemployment.

3. Describe the evidence that led Charles Spearman to conclude that a *two-factor theory of intelligence* was appropriate for describing the nature of intellectual performance.

4. Describe the evidence that led Louis Thurstone to conclude that a multiple-factor theory of intelligence was appropriate for describing the nature of intellectual performance.

5. Discuss how a three-level hierarchy offers the most compelling account of intelligence test data.

6. Contrast the *data-based* and *theory-based approaches* to determining the middle-level intellectual abilities.

7. Give a brief description of the eight independent middle-level intellectual abilities developed in the data-based approach taken by John Carroll, including *fluid intelligence* and *crystallized intelligence*.

8. Discuss the three factors of *analytic intelligence*, *creative intelligence*, and *practical intelligence* identified by Robert Sternberg’s theory-based approach to intellectual performance.
9. Define *emotional intelligence* and give some characteristics of emotionally intelligent people.

10. Distinguish between *identical twins* and *fraternal twins* on the basis of their respective genetic makeups; from twin studies, discuss how intelligence is related to genes.

11. Explain what a *heritability coefficient* is and discuss how it contributes to our understanding of the genetic basis of intelligence.

12. Contrast the *shared environment* and the *nonshared environment*, and comment on how this distinction relates to understanding the role of heritability in intelligence.

13. Describe how intelligence changes with age and across generations (the *Flynn Effect*).

14. Discuss how economics, breastfeeding, birth order, and education influence intelligence.

15. Provide an example illustrating how genetic and environmental factors interact in complicated ways to determine intelligence.

16. Describe the extremes of intelligence and discuss what impact *intellectual giftedness* or *intellectual disability* has on an individual’s mental health.

17. Distinguish between group differences in intelligence test scores and group differences in intelligence; discuss why differences in test scores may not necessarily indicate differences in underlying intellectual ability, and discuss why group differences in intelligence may not be the result of genetics.

18. Describe the current state of research on drugs to enhance intelligence.

I. HOW CAN INTELLIGENCE BE MEASURED?

(Chapter Objectives 1–2)

Early intelligence tests were designed to predict a child’s scholastic performance but were eventually used to calculate an intelligence quotient either as a ratio of the person’s mental to physical age or as a deviation of the person’s test score from the average scores of his or her peers. *Intelligence* is a hypothetical property that cannot be directly measured, so intelligence tests measure responses (to questions and tasks) that are known to be correlated with consequential behaviors that are thought to be made possible by intelligence. These consequential behaviors include academic performance, job performance, health, and wealth, all of which are enhanced by intelligence.
Lecture Suggestion 10.1

An Intellectual History of Intellectual Pursuits

For quite some time, a lot of smart people have been interested in what makes people smart. Many theoreticians and researchers from psychology, education, philosophy, political science, and other disciplines have weighed in on the conceptualization and measurement of intelligence.

Information about these thinkers has been gathered together at one Web site. The Indiana University School of Education, the Society for the Teaching of Psychology, and the SBC Fellows Program at IU sponsor the Web site found at http://www.intelltheory.com/. There you can find a timeline of historical developments in intelligence testing, biographical profiles of intelligence researchers, a discussion of current controversies in the field, and just about any other information you’d need to round out a fine presentation on intelligence. You’ll also find a wealth of information to share with your students during your lecture, as you incorporate the Web site into your classroom presentation.

You might also encourage your students to visit the site, either for their own edification or as part of a class assignment. For example, you might assign teams of students to create a short presentation on the life and work of a noted intelligence theorist or perhaps to contrast the approaches of two well-known figures. Alternatively, you might ask students to write a brief paper on a controversy in intelligence testing or measurement, or ask them to summarize the major developments that took place during a specific period in the history of intelligence testing. Use your imagination to capitalize on the resources available on this fine Web site.

Lecture Suggestion 10.2

Does a High IQ Make You Smart?

