

**Comment on the Relationship
Between Intelligence, Judgment and Success**

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OVERVIEW

Although a retired financial analyst, I have long had an interest in the relationship between INTELLIGENCE / SAT / IQ / JUDGMENT and SUCCESS. Given those five ingredients, of course, the topic of GENIUS lies right around the corner.

Because of these interests, I have recently completed a paper with the ambitious title: “Comment on the Relationship between Intelligence, Judgment and Success.” Admittedly the essay covers a lot of ground -- a potpourri, really, that hopefully contains a few nuggets of insight. In any event, it could be worth reading just for the commentaries it includes by other observers on the subject such as Cardinal John Newman (on judgment), Howard Gardner (on intelligence) and William Benet (on genius).

Meanwhile, some might interpret this essay as an attack on the SAT/IQ testing paradigm per se. It really is not because I am sure that such tests have value and a place in the overall attempt to capture some important dimensions of mental ability. What I am concerned about, rather, is that they are considered by many to be the “gold standard” in terms of assessing a person’s intellectual and personal skills -- while in fact they are just one of many useful yardsticks for assessing an individual’s ability.

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Comment on the Relationship Between Intelligence, Judgment and Success

Introduction

We begin this essay with the following observation on the Internet describing a nationally recognized preparatory school that is located in northern Alabama:

Indian Springs School is nationally and internationally known for its academic excellence. Our graduates have gained the skills, knowledge and personal strengths that enable them to do outstanding work at colleges all over the country. **We do not expect every student to be a genius**, but we do expect our students to be interested in school work and motivated to perform well.

No doubt the above reference to “genius” is a tongue in cheek remark. Still, as it turns out, the average SAT score for seniors at Indian Springs School was 652 in 2007 – which ranks the entire class among the top 1% of SAT examinees. And bear in mind that Mensa only requires its members to score among the top 2% of the population on an IQ exam.

But there is another side to the SAT/IQ/GENIUS paradigm that we want to examine. Thus, to put the matter of genius in perspective, we have only to consider Howard Gardner’s salient remark: “*There is no test for genius except the judgment of history.*” We might also want to consider the career of William Sidis who had the highest IQ score (250) ever recorded. In an essay on genius by William Benet, we learn that Sidis spoke forty languages and graduated from Harvard at 16. After teaching briefly at Rice University he quit and “for the rest of his life wandered from one menial job to another.”

In light of the above, it is unfortunate that IQ/SAT are deemed by virtually everyone to be the best single measure a child’s potential (and/or “intelligence”) to achieve good grades in school, high occupational status and a robust income, on the one hand, while they are so loosely correlated with these traits for *individuals* -- with the exception of singling out those who are very dull or very bright; especially in memory and/or learning ability. Even at those extremes (within the top or bottom 10%) there are exceptions. Nonetheless, a bottom decile IQ/SAT individual is very *unlikely* to end up the top decile on grades, status or income; nor is a top decile IQ/SAT person *likely* to end in the bottom decile on these conventional measures of “success.”

Clearly, it is not enough to predict the success of anyone (monetarily or professionally) by such limited metrics as SAT/IQ with their emphasis on memory, knowledge and abstract reasoning ability. The exceptions are profound. It is only necessary to enumerate other traits that contribute to success. For example: tenacity, ambition, creativity, originality, self-confidence, self-esteem, curiosity, insight, talent, inventiveness, courage, entrepreneurial ability, managerial/leadership skills and finally that crown jewel of mental ability: good judgment.

It is unacceptable, moreover, to allow judgment to be confused with that more popular trait (which is a good one to have): common sense. Thus, by “judgment” we are referring to the ability to seize the strong point in any argument, as characterized by John Newman in “On the Scope and Nature of a University Education.”

More specifically, it is the ability to digest Insufficient Data, Conflicting Information (or the sparseness thereof), Strong Division of Opinions (frequently among the experts), Vested Interests (including one’s own), all implying Dire Consequences if the wrong decision is made in the face of Chronic Uncertainty. Given these conditions a person of outstanding judgment makes the right decision about 2/3 of the time.

It is the reason, for example, that the CEO or chairman of a company like IBM, Microsoft, Exxon, or General Electric is the rarest of birds and the marketplace puts a high premium on the compensation such leaders receive—supply and demand is working overtime in their selection.

Likewise, there are many Nobel laureates working for major corporations of which they would be the “last” choice to be given the helm by a responsible Board of Directors. Also it is no accident that the man who actually runs Google is not one of its multi-billionaire founders.

