

"Will A Real Genius Please Step Forward"

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WILL A REAL GENIUS PLEASE STEP FORWARD...

Like most people, I have always wondered how some people that never study make high SAT and LSAT scores, how the bottom half of each high school class seems to rule the world, and how some people who never go to class make A's by memorizing the book the night before the test. Also, I have always wondered why a society that readily recognizes that not everyone can dunk a basketball, persists in believing that everyone is intellectually equal. All of these questions were recently brought into focus when a friend of my son was described "as the most intelligent kid in the class, almost a genius". This observation immediately caused me to rethink my understanding of what constitutes intelligence and genius. Heck, I know this kid. Upon further study, I soon realized that others shared my confusion. Based upon my study, I would like to share my observations with you on the overall issue of intelligence.

Narrowing the study, several basic but intertwined questions emerged:

- How is intelligence defined?
- Can intelligence be measured?
- Are IQ tests a valid indicator of intelligence?
- Using IQ tests, what are the major characteristics of intelligence? and,
- How is genius defined?

Although this paper is going to stay clear of any physiological explanation, research indicates that the larger the brain the more intelligent the individual. This conclusion is based upon the increasing brain size of different societies and the improvement of those societies on standardized tests. For whatever reason, one's brain size and ability to process electrical impulses indicate an increased likelihood that "culture-fair" questions will be answered more quickly and accurately. As science attempts to understand the "vectors of our mind", there appears to be more than a coincidence that the nueral mass of Einstein's brain was five times as dense than the average brain. In what will probably conclude with a Nobel Prize, considerable effort is being devoted to discovering the degree to which brain structure is related to mental activity and which parts of the brain are associated with which mental functions. However, until further research clarifies certain conflicting information, no one really knows for sure. What scientists do know is that some people simply have the ability to process information faster and more accurately than others.

Ignoring a physiological definition, how can intelligence be defined? David Wechsler, a leading researcher, defines intelligence as:

...the aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment. It is aggregate or global because it is composed of elements or abilities which, though not entirely independent, are qualitatively differential.

Simply put, the realization that many different elements compose intelligence is crucial. Although one may be described as smart, precocious, an able learner, gifted, talented, brilliant, or even as a genius, each individual performs at different levels depending upon which element is being measured. Some tests, such as one designed by J. P. Guilford, measures 120 elements, whereas the more popular WISC-R test measures 31 factors. Depending upon the test being used, "intelligence" is defined as reasoning ability, whether cognitive, abstract, spatio-visual, or quantitative.

A good example of a classic reasoning problem is:

If Sally's daughter is my son's mother, what relationship am I to Sally if I am male? (Sally's son-in-law);

How many odd pages are there in a book 479 pages long? (240--85%); or,

How far can a dog run into the woods? (half-way)

However, other researchers define intelligence as more than a high level of reasoning ability. They believe intelligence includes abilities encompassing music, performing arts, athletic, interpersonal, linguistic, logical, mathematical, interpersonal, and intrapersonal. MENSA, the international society comprising the top 2% of the general population as measured by IQ tests, looks for the ability to solve vocabulary, analogy, math, logic, trivia, and classic problems.

One of the leading contemporary researchers, Robert Sternberg, defines intelligence as one's ability to be creative by relating and connecting information. To Sternberg, intelligence is more than processing information quickly and efficiently, it is the ability to adapt to one's environment. This involves the ability to concentrate on the really valuable information, putting the facts together and getting the big picture, and seeing old information in a new light. Although difficult to measure, it is this type of "adaptive ability" that produces the likes of a Jeb Stuart, Winston Churchill, Adolph Rupp, or Bear Bryant. Also,

intelligence is more than a formal education, i.e., the acquisition of information as measured by educational degrees. To many people, intelligence is street smarts, the ability to relate things--objects, people, events, and circumstances--to other things. More than the facts involved, it is the way those facts are used that are crucial.