If you have ever wondered who has the highest recorded IQ score, you might think of Albert Einstein or Stephen Hawking or some other famous scientist, but you’d be wrong. Marilyn Mach, born in St. Louis in 1946, scored an amazing 228 on the Stanford-Binet IQ test when she was only 10 years old. The average score on the Stanford-Binet is 100, and a score of 116, only about half as high as Marilyn Mach’s, places a person in the top 16% of the population. When Marilyn was older, she adopted her mother’s maiden name, and is now known as Marilyn vos Savant. You might be surprised to discover that she only completed two years of college, and didn’t earn a degree. Marilyn has an interest in creative writing, and has written 12 books and 3 plays. She lives in New York with her husband, where she writes a newspaper column (for Parade magazine), lectures on intelligence, and pursues various other interests.

For contrast, consider Dr. Robert Jarvik, the inventor of the Jarvik artificial heart. Unlike Marilyn vos Savant, Jarvik was a poor test taker. In fact, he scored too low on intelligence and admissions tests to be admitted to any medical school in the United States. Eventually, he was accepted by a medical school in Italy, where he completed his
studies and received his medical degree. He then returned to the United States and made his contribution to medical science. Dr. Jarvik combined his medical knowledge and his mechanical genius to produce the world’s first workable artificial heart, a contribution that has kept many seriously ill heart patients alive until a suitable transplant could be performed. Should Dr. Jarvik ever like to learn how to score higher on intelligence tests, he might just ask his wife, Marilyn vos Savant.

**Classroom Exercise 10.1**

So You Think You’re Smart, Eh?

It seems that years ago the word “Mensa” carried with it a bit more mystery than it does today. Perhaps it was all those quizzes in the *Reader’s Digest*, or those appearances by smart people on Johnny Carson’s *Tonight Show* or the *Mike Douglas Show*, that gave Mensa its cachet. For whatever reason, young people don’t seem as eager to want to join Mensa as they once did. You can help change all that.

Mensa International is still an active group, and it is still highly selective. To be eligible for membership an individual must score in the top 2% of the population on a standardized intelligence test, and proof of the score must be provided by a qualified test administrator. An alternative is to be tested through Mensa itself; the organization is happy to provide information about how to do that.

But if your students aren’t looking to expand their résumés with a “Member, Mensa International” title, they might still have fun learning about the organization. The Web site can be found at http://www.mensa.org/. It provides information about the history of the group, membership qualifications, the benefits of membership, and most important, a quick quiz (not officially recognized as a criterion for membership) that your students can take.

Have some fun in this section of your course by steering students to the Web site and gathering their reactions, either informally or in a short reflection paper:

- How do the goals and procedures of Mensa dovetail with the goals and procedures of academic researchers studying intelligence?

- Why would a standard top 2% be relevant to the way intelligence is typically measured and distributed in the population?

- Do the items on the Web site’s quiz bear any relation to the types of items your students might have seen on intelligence tests in the past (e.g., measures of cognitive performance they might have taken in an academic context)?

Source:

http://www.mensa.org/
Multimedia Suggestions

Feature Film: I Am Sam (2001, 132 min, rated PG-13) Sean Penn portrays Sam Dawson, a person with mental retardation fighting for custody of his 7-year-old daughter. It’s tough; the child is smarter than her father is capable of becoming. Sam talks a high-priced lawyer into taking his case pro bono, and both learn about life and love from one another.

Feature Film: IQ (1994, 100 min, rated PG) Tim Robbins and Meg Ryan star in this romantic comedy that somehow involves Walter Matthau playing the role of Albert Einstein. Meg Ryan is Einstein’s niece, and Einstein likes Tim Robbins’s character, so Einstein and Kurt Godel and some of their cronies arrange ways to make the niece fall in love with Robbins. You might also check out 1988’s Young Einstein, featuring the world-renowned Australian comedian Yahoo Serious in the title role, for more smart humor.

See the Preface for product information on the following items:

Interactive Presentation Slides for Introductory Psychology 11 Intelligence

PsychSim 5 Tutorials Get Smart

Worth Video Series

Video Anthology for Introductory Psychology: Intelligence – Locking Away the “Feebleminded”: A Shameful Story

Video Anthology for Introductory Psychology: Intelligence – Pros and Cons of Intelligence Tests

II. WHAT IS INTELLIGENCE?

(Chapter Objectives 3–9)

A person’s score on one test of mental ability is likely to be highly correlated with his or her score on another. This led Charles Spearman to suggest that performances require \( g \) (general intelligence) and \( s \) (specific abilities). Modern research suggests that a three-level hierarchy better describes intelligence with a group of middle-level abilities between \( g \) and \( s \). The data-based approach, also known as a bottom-up approach, suggests that there may be eight middle level abilities, but theory-based or top-down approaches suggest that there may be some middle-level abilities that intelligence tests don’t measure.