To summarize: many things affect whether an individual will soar – even more so if he will join the top 10 percent! We have only to consider socio-economic factors like neighborhood, education, income, profession and marital status of one’s parents-- not to mention gender and race which can burden applicants with historical and ongoing negative experiences.

Role of Genetics versus Nurturing

To extend the above comments a bit further, it would clearly be desirable if everyone could go to Harvard, Princeton or Yale, earn straight A's and become millionaire doctors, lawyers, physicists or engineers. But that will never happen -- even for siblings where the accident of "class and nurturing" do not arise. In this regard, one need only consider the diminutive brothers of Clinton, Reagan, Johnson, Carter and Nixon to realize how fallible "equality of nurturing" can be as a determinant of either intelligence or success. Meanwhile, the influence of genetics on both intelligence and success has often been demonstrated in studies showing the similar performance of genetically identical twins reared apart.

At still another level of interest, we might wish that every student could receive an education allowing him/her to become a Newton, Jefferson, or Shakespeare. Likewise isn't it woefully unrealistic to suggest that Newton himself could have become a Jefferson, or a Mozart, if only he had been raised in the right environment with the appropriate nurturing?

These examples strongly suggest that the dominant determinants of mental development are ingrained attributes in the genetic/molecular structure and chemical balances within the innate birth-brain prescribed at conception and formulated before birth. Thus properly considered *innate intelligence can be construed as the maximum potential a brain possesses at birth* to eventually perform tasks conventionally associated with the numerous and diverse attributes of intelligence. Admittedly this is an abstract, and perhaps impractical, concept.

Nonetheless, it is clear that traditional IQ and SAT tests, which are highly correlated, seek to measure the brain's innate potential for performing a myriad of distinct mental activities by focusing on an extremely narrow set of abilities under highly unrealistic conditions -- e.g., only one correct answer to any question, or just 90 seconds to decide. The premium on memory skills is enormous. As often noted regarding the fairness of college admissions, a key problem with such tests is their assumption that each student has had the same opportunity, and motivation, to develop his/her innate brain power before taking the test and that the mental attributes the tests examine, and how they are structured and administered, are the appropriate ones for sorting college admissions optimally.

Presumably, the core objective is to find the best innate/genetic brain power among applicants with the motivation to use it. If the tests are successful, such students will be selected for the best colleges and programmed with the best instructions (a thorough base of knowledge and the thinking/analytical ability to use it) while others will find their appropriate place within the pecking order of less demanding colleges and jobs. In an ideal world, of course, this also assumes that everyone can afford to go to the best college that will accept them and that external influences ("noise" attributable to one's socio-economic status, etc.) can be accounted for. A very tall order indeed.

Be that as it may, it is no excuse for denying that bedrock differences in innate/genetic intelligence exist and have a profound impact on one's performance in modern society. Meanwhile, circumstances today are quite unlike the situation in 20,000 BC when the spectrum of innate differences in human brain power were just as disparate as now but without a base of scientific knowledge to make these differences apparent. Thus the social pecking order was largely determined by brute strength and tribal leadership ability -- analogous to children left unattended in the forest.

First Among Primates

Interestingly enough, most of us are either closer to the chimpanzee in mental ability than we realize or further away from real genius than we care to believe. Still, in relation to chimpanzees every human has a touch of brilliance. This is due to his having access to the moving historical record that survives and grows with each generation. It is due to one's speaking and writing ability copied from whatever region he happens to have grown up in. And it is due to his ability to assimilate general knowledge/information -- a talent that is exploited ruthlessly through unending education sometimes requiring 22 years, out of a 70 year lifespan.

Next consider the substantial skeletal changes required for permanent upright walking by early “man” five million years ago, and “Lucy” two million years later. Nonetheless, both animals possessed the 450cc brainpower of a chimpanzee. Over the next few million years these critters developed other uniquely-human characteristics. Most importantly: a powerful 1200cc brain, an exceptional voice-box and a *completely opposable* thumb permitting precise manipulation of materials for producing the artistic, mechanical and technological marvels that abundantly demonstrate how extraordinary a species humans are.

Still in all, if innate brainpower (e.g., Sally's *potential* at birth, with optimal nurturing in childhood, to exhibit artistic, commercial, political or scientific ability due to insight, reasoning, judgment, creativity, etc.) were as *evenly distributed* across humans as is the ability to walk upright, speak our parent's native tongue, or copy our parent's alphabet, then space travelers coming to earth within the last 50,000 years might have wired back to the mother ship, “just some furry primates and quite a few lesser life forms down here.”