However, perhaps the most measurable definition of intelligence was put forth by Spearman, who identified it as three basic factors. One is a general intellectual factor identified as "g" that is synonymous with reasoning ability. The second is comprised of two specific factors he identified as either verbal or visuospatial, e.g., the ability to imagine what an object looks like if rotated in space. The third factor includes a long list of specific or primary abilities like memory, music, and mathematical. By analogy, "g" would be the strongest thread of a rope and with one's special abilities intertwining to strengthen the rope. Whatever its composition, it is now clear that those who make high scores on one test will tend to make high scores on other tests, and the same being true for those who make low scores. Regardless of the element being measured, each individual has some level of intellectual ability that is transferable to other and unrelated intellectual tasks.

Despite much criticism, there is "nothing on the horizon" that provides a better indicator of a person's overall general intelligence than IQ tests. IQ tests are continually criticized as culturally biased, as providing an unfair advantage to members of affluent households, and for not really measuring anything that can be called intelligence. At least in some eyes, IQ scores provide an unfortunate reminder that we are of unequal mental ability and that we are not all created equal. However, as emphasized by Arthur Jensen, an IQ score is not a measure of human worth but is simply an indicator of a person's ability to process data effectively. Also, although IQ scores remain the best predictor of academic success they are often poor predictors of job success.

Developed by Alfred Binet in 1905, Binet correctly assumed that a person's intellectual ability could be measured and that it increased progressively with age. Using the first IQ test, Binet was able to accurately identify the slow learners in Paris' elementary schools and to predict their future school performance. Although Binet correctly predicted that increases in intellectual levels increase with chronological age, continued intellectual growth appears to cease between the ages of 20-25. It is for this reason that, all things being equal, a person's IQ should remain constant with those of a similar age. Depressingly, the brain typically loses about 6% of its weight between the ages of 20 and 65, and raw scores are about 15% lower.

Although a person's IQ may change five points either way if the test is retaken, IQ tests provide a good indicator of a person's "g" factor and allow credible assumptions concerning the intelligence of society as a whole.

With reasonable certainty the intelligence range and distribution of a society can be summarized as follows:

CLASSIFICATION	IQ SCORE	% OF POPULATION
Defective	< 69	2.2
Borderline	70-79	6.7
Dull-Normal	80-89	16.1
Average	90-109	50
Bright-Normal	110-119	16.1
Superior	120-129	6.7
Very Superior	> 130	2.2

Concerning intelligence, perhaps the greatest question is whether it is a result of nature (genetics) or nurture (environment). Objectively, the argument that environment totally controls one's intelligence has merit only if two factors can be believed. One, that the only human organ not influenced by one's parents is the brain, and two, that the brain does not govern intelligence. In attempting to answer this question, studies have tracked adopted children, twins raised together, and twins raised apart. Numerous and interesting, such studies indicate that that intelligence is between 60 and 70 percent, i.e., "substantially determined", by genetics.

Also, a statistical phenomenon called regression to the mean provides additional support that genetics controls over environment. Based upon the law of large numbers, the children of above-average parents will have IQ's somewhat below their parents but above the general population, and likewise for children of less intelligent parents. Presently, science lacks the ability to positively predict the IQ of a particular child, but can predict that the score should be within 13 points below the parents' average IQ.

Another basic question is whether one's IQ can be improved. The answer appears to be yes, and one either uses his intellectual ability or he loses it. Studies indicate that the greater time spent in school, regardless of the type of schooling, slightly raises one's IQ and overall thinking and problem-solving skills. Conversely, IQ scores drop for those students who start school late, drop out early, or intermittently attend school. Further, a comparison of IQ scores since 1952 involving students from 14 different countries indicates that IQ scores are rising. Arguably, increased nutrition, television, and student's experience in taking the tests have been attributed to the increase. Additional studies indicate that when today's high school

students take the same SAT tests that were given in the 1930's and 1940's, today's students score higher. However, such data indicates two novel possibilities. One, intelligence is generationally oriented, and two, IQ tests should not be used to compare different cultures. Arguably, one would expect a world of increasing IQ's to produce a greater number of geniuses. Ironically, this does not appear to be the case. What does appear to have occurred is that the intergenerational IQ gains have mostly occurred in the lower half of the IQ distribution.