Cultures may disagree about what constitutes intelligence, but Western scientists agree that it involves reasoning, planning, solving problems, thinking abstractly, comprehending complex ideas, and learning quickly from experience.
Lecture Suggestion 10.3

The Structure of Hay Bales

There has been no shortage of theories of intelligence and no shortage of proponents offering single- or multiple-factor explanations of what intelligence is. From the earliest days of $g$ to the more recent arrangement of a three-level hierarchy of intellectual skills, everyone’s had a go at explaining how intelligence should best be explained.

One of the more ambitious approaches to understanding intelligence was developed by J. P. Guilford (1897–1987). During the 1950s through 1970s, Guilford’s *structure of intellect model* received considerable attention, although it has recently fallen from popularity. Perhaps that’s because Guilford proposed a whopping 180 separate mental abilities, the whole collection of which could be termed “intelligence.” These abilities resulted from the combination of factors on three primary dimensions of intellectual ability: *Operations* refers to intellectual processes that are performed on information, *Contents* refers to kinds of information that can be operated on, and *Products* refers to the results of applying operations to contents. There are several factors within each dimension, as outlined in the following list (also see Handout 10.1):

**Operations (6 kinds)**

- Cognition—The ability to understand, comprehend, discover, and become aware of information.
- Memory recording—The ability to encode information.
- Memory retention—The ability to recall information.
- Divergent production—The ability to generate multiple solutions to a problem (i.e., act creatively).
- Convergent production—The ability to deduce a single solution to a problem.
- Evaluation—The ability to judge whether information is accurate, consistent, or valid.

**Contents (5 kinds)**

- Visual—Information perceived through seeing.
- Auditory—Information perceived through hearing.
- Symbolic—Information perceived as symbols with no meaning in themselves (such as numerals or letters of an alphabet).
- Semantic—Information perceived in words or sentences; can be oral, written, or silently in one’s mind.
- Behavioral—Information perceived as acts of an individual or individuals.
**Products (6 kinds)**

Units—Single items of knowledge.

Classes—Sets of units sharing common attributes.

Relations—Units linked as opposites or in associations, sequences, or analogies.

Systems—Multiple relations interrelated to constitute structures or networks.

Transformations—Changes, perspectives, conversions, or mutations to knowledge.

Implications—Predictions, inferences, consequences, or anticipations of knowledge.

The combination of 6 operations × 5 contents × 6 products yielded 180 separate abilities. Guilford’s model came to be known affectionately as the “hay bale,” given its resemblance to that staple of farm life (perhaps also reflecting Guilford’s roots in Nebraska). In fact, when new graduate students join his laboratory, they often asked, “Which part of the hay bale are you working on?”

Trained as a psychometrician, Guilford and his students set the goal of developing a reliable and valid measure of each of the 180 abilities, many times hoping to develop alternate forms of such measures or multiple measures of each ability. With only so many years on the planet (although he was 90 when he died) and only so many research assistants, that goal was never realized.

What did develop along the way, however, were many theoretical advances that later blossomed into richer views of intelligence. For example, the study of creativity was greatly informed by Guilford’s notion of *divergent production*. Similarly, Guilford proposed *social intelligence* as a kind of ability not traditionally tapped by most measures of intellect. Evaluation of behavioral relations might be one such example. The general tenets of social intelligence had a clear impact on the later development of *emotional intelligence*. Although the hay bale may have been blown about by the wind over the years, its scatterings have helped fertilize other intellectual soil.

Sources:


**Classroom Exercise 10.2**

How Many Uses Can You Think of for This Exercise?

Creativity and intelligence have been linked many times over the history of psychology: Smart people are often quite creative in what they think and do. One measure of creativity is divergent thinking, which takes place when a person considers novel uses, applications, or extensions of an object or situation.

You can illustrate divergent thinking with a simple example.

- Ask your students this question: How many uses can you think of for a brick? (If you’d like to make this exercise tangible, why not bring an actual brick to class?)

- Give them 10 minutes or so to write down all the uses they can think of, and urge them to be creative in their responses.