Fortunately for mankind, however, every so often a human brain gets miraculously wired and results in an innately brilliant mind, such as a Newton, Edison, Dostoevsky or Churchill -- greatly amplifying the gulf between man and his primate cousins. Meanwhile, if we humans still had the hands of our hirsute relative, the chimpanzee, and had not developed a fully opposable thumb the stone age might lie in our future, not in our past!

The Role of Technology

Innate, as well as educational, differences in mental ability are as widely dispersed as the components inside a computer. Education, in effect, is the software the “computer” is armed with. In humans this can take only a few years or up to twenty years (depending on one’s ambition and professional goals) to install. Each “PC” has a unique CPU (vintage 8088 or a state of the art Pentium 5). Differences are widespread in the memory hardware as well (64 kilobytes of RAM or 2 gigabytes); and eventually long-term memory capacity comes into play (a 10 megabyte hard drive or a 200 gigabyte churn).

Looking back, recall that it took Homo sapiens several hundred thousand years to traverse the stone age and enter the bronze age, about 5,000 years ago. But thanks to computers, and other technical advances, he may yet extend his habitat to another planet. Thus, Table 1 on the following page examines mankind’s potential for material and/or technical development through the prism of compound growth and time, as it may affect the nation’s output in a mere 1000 years. Just consider implications of the table below:

Table 1			
Terminal Multipliers for Any Starting Amount			
Future Value for a unit of 1 Given Various Compound Annual Growth Rates (Projections of 2.0%, 2.5%, 3.0%, and 3.5% Growth Are for 1000 Years)			
<u>Rate of Growth</u>			<u>Number of Doublings in 1000 Years</u>
<u>3.5% Compound Growth</u>			48.6
871,665,370,998,637	1.035^{1000}		
872 TRILLION			
<u>3.0% Compound Growth</u>			41.7
6,874,240,231,170	1.03^{1000}		
7 Trillion			
<u>2.5% Compound Growth</u>			34.7
52,949,930,179	1.025^{1000}		
53 Billion			
<u>2.0% Compound Growth</u>			27.8
398,264,652	1.02^{1000}		
398 Million			

Meanwhile, Moore's law which refers to the *doubling* of computer chip capacity every 18 months implies a 59% compound annual rate of growth . The law has been more or less vindicated since it was first proclaimed three decades ago. Many experts believe it has long legs and quite a distance to run before losing momentum and dropping to, say, a "modest" 10% compound annual rate.

But now we have an update, from an article that appeared in a recent issue of The New York Times:

The world's largest chip maker, has overhauled the basic building block of the information age, paving the way for a new generation of faster and more energy-efficient processors. Company researchers said the advance represented the most significant change in the materials used to manufacture silicon chips since Intel pioneered the modern integrated-circuit transistor more than four decades ago...The Intel announcement is new evidence that the chip maker is maintaining the pace of Moore's Law,

the technology axiom that states that the number of transistors on a chip doubles roughly every two years, giving rise to a constant escalation of computing power at lower costs....

The chip industry measures its progress by manufacturing standards defined by a width of one of the smallest features of a transistor for each generation. Currently much of the industry is building chips in what is known as 90-nanometer technology. At that scale, about 1,000 transistors would fit in the width of a human hair. Now the company is moving on to the next stage of refinement, defined by a minimum feature size of 45 nanometers. Other researchers have recently reported progress on molecular computing technologies that could reduce the scale even further by the end of the decade.

* * *

Giving IQ Its Due

Although far from perfect, it's clear that IQ/SAT scores are enormously useful in separating the "wheat from the chaff" insofar as mental ability is concerned. Certainly Harvard, Chicago, Yale, Princeton and Stanford have graduated a few "failures" over the years, but their student bodies (flush with IQ/SAT credentials) have produced a vastly disproportionate share of Americans who have excelled by almost every conventional standard of professional success. Of course, a high IQ/SAT passport does not insure one is going to hit a home run, but it certainly puts the right candidates for doing so on the playing field – namely an Ivy League University with the best teachers money and prestige can hire; which is most of them.

The principal justification for an IQ/SAT standard for admissions is that it is so difficult to identify 18 year olds with the critical, but non-testable, attributes that are major contributors to success such as tenacity, ambition, creativity, originality, self-confidence, self-esteem, managerial and leadership skills, curiosity, insight, inventiveness, wisdom and *good judgment*. Thus, admission officers by default fall back on IQ/SAT's testable characteristics such as abstract reasoning ability, memory, knowledge and speed in comprehension that are the hallmarks of those type of pencil and paper, clock on the wall, one correct answer, exams. They just happen to be meaningfully correlated with *learning ability* as well.