Overall, although a greater percentage of the world's population has been intellectually stimulated than ever before, it unfortunately is not the type that has translated into higher-level reasoning abilities. Although the lower half of the IQ scale has benefited, it apparently was due in part to some slippage at the top. In what some researchers call "mediocritization", the IQ scores are beginning to cluster around the middle. Initially, this may sound like good news, i.e. a smarter overall population, but this may not be the case. Historically, the contributions made by the top 1% are incalculably more valuable to society as a whole than the contributions by the bottom 50%. At least for educated Americans, "mediocritization" will in all likelihood lead to a much less interesting life.

Surprisingly, the structure of intelligence is different among races and nationalities. East Asians repeatedly test above average and have translated their greater intelligence into economic success. After comparing the test results taken by American and Chinese students, a strong argument can be made that Chinese students are inherently brighter than their American counterparts. Similarly, the general rule is that Japanese students excel in math and science but are much weaker in the verbal sphere. In addition, the IQ's in Japan are not as variable as in the United States, i.e., the scores are more clustered near the mean. The significance is that about 25% of the workers in the United States have IQ's under 90 and only 15% in Japan. Arguably, Japan outperforms American workers in large part because it uses workers with a greater percentage of more intelligent workers. Also, American blacks on average score 15-18 points lower than American whites. It would appear that the reason blacks are under represented in complex occupations is not due to racial discrimination but to ~~the~~ lower "g" scores and an inability to perform the work.

Concerning IQ and productivity, it is clear that high-IQ people do well in the world. When IQ tests taken by over 29,000 New York police officers were reviewed 50 years later, a Harvard study concluded:

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Rank in the police force, income, and social status were among the variables correlated with test scores. Neither background, family status nor the individual's own educational history was as predictive of success as the score earned on a 3 1/2 hour test taken over half a century earlier.

In a free market economy, regardless of the task being performed, differences in intelligence among workers creates pressure to segregate work tasks by the degree of intellectual complexity. Eventually, an occupational hierarchy emerges. Studies continue to indicate that most occupations are filled within identifiable IQ ranges and the best indicator of success is intelligence, not job experience or formal education. By example, to perform effectively, a physician requires an IQ of 114 or higher, a high school teacher between 108-134, a fire fighter between 91-117, and a meat cutter between 86-112. On the average, people with IQ's less than 75 do not learn much in school, it takes an IQ of 85 or higher to be a professional baseball player, and the IQ of the average criminal is 92. Interestingly, the IQ of John Gotti, the Mafia leader recently sentenced to prison, was 110. Apparently, in whatever profession, the brighter students rise to the top.

Now realizing what constitutes intelligence, the question can be asked--what is a genius? If simply a matter of IQ and the general population, a score of 160 would be 1/10,000, 168 would be 1/100,000, and 180 1/1,000,000. No, genius is more than being smart, as measured by a high SAT score, an ability to quickly work a cross-word puzzle, or to speak 6 languages. Genius is the ability to not only ~~be~~ be able to solve existing problems but to identify new ones. Conventional genius may move the world along briskly and efficiently whereas the unconventional genius "whacks life about" in a manner in which insanity and inspiration often appear to be identical. Whether discussing a Pablo Picasso, a Sir Issac Newton, or a William Shakespeare, where do these people come from and how do they think the way they do? Perhaps the best explanation was given in describing a whiz-kid computer programmer, "Someone who thinks ideas that are so good you can't see where they came from". In addition, geniuses are people who are more willing to take greater intellectual risks, are able to connect the unconnected, and to question the obvious. And, although they may produce a few good works and many bad works, they produce. It is not a coincidence that genius and chance are often synonymous. A true genius is determined, not necessarily by his IQ score, but by what he does, by the expertness with which he does it, and by the esteem held by those who are capable of judging his actions. From this point of view, "... men of genius are those whom the whole intelligent part of a nation

mourn when they die, who deserve a public funeral, and whom future ages rank as historical characters".

Held to this high standard, it is unlikely that my son's friend is a genius. However, it is likely that, as measured on an IQ test, my son's friend could be in top 2% of the general population. Also, it is likely that she will be more productive than the general population, will earn a higher income, will have been genetically influenced by 60%, will be able to perform some intellectual tasks better than others, will be able to slightly improve her IQ if she stays in school, and should live a happy life if she works within a challenging and supportive environment. However, it is equally clear that the whole area of intelligence provides a clear example of natural laws (intelligence) being used or subverted for social purposes (equal education for all); they are mutually exclusive