- After the allotted time has elapsed, have students exchange papers with one another, and score the responses in terms of divergence. Remind your students that this exercise is just for fun and is not a perfect measure of intellectual ability.

Here’s an example. Saying “use it as a paperweight,” “use it as an anchor,” “use it to hold two pieces of glued wood together as they dry,” and “use it to hold a small dog’s leash on the ground” is certainly novel, but not all that creative. There’s not much divergence in the thought process; all of these examples involve using the brick as a weight. However, responses such as “use it to deliver a message through someone’s front window,” “grind it up and use the wet dust to paint a picture,” or “use it to judge whether other objects weigh less or more than it” show a bit more divergence.

**Discussion:**

If your class is large enough, you might consider posing other divergent thinking questions, such as “How many uses can you think of for a . . .” paperclip, coat hanger, toothpick, thimble, automobile tire, nail file, piece of paper, small rubber ball, empty vegetable can, light bulb, square of tile, 2 feet of twine, used compact disc, button, or any other common object.

**Multimedia Suggestions**

*Feature Film: Good Will Hunting (1997, 126 min, rated R)* According to *Premiere* magazine, this is one of the “20 most overrated movies of all time.” But many people liked this tale of a young janitor who was also a math prodigy (played by Matt Damon). Will Hunting’s struggles with solving obscure problems in mathematics were nothing compared to his struggles with solving the problems of life. Luckily his buddies Minnie
Driver, Ben Affleck, and Robin Williams are along to help. This movie has several good scenes related to intelligence and has probably been seen by most of your students.

See the Preface for product information on the following items:

**Interactive Presentation Slides for Introductory Psychology** 11 Intelligence

**Worth Video Series**

- Video Anthology for Introductory Psychology: Intelligence – Savant Music Skills
- Video Anthology for Introductory Psychology: Intelligence – Savant Art Skills in Autism and Dementia

**III. WHERE DOES INTELLIGENCE COME FROM?**

(Chapter Objectives 10–15)

Genes exert a significant influence on intelligence. The *heritability coefficient* \( h^2 \) tells us what percentage of the differences between different people, in this case intelligence, is attributable to differences in their genes, and we find that the heritability of intelligence changes depending on the socioeconomic status and the age of the people being measured.

Genes may directly influence intelligence, and they may also influence it by determining the environments to which people are drawn and by which they are shaped. Education has a moderate influence on intelligence.

**Lecture Suggestion 10.4**

*Felis Smarticus*

“Give a man a fish; feed that man for a day. Teach a man to fish; feed that man for a lifetime.” This quote from the Chinese philosopher Lao Tzu is well known. Its meaning suggests that doing is better than watching or simply receiving; activity trumps passive learning. There’s a parallel to cats, who, by the way, really like fish: “Get a cat to watch, it might learn something. Get a cat to do, and the cat will be smarter.”

David A. McVea and Keir G. Pearson of the University of Alberta found that, quite sensibly, cats use visual information when making sense of their worlds. Seeing an obstacle in their path, for example, leads cats to avoid that obstacle, and in fact this behavior remains for a short time, even if the visual input is removed.

However, to truly learn something, a cat needs to be actively engaged with the environment. McVea and Pearson had cats step their forelegs over a three-inch barrier. They then distracted the cats (which usually wasn’t for long, given the nature of cats!) while the barrier was lowered. When the cats returned to stepping, they raised their rear legs as though the barrier was still there. For that amount of time, the cats retained the
information about the barrier and used it to guide their actions. In a variation on this experiment, cats sometimes saw the barrier but were stopped before they crossed it. When the cats progressed after more than a few seconds, they failed to raise their rear legs high enough. This suggests that the movement of the front legs is what helps solidify the information; in other words, the active engagement with the environment directly contributes to the retention of knowledge. In fact, when the cats could feel the obstacle but not see it, similar results were obtained. This suggests that it’s not the visual cues that drive the behavior, but rather activity in the motor cortex.

The parallels to human intelligence are intriguing. Many educators have advocated the use of active learning in the classroom and apparently for good reason: doing, rather than simply hearing or reading, holds benefits for humans and cats alike.