Moreover, much of our earlier questioning of IQ/SAT can be second-guessed if one embraces the controversial concept of the "g factor" that asserts IQ/SAT (as restricted as those tests are in the traits of mental ability they examine, and how they go about it) are able to capture a pervasive *general intelligence* that spans all the characteristics of "brainpower" the tests do not measure directly. (Howard Gardner, on the other hand, has made one of the strongest cases against using a single number to quantify mental ability with his theory of "multiple intelligences" – see below.)

Still, the Japanese, who have a remarkably successful industrial juggernaut under their belts, do not horse around with second-guessing IQ/SAT attributes. Those are the qualities they pursue, almost exclusively, in college admissions.

Indeed, no system is perfect. For example, it has often been observed that American democracy is a flawed system of government. It can easily produce “leaders” who are virtually dysfunctional. It results in laws that are often absurd. Federalism is in tatters. The Supreme Court is omnipotent. The Electoral College is an aberration. The Senate is chronically lopsided with senators from states with 0.5 million inhabitants on an equal footing with those having 30 million. Ten past Presidents (in the land of the FREE) were slave owners -- the Declaration of Independence, Bill of Rights and Constitution notwithstanding. The simple, but compelling answer to all of this is simply that democracy is *resilient* and far better than any alternative history has churned up after centuries of experimentation.

Likewise, free-market capitalism (however productive) is one of the cruelest, most merciless, economic systems on earth. Still, it was entirely consistent with American values until the depression and President Roosevelt came along. Then President Johnson gave the economy another huge shove toward socialist principals which is the method for organizing the economy that Einstein endorsed -- see his essay, “Why Socialism.”

We’ll round out these caveats by quoting Howard Gardner’s enormously abstract definition of intelligence which in slightly abridged form is the following: Intelligence is the ability to solve *problems* and/or to create products that people will pay for -- or at least admire.

* * *

Bertrand Russell’s Exam as Precursor to the College Board

As Russell noted in his autobiography:

Wittgenstein had intended to become an engineer and for that purpose had gone to Manchester. Through reading mathematics he had become interested in the principals of mathematics, and asked who there was that worked at this subject. Somebody mentioned my name, and he took up residence at Trinity.

At the end of his first term at Trinity, he came to me and said: “Do you think I am an absolute idiot?”...I said to him: “*My dear fellow, I don't know if you are an idiot or not, but if you will write me an essay during the vacation upon any philosophical subject that interests you, I will read it and tell you*”. He did so and brought it to me at the beginning of the next term. As soon as I had read the first sentence I became persuaded that he was a man of genius...

Wittgenstein had become an officer in the Austrian army... It appeared he had written a book in the trenches, and wished me to read it. He was the kind of man who would never have thought about bursting shells when he was thinking about logic. He sent me a manuscript of the book which was subsequently published under the title *Tractatus Logico Philosophicus*...

* * *

Or as Debbie Fleming recently observed in *ABOUT*:

The SAT is now a three-part test instead of a two-part, with a perfect score of 2400 instead of 1600. The writing section itself lasts 60 minutes, with a multiple choice section lasting 35 minutes and an essay- writing portion of 25 minutes.

Worried About the Time Requirement?

As mentioned above, the essay-writing portion is a timed test, allowing students *25 minutes* to plan, outline, and write. The problem is, some students are so concerned about the clock that they skip over the planning and outlining and dive straight into writing. Don't make this mistake! For most people it's a good idea to jot down ideas and important points before starting. [Consider the following example:]

Many persons believe that to move up the ladder of *success and achievement*, they must forget the past, repress it, and relinquish it. But others have just the opposite view. They see old memories as a chance to reckon with the past and integrate past and present.

—Adapted from Sara Lawrence-Lightfoot

Assignment: Do memories hinder or help people in their effort to learn from the past and succeed in the present? Plan and write an essay in which you develop your point of view on this issue. Support your position with reasoning and examples taken from your reading, studies, experience, or observations

No comment – too controversial!

* * *

According to John Henry Newman ("On The Scope and Nature of a University Education") the essence of judgment is the ability to seize the strong point in ANY argument. In "The People's Questions" recently published in The New York Times, *the people* wanted Barack and Hillary to tell them in 90 seconds or less where they stand on the abolition of nuclear weapons, the establishment of long term military bases in Iraq, a

cure for the nations chronically low savings rate, cessation of ethanol production, the names of three good candidates for seven cabinet positions, mandated health insurance, abortion and stem cell research. Why 90 seconds? Why not just a "yes" or "no" answer to issues that experts have churned out volumes of analyses on seeking a resolution or solution? Respond and explain in just 90 seconds, please!

Why not just admit that selecting a president is equivalent to choosing a person with enough judgment to run 15 companies in the Dow Jones Industrial Average simultaneously and hoping to be successful in dealing with the chronically uncertain future at least 65% of the time -- which is the most that multi-million dollar executives are able to do. Of course some issues are more important than others but that does not mean they are any less complicated from an analytical or judgmental point of view.

And now, we'll conclude this essay by quoting three experts on the real meaning of judgment and intelligence: John Newman, Howard Gardner and William Benet.

JOHN HENRY NEWMAN ON JUDGMENT (1852)

From: On the Scope and Nature of a University Education

Of the intellectual powers the judgment is that which takes the foremost lead in life. How to form it to the two habits it ought to possess, of exactness and vigour, is the problem. It would be ignorant presumption so much as to hint at any routine of method by which these qualities may with certainty be imparted. Still, however, we may safely lay it down that they are not to be got "by a gatherer of simples," but are the combined essence and extracts of many different things, drawn from much varied reading and discipline first, and observation afterwards.

For if there be a single intelligible point on this it is that a man who has been trained to think upon one subject or for one subject only will never be a good judge even in that one: whereas the enlargement of his circle gives him increased knowledge and power in a rapidly increasing ratio.

So much do ideas act, not as solitary units, but by grouping and combination; and so clearly do all the things that fall within the proper province of the same faculty of the mind intertwine with and support each other. Judgment lives as it were by comparison and discrimination.

To open our way a little further on this matter, we will define what we mean by the power of judgment, and then try to ascertain among what kind of studies the improvement of it may be expected at all.

Judgment does not stand here for a certain homely, useful quality of intellect that guards a person from committing mistakes to the injury of his fortunes or common reputation; but for that master principle of business, literature and talent, which gives him strength in any subject he chooses to grapple with and enables him to *seize the strong point* in it.

Whether this definition be metaphysically correct or not it comes home to the substance of our inquiry. It describes the power that everyone desires to possess when he comes to act in a profession, or elsewhere, and correspond with our best idea of a cultivated mind.

* * *

Howard Gardner and Multiple Intelligences, by Mark K. Smith
From: *The Encyclopedia of Informal Education, 2002*

Howard Gardner has questioned the idea that intelligence is a single entity, that it results from a single factor, and that it can be measured simply via IQ tests..... Gardner viewed intelligence as 'the capacity to solve problems or to fashion products that are valued in one or more cultural setting' (Gardner & Hatch, 1989)....

Gardner initially formulated a list of seven intelligences. His listing was provisional. The first two are ones that have been typically valued in schools; the next three are usually associated with the arts; and the final two are what Howard Gardner called 'personal intelligences.'

Linguistic intelligence involves sensitivity to spoken and written language, the ability to learn languages, and the capacity to use language to accomplish certain goals. This intelligence includes the ability to effectively use language to express oneself rhetorically or poetically; and language as a means to remember information. Writers, poets, lawyers and speakers are among those that Howard Gardner sees as having high linguistic intelligence.

Logical-mathematical intelligence consists of the capacity to analyze problems logically, carry out mathematical operations, and investigate issues scientifically. In Howard Gardner's words, it entails the ability to detect patterns, reason deductively and think logically. This intelligence is most often associated with scientific and mathematical thinking.

Musical intelligence involves skill in the performance, composition, and appreciation of musical patterns. It encompasses the capacity to recognize and compose musical pitches, tones, and rhythms. According to Howard Gardner musical intelligence runs in an almost structural parallel to linguistic intelligence.

Bodily-kinesthetic intelligence entails the potential of using one's whole body or parts of the body to solve problems. It is the ability to use mental abilities to coordinate bodily movements. Howard Gardner sees mental and physical activity as related.

Spatial intelligence involves the potential to recognize and use the patterns of wide space and more confined areas.

Interpersonal intelligence is concerned with the capacity to understand the intentions, motivations and desires of other people. It allows people to work effectively with others. Educators, salespeople, religious and political leaders and counsellors all need a well-developed interpersonal intelligence.