Sources:


Lecture Suggestion 10.5

The Cyril Burt Affair

The Cyril Burt affair refers to a controversy surrounding Cyril Ludowic Burt, the renowned statistician and promoter of the hereditarian view of intelligence.

Almost immediately after his death in 1971, researchers began questioning the validity of Burt’s data on intelligence in monozygotic twins. In 1943 Burt reported a correlation of .770 between the intelligence scores of 15 pairs of twins reared apart; in 1955, he reported a correlation of .771 for a total of 21 pairs of twins, and in 1966 a correlation of .771 for a total of 53 pairs of twins. The startling consistency among these correlations, despite the increases in sample size, led some scholars to level accusations of fraud against Burt. What’s more, researchers questioned his ability to find so many pairs of monozygotic twins who were reared apart. Finding 21 pairs of twins reared in such circumstances is pretty good, but to more than double that amount a mere ten years later seems either incredibly lucky or incredibly fishy. Other scholars, however, claimed that Burt was merely careless and a bit eccentric in his scholarship, and that his work remains valid. For example, Hans Eysenck, one of Burt’s students, came to his posthumous defense with tales of Burt’s characteristic carelessness in scientific pursuits.

Although many of the original players in this drama—Burt, Eysenck, Burt’s perhaps-fictitious research assistants—are long dead, the controversy remains. As recently as
2000, accusations and support were volleyed back and forth in the academic community. The issue may never be resolved to anyone’s satisfaction. Given the rhetoric surrounding genetic and environmental contributions to intelligence, one can only hope for some clarity in the not-too-distant future.

Sources:

http://www.intelltheory.com/burtaffair.shtml


Lecture Suggestion 10.6

Einstein’s Brain

Albert Einstein died on April 18, 1955, of a hemorrhaged abdominal aneurysm. Pathologist Dr. Thomas Harvey removed Einstein’s brain and kept it for scientific study. (The remainder of Einstein’s body was cremated, and the ashes were scattered at an undisclosed location.) Harvey’s findings were that on a gross-anatomical level, Einstein’s brain was no larger or heavier than a typical human brain. In fact, despite keeping the sectioned brain in his home (taking it with him whenever he relocated) and studying it, Harvey never did find much that was exceptional about it, and published no findings on the matter.

Over the years, however, Harvey gave away samples of the brain to interested researchers, who had better luck investigating its properties. For example, in 1996, Sandra Witelson obtained a significant section of Einstein’s brain and found that although it was reported as average in size and weight, the inferior parietal lobe was actually 15% wider than comparable parietal lobes. This brain area is associated with visual-spatial cognition, mathematical thought, and imagery of movement, all elements that were associated with Einstein’s thought process. (His theoretical insights were usually the result of mental imagery that he then translated into mathematical formulas.) Witelson
and her colleagues also found that the Sylvian fissure, which separates the frontal and temporal lobes, was shorter than average, suggesting tightly packed neurons and interconnections, and thus increased communication between neurons in this brain region.

Furthermore, in the 1980s, Marian Diamond at the University of California, Berkeley, compared the ratio of glial cells to neurons in Einstein’s brain with that of 11 men who had died in comparable circumstances. She found that Einstein’s brain had about 73% more glial cells than average (especially in the inferior parietal cortex), suggesting that his neurons had a greater metabolic need.

In 1998, Dr. Harvey passed the remaining sections of the brain along to Dr. Elliott Krauss, a pathologist at Princeton University. Harvey died, perhaps fittingly, at the University Medical Center at Princeton on April 5, 2007. Somehow his 50-year infatuation with Einstein’s gray matter came full circle back to central New Jersey. It is still unclear whether Einstein was born with an extraordinary brain or whether the brain reorganized itself around Einstein’s life work.

Sources:


http://www.post-gazette.com/pg/05107/488975.stm

Multimedia Suggestions

Feature Film: Charly (1968, 103 min, rated PG) Cliff Robertson won an Academy Award for Best Actor for his portrayal of Charly Gordon, a man of limited intellect who is selected to participate in an experiment. Charly receives a treatment that causes him to grow smarter, so much so that he reaches genius levels. But can he cope emotionally with these newfound changes? This movie is based on the book Flowers for Algernon by Daniel Keyes.