Intrapersonal intelligence entails the capacity to understand oneself, to appreciate one's feelings, fears and motivations. In Howard Gardner's view it involves having an effective working model of ourselves, and to be able to use such information to regulate our lives.

In *Frames of Mind* Howard Gardner treated the personal intelligences 'as a piece'. Because of their close association in most cultures, they are often linked together. However, he still argues that it makes sense to think of two forms of personal intelligence. Gardner claimed that the seven intelligences rarely operate independently. They are used at the same time and tend to complement each other as people develop skills to solve problems.

* * *

Genius: An Overview by William E. Benet, Ph.D., Psy.D.
From Assessment Psychological.com – January 2005

Genius is one of the oldest and yet one of the most elusive concepts in the history of psychology, and also one of the most fascinating. Originally, in Graeco-Roman antiquity, genius referred to a quality that everyone possessed, an animating spirit that represented one's character and interests as much as one's ability. Over time, however, it became increasingly associated with one's natural ability or talent, and eventually with the special ability of a few. Nineteenth century British psychologist Francis Galton, citing British author and lexicographer Dr. Samuel Johnson as a paragon example, described genius as "a man endowed with superior faculties." And then, in the early part of the 20th century, as interest in psychometric methods of assessment grew, genius became associated with a quantitative concept known as the Intelligence Quotient or IQ, which further adulterated its original meaning. Expressed as a ratio score, IQ was the ratio of an individual's estimated mental age and chronological age multiplied by 100. In 1916, Stanford University psychologist Lewis M. Terman, Ph.D., classified an IQ score of 140 or higher as "genius or near genius", a classification that is no longer used. Ironically, one of the first practical applications of IQ tests was to identify children who were mentally handicapped, not gifted. Alfred Binet, the French psychologist who developed The Binet-Simon Intelligence Scale in 1905, which Terman would later revise and use to identify gifted children, was dismayed by this subsequent application of his test. Today, not only have high IQ scores become used to identify children for gifted programs, but in popular parlance have become equated with genius. This is very unfortunate since, as we shall see, the relationship between high IQ scores and genius is not always apparent. In fact, history is full of geniuses who more than likely had ordinary IQs.

Today, Stanford-Binet IQ scores are expressed as deviation quotients based on a normally distributed population with a mean of 100 and a standard deviation of 16. For a normally distributed (bell-shaped) population, a mean of 100 is the point at which a score is equal to or greater than the scores of 50 percent of the population. An average score is generally considered to be any score that falls within one standard deviation above or below the mean (100 +/- 16 or 84-116 on the Stanford-Binet scale and 85-115 on the Wechsler intelligence scales, which have a standard deviation of 15, and are the most commonly used IQ tests today).

.....The word "genius" is derived from the Latin verb "gignere", which means to beget or produce. Historically, genius referred to one's ability to accomplish or create something, something that performance on an IQ test does not measure.

Consider Einstein, for example: as a child, he was delayed in speech and was a poor student who dropped out of school at one point and failed to pass the entrance examination for admission to the Swiss Federal Institute of Technology in Zurich. He was eventually admitted after retaking the examination two years later, and graduated, but was unable to obtain a university teaching position, and went to work instead as an assistant technical clerk in the patent office in Bern, Germany. Einstein was well on his way to what appeared to be an entirely uneventful and undistinguished career.

Einstein's IQ is unknown. It has never been tested, but there is no question that he was one of the greatest geniuses of the 20th century. There have been other geniuses who, if they had been tested, may not have obtained very high scores, or even above average scores, on an IQ test, especially in the arts and literature. It is interesting but idle to speculate how, say, Picasso or Hemingway or any number of artists or writers might have scored. And then there are geniuses in other fields of endeavor, such as sports and entertainment, for whom a discussion of IQ seems completely irrelevant.

Harvard University psychologist Howard Gardner, Ph.D., has identified ten different types of Intelligence. Only two or three types (logical-mathematical, linguistic and spatial intelligence) are commonly represented in contemporary IQ tests. The other seven (musical, bodily-kinesthetic, interpersonal, intrapersonal, naturalist, spiritual and existential intelligence) are generally excluded. Yet, individuals who are gifted in these other areas can have an impact on society that inspires, uplifts, transforms, or simply entertains, which is no less important than the highest achievements in the areas of ability that are measured by most IQ tests. Genius, as Gardner suggests, can manifest itself in other ways besides a high IQ score. And a high IQ score is by no means a guarantor of success and accomplishment in life. Consider William James Sidis, who reportedly had the highest IQ in history.