Feature Film: Flowers for Algernon (2000, 120 min, not rated) A more recent version is this made-for-TV adaptation of Flowers for Algernon. Matthew Modine plays Charlie Gordon this time; same mental deficits, same experimental treatment, same results.

See the Preface for product information on the following items:

Interactive Presentation Slides for Introductory Psychology: 11 Intelligence
IV. WHO IS MOST INTELLIGENT?

(Chapter Objectives 16–18)

Some groups score better than others on intelligence tests. Two explanations are (a) the situation—the situation in which the test is administered can impair the performance of some groups more than others, and (b) socioeconomic status—some groups live in less healthy, stimulating environments. There is currently no compelling evidence to suggest that between-group differences in intelligence are due to genetic differences.

Intelligence tends to decrease over the life span and increase across generations. Education increases intelligence, but its impact is smaller, narrower, and shorter-lived than we might wish. Cognitive enhancers can also increase intelligence, though it is not clear by how much. People who are extremely intelligent are not necessarily happier, and their gifts tend to be highly specialized.

Lecture Suggestion 10.7

IQ in Appalachia

Because the heritability coefficient for IQ is large, students sometimes have difficulty appreciating the impact that environment can have on changes in IQ. One example that demonstrates the tremendous impact of environment is the research that examined changes in IQ scores in rural Appalachia. Investigators measured the IQs of a sample of children ages 6–16 in 1930 and then tested a comparable group of children 10 years later in 1940. Between those two occasions average IQ scores increased 11 points. This large change in IQ had nothing to do with changes in the genetic stock of these Appalachian inhabitants, but rather had to do with the effects of the New Deal. As FDR and the U.S. government tried to pull the country out of the Great Depression, there was tremendous increase in government spending and programs that produced changes in the economic, educational, and cultural conditions of region, and it was these changes in the environment that accounted for the changes in IQ over this brief period of time.

Source:


Classroom Exercise 10.3

Koori IQ Test

James Wilson-Miller in Australia devised an IQ test that demonstrates to nonindigenous students and teachers how the value of knowledge is culturally constructed, and what it’s like to be assessed and graded on the basis of alien criteria. This test is intended to be culturally biased, except that it is biased toward the Aboriginal culture rather than the white majority culture. You can find Wilson-Miller’s explanation of the test along with

**Lecture Suggestion 10.8**

“Smart” Has Been Around Awhile

Humans are generally getting smarter, according to most measures you’d care to use. The education system is better than it was 100 years ago, more people have more access to more information, the Flynn effect indicates that average intelligence test scores rise about .3% every year, and in general, absolute intelligence tends to increase across the life span. Good for us. We’re smarter.

But humans have been pretty smart for a pretty long time. **Handout 10.2** shows a timeline of some major historical developments which, by most accounts, indicate smart behavior. For example, the earliest known evidence of using blades was found approximately half a million years ago. Given that anatomically modern humans date from about 130,000 years ago, blade use suggests that smartness was kicking around in the soon-to-be *Homo sapiens* gene pool for quite some time. Similarly, the use of notational pieces (such as the inscribed ochre found in Blombos Cave in South Africa) suggests that people were trying to keep track of things—their thoughts, their symbols, perhaps their to-do lists—as long as 100,000 years ago.

Admittedly, most anthropologists and archeologists agree that the 40,000 year mark was the kick-start for a lot of these developments. Although evidence indicates that these behaviors were around before that time, about 40,000 years ago is the time many more people routinely engaged in practices such as image making, blade use, and long-distance exchange. Even by these conservative standards, 40,000 years is a long time to be smart. When your students complain that technology isn’t developing fast enough for them, because they can’t yet watch 3D high-definition video on their iPhones, encourage them to be patient; intelligence sometimes takes a while to be recognized.

**Sources:**


Classroom Exercise 10.4

No Child Left Behind?

The No Child Left Behind Act of 2001 (Public Law 107-110) was signed into law by President George W. Bush on January 8, 2002. NCLB, as it’s come to be called, has sparked a considerable amount of debate, as politicians, educators, and the general public have voiced concerns about its provisions and argued the merits of what it was intended to accomplish. In 2008, NCLB came up for reauthorization, but what does this law actually say? Unfortunately, like a lot of policy in the United States, relatively few people have fully read or digested the contents of the law itself. This applies to the public and probably many lawmakers as well. It would seem that an act that holds sweeping ramifications for such an important aspect of daily life—the education of a generation of citizens—might receive a bit more attention.