The story of Sidis, whose IQ was estimated to be over 250, was, by every account, phenomenally gifted. Grady M. Towers, in an article in *Gift of Fire* (the journal of the Prometheus Society), wrote that at eighteen months Sidis could read *The New York Times*, at two he taught himself Latin, and at three he learned Greek. By the time he was an adult, he could speak more than forty languages and dialects. He graduated from

Harvard cum laude at sixteen, and became the youngest professor in history at Rice University. Towers wrote, "Of all the prodigies for which there are records, his was probably the most powerful intellect of all. And yet it all came to nothing. He soon gave up his position as a professor, and for the rest of his life wandered from one menial job to another."

In a study by Columbia Teacher's College psychologist Leta S. Hollingworth, Ph.D., *Children Above 180 IQ* (1942), she concluded that there was an IQ range of optimum productivity and personal adjustment between 125 and 155. Scores in this range are typical of the scores obtained by U.S. school children who are referred by their teachers for gifted education programs. The cutoff for eligibility in some states is an IQ score that is among the top two percent of the population, which is a score of 130 on the Wechsler scales (or 132 on the Stanford-Binet scale). But it is not always the sole criterion. Just as importantly, superior academic achievement and interests that foster achievement are often considered in making a final determination for gifted program placement. While this process is commendable for recognizing that IQ is only one facet of giftedness, it is not without controversy for failing to recognize the many gifted, ambitious, and motivated children scoring below the cutoff who would also benefit from an enriched curriculum and the emotional trauma for those children who are not accepted.

I am often asked by children, whom I evaluate for gifted programs, and their parents, what is a "genius IQ score?" And I tell them, quite matter of factly, there is none. Genius is what one accomplishes in life, not the score one makes on a test of mental ability. As a practical guideline, I advise parents, who are typically more concerned than their children about what their scores mean, that any child that scores around 115 (or higher than two thirds of their peers) has the general intellectual ability to succeed in virtually any endeavor that is accompanied by interest and application. University of California at Berkley educational psychologist Arthur Jensen, Ph.D., wrote that beyond one standard deviation above the mean (an IQ score of around 115), "the IQ level becomes relatively unimportant in terms of ordinary occupational aspirations and criteria of success.

For those who score higher than this, the only limitations are drive and desire plus the ability to initiate and carry out tasks or simply the ability to get things done. Drive and desire cannot be overstressed. There are many stories of geniuses with extremely high IQs who also had a burning desire to achieve. American chess genius and former world champion, Bobby Fischer, "lived and breathed chess." No one worked harder at mastering the game than Fischer, even though his reported IQ of 187, was among the highest in history; but, unfortunately, like Sidis, Fischer represented one of the sadder chapters in the annals of American geniuses. Plagued by inner demons, Fischer completely withdrew from competition after winning the world championship in 1972 at the age of 28 and has accomplished nothing significant since then. On the other end of the IQ spectrum was one of America's greatest inventive geniuses: Thomas Alva Edison. Like Einstein, he was not a very good student, and quite likely would not have scored very high on an IQ test in childhood. But Edison, like all geniuses of great

accomplishment, had boundless drive, and understood perfectly the essence of genius when he wrote, "Genius is one percent inspiration and 98 percent perspiration."

What then are some of the more meaningful uses IQ scores? IQ testing is one of the most precise psychometric methods used by psychologists for assessing individual differences in general intellectual ability and is extremely useful for assessing academic aptitude. In clinical settings, cognitive testing is indispensable in assessing a wide range of neuropsychological deficits resulting from such disorders as stroke, Alzheimer's disease, and closed head trauma. These deficits may be sudden or gradual and progressive, and cannot be as precisely measured by other means, such as CT or MRI scans or lab tests as well as psychometric means. IQ testing is extremely useful in accurately assessing and identifying children who are mentally handicapped as well as gifted. They are also useful in occupational screening and have been used by the U.S. Armed Forces since WWI for screening and classifying recruits for job assignments.

Where IQ tests are less useful is in making meaningful distinctions between different IQ levels at the extremes of ability, both above and below the mean, but especially the former. This is due in part to the decreasing discrimination between subtest scale scores at the extremes of performance. For example, on the Vocabulary subtest of the Wechsler Intelligence Scale for Children-III, (this subtest correlates more strongly with overall intellectual ability than the other 12 subtests), the raw score difference between a scale score of 10 and 13, which represents a one standard deviation difference, is 7-10 points for a 16-year old; while the difference between a scale score of 16 and 19, which is also a one standard deviation difference, but two to three standard deviations above the mean, is only three points. Correct responses on the Vocabulary subtest are scored as either one or two points, depending on the quality of the response. Using Wechsler's system of classification, the difference between Average and High Average intelligence on this subtest may reflect a difference of as much as 5-10 correct responses; while the difference between Superior and Very Superior intelligence may reflect a difference of only two correct responses. The latter is hardly a substantial difference, and at the higher levels of IQ, not a particularly meaningful one.

We can conclude, by once again quoting Jensen, who wrote, "That is not to say that there are not real differences between the intellectual capabilities represented by IQs of 115 and 150 or even between IQs of 150 and 180. But IQ differences in this upper part of the scale have far less personal implications than the thresholds just described and are generally of lesser importance for success in the popular sense than are certain traits of personality and character."

* * *

Please scroll down.

WAIS CLASSIFICATION, descriptions, High-IQ societies, v = "here and down" Lennon	%ile in the general population	standard deviation	IQ	SD-15 - WAIS, WISC	SD=16 - Binet, CTMM, Otis-						
PROFOUND RETARD.---v (Verbal)	.13e-8		00	-07	IQ SD-23.7 - Cattell						
SEVERE RETARD.-----v	.29e-4	-5.00	25	20	SAT Verbal						
MODERATE RETARD.---v	.0031	-4.00	40	36	GRE Verbal						
MILD RETARD.-----v Analogies	.13	-3.00	55	52	Miller						
BORDERLINE RETARD.-v Verbal+Math	2.3	-2.00	70	68	SAT (old)						
DULL-NORMAL-----v Composite**	9.1	-1.33	80	79	ACT						
AVERAGE-----v	25.0	-0.68	90	89							
general pop. ave.---	50.0	0.00	100	100	100	340					
high sch. grad ave.	60.0	+0.25	104	104	106	370			790	19	
	70.0	0.53	108	108	112	410			860	21	
BRIGHT-NORMAL-----v	75.0	0.68	110	111	116	430			910	22	
	80.0	0.83	112	113	120	450	420		940		
college grad ave.---	84.1	1.00	115	116	124	470	440	38	980	23	
	90.0	1.29	119	120	130	500	470	43	1040	24	
SUPERIOR-----v	91.0	1.33	120	121	132	510	480	44	1060	25	
	93.0	1.47	121	122	135	530	500	47	1100	26	
Ph.D. & M.D. ave.---	95.0	1.63	125	126	139	550	530	52	1150	27	
	97.0	1.87	128	130	145	580	580	60	1190	28	
VERY SUPERIOR-----v	97.8	2.00	130	132	147	590	600	65	1220		
Mensa, Camelopard-v	98.0	2.06	131	133	149	600	610	66	1230	29	
Intertel, TOPS-----v	99.0	2.33	135	137	155	640	670	74	1310	31	
Poetic Genius-----v	99.5	2.57	139	141	161	670	710	81	1360	32	
	99.7	2.74	141	144	165	690	730	84	1390		
	99.8	2.88	143	146	168	710	740	86	1420	33	
ISPE-----v	99.9	3.09	146	149	173	730	760	89	1450	34	
	99.95	3.29	149	153	178	750	780	91	1480	35	
	99.97	3.43	151	155	182	760	790	92	1500		
WAIS-III ceiling	99.98	3.54	153	157	184	770	800	93	1510		
(IQ 155)	99.99	3.73	156	159	188	780		94	1530		
	99.995	3.90	158	162	192	790		95	1540		
Prometheus-----v	99.997	4.02	160	164	195	800		96	1550		
	99.998	4.10	162	166	197			97	1560		
	99.999	4.27	164	168	201			98	1570		
	99.9995	4.42	166	171	205				1580		
	99.9997	4.53	168	172	207						
	99.9998	4.61	169	174	209				1590		
Mega-----v	99.9999	4.75	171	178	212				1600	36	
	99.99995	4.89	173	178	216						
	99.99997	5.00	175	180	218						
	99.99998	5.07	176	181	220						
	99.99999	5.20	178	183	223						
	99.999995	5.33	180	185	226						
	99.999997	5.42	181	187	228						
	99.999998	5.50	182	188	230						
	99.999999	5.61	184	190	233						
	99.9999995	5.73	186	192	236						
	99.9999997	5.82	187	193	238						
	99.9999998	5.88	188	194	239						
	99.9999999	6.00	190	196	242						