- Ask your students to formulate a brief paper on NCLB, starting with a summary of the law and a synopsis of the major opinions regarding it (i.e., the thoughts of lawmakers, education professionals, students, and parents).
- Clearly this could be made into a major assignment, but the focus here should be on simplicity; this is an assignment to get your students thinking and to get them talking.
- Be sure to ask your students to link what they’ve learned about the law to what they’ve learned in your class, especially with regard to the material on learning, thinking, and intelligence.
- How do the stipulations in NCLB match what we know about the learning process?
- What prospects does NCLB hold for increasing an individual’s intelligence in an appreciable way?
- Given what we know about how humans engage in problem-solving and reasoning, how does NCLB either support or detract from those processes?

Given below are some sources of information to help your students get started. The law itself can be found on the Department of Education’s Web site.

Sources:


National Education Association (NEA): http://www.nea.org

No Child Left: http://nochildleft.com/
Classroom Exercise 10.5

Guess the Speaker

Everybody’s got an opinion about the value of education. From politicians to parents to the general public in between, there’s been no shortage of viewpoints about what education is, what it should be, how it should be administered, who should benefit, or how we can know if it’s working. That’s probably for the best; remember, “A mind is a terrible thing to waste.”

Speaking of pithy sayings such as that, Handout 10.3 contains several quotes from philosophers, politicians, policy makers, psychologists, and the public.

■ As a way of stimulating discussion about the quality and value of education, ask your students to examine the quotes and see if they can identify who said each one.

■ Have them draw a line from each speaker on the right to the correct quotation on the left.

Chances are good your students might be able to attribute a few of the remarks to the appropriate person, but accuracy really isn’t the point of this exercise. Rather, it should serve as a way to get students talking about education and its relation to intelligence. Given the variety of viewpoints expressed in these quotations, where do your students stand on this issue? What opinions do they hold about the contribution of education to the “getting smarter process?”

Here is a list of who said what:

_Abraham Lincoln:_
Give me six hours to chop down a tree and I will spend the first four sharpening the axe.

_Adolph Hitler:_
Universal education is the most corroding and disintegrating poison that liberalism has ever invented for its own destruction.

_African proverb:_
It takes a village to raise a child.

_Albert Einstein:_
It is a miracle that curiosity survives formal education.
Annie Sullivan:  
Children require guidance and sympathy far more than instruction.

Beatrix Potter:  
Thank goodness I was never sent to school; it would have rubbed off some of the originality.

George Santayana:  
Those who cannot learn from history are doomed to repeat it.

Gloria Steinem:  
The first problem for all of us, men and women, is not to learn, but to unlearn.

John Dewey:  
Education is not preparation for life; education is life itself.

John F. Kennedy:  
Remember that our nation’s first great leaders were also our first great scholars.

Maria Montessori:  
Establishing lasting peace is the work of education; all politics can do is keep us out of war.

Mark Twain:  
First, God created idiots. That was just for practice. Then He created school boards.

Nelson Mandela:  
Education is the most powerful weapon which you can use to change the world.

Pete Seeger:  
Education is when you read the fine print. Experience is what you get if you don’t.

Ralph Waldo Emerson:  
Skill to do comes of doing.

Thomas Jefferson:  
Whenever the people are well-informed, they can be trusted with their own government.

William James:  
Cramming seeks to stamp things in by intense application immediately before the ordeal. But a thing thus learned can form but few associations.
Multimedia Suggestions

See the Preface for product information on the following items:

*Interactive Presentation Slides for Introductory Psychology* 11 Intelligence

*Worth Video Series:*

- Video Anthology for Introductory Psychology: Nature, Nurture, and Human Diversity – The Art of Listening: Males Versus Females
- Video Anthology for Introductory Psychology: Nature, Nurture, and Human Development – Are Today’s Girls Academically Superior to Boys?
- Video Anthology for Introductory Psychology: Intelligence – Psychologist Ellen Winner Discusses “Gifted” Children
- Video Anthology for Introductory Psychology: Intelligence – Hothouse Babies: Mother Tries to Teach Her Two-Year-Old Multiplication

*Other Film Sources*

*A Conversation with David Wechsler* (1976, 55 min, IM). The developer of the WAIS, WISC, and WIPPSI ought to know a thing or two about the measurement of intelligence, and he tells you so in this film.

*A Little Matter of Gender: Developmental Differences among Savants* (2006, 53 min, FHS). Differences between the female and male brain also show up in differences between the female and male brains of people with autism. This program examines research in this area.

*As American as Public School: 1900–1950* (2000, 55 min, FHS). In 1900, 6% of American children graduated from high school; by 1945, 51% routinely did so. This video examines how the American education system changed and developed over a 50-year period.

*Battle of the Brains: The Case for Multiple Intelligences* (2007, 50 min, FHS). Is standardized testing the best approach for measuring intelligence among all individuals and all circumstances? Probably not. Different people, different skills . . . there’s a case to be made for multiple intelligences.

*Brain Box: Defining Intelligence* (2000, 2 parts, 50 min each, FHS). Intellectual development is the focus of this two-part series. As the brain grows and develops, it is capable of executing smarter activities.
Different Kinds of Smart: Multiple Intelligences (2003, 30 min, IM). What is “smart”? There are lots of definitions based on lots of types of evidence. This video considers several ways of answering those questions.

The Einstein Effect: Savants and Creativity (2006, 53 min, FHS). A boy who was mute until age 9 creates incredibly realistic drawings. A child who can barely form a sentence sculpts figures with amazing precision. How can people with low levels of abilities in multiple areas nonetheless show astounding abilities in some other areas? Watch and see.

EQ and the Emotional Curriculum (2000, 50 min, FHS). IQ and EQ—do they reveal much of anything about smart human behavior? In some cases yes; in some cases no.

Fragments of Genius: Understanding Savants (2000, 50 min, FHS). Savant syndrome seems exotic and mysterious, but so did a lot of other behaviors that eventually yielded to scientific inquiry. This program looks at research on the origins of extraordinary abilities.

Graduating Peter (2001, 76 min, FHS). The 1992 Academy Award–winning documentary Educating Peter focused on Peter Gwasdauskis, a child with Down syndrome who was mainstreamed into the third grade. This follow-up film chronicles Peter’s accomplishments in school during the sixth and eighth grade.

Human Brain Development: Nature and Nurture (2006, 30 min, IM). Nature and nurture interact to influence behavior in many domains. Intelligence is one of those. This film explores general arguments about the contributions of heredity and environment to human behavior.

Intelligence and Creativity (2001, 30 min, IM). Being smart and being creative seem to go hand in hand. Or do they? The similarities and differences between intelligence and creativity are examined.

IQ and the Pressure to Perform (2000, 50 min, FHS). The media message these days is a frightening one: The first three years of life are crucial to intellectual development, choosing the wrong school can spell disaster for your child, and cognitive stimulation needs to be present at all times. This video examines the myths and realities behind such claims.

Memory Masters: How Savants Store Information (2006, 53 min, FHS). The cognitive skills of people with savant syndrome are indeed impressive, ranging from recall of dates and facts to the performance of astonishing calculations. This video presents an overview of savants, including interviews with several well-known people who have savant syndrome.

Minor Keys (2004, 53 min, IM). Child prodigies are an intriguing bunch—the violin players and the math whizzes and of course the general smarty-pantsers. This video interviews a former child prodigy (still smart, just not a child anymore!) in its search for the origins of prodigiousness.
Nature and Nurture: Heredity and Environment (2003, 30 min, IM). The focus here is on a general overview of the contributions of nature and nurture to many types of behavior. Applications to the study of intelligence and its origins can be made.

The Search for Intelligence (2006, 30 min, IM). Many different theories of intelligence are trotted out for review in this video. Should a “one size fits all” model still prevail?

Smarter than the Rest of Us (2004, 46 min, IM). Who is it? Who says? Why? Who and where are those who are smarter than the rest of us, and how do we know?

Touched by Genius: A Neurological Look at Creativity (2007, 50 min, FHS). Extraordinary musical ability is often correlated with certain unlikely other mental qualities, autism and Tourette’s syndrome among them. How can this be? This video explores the neurological basis of these abilities in search of an answer.

Due to loss of formatting, Handouts are only available in PDF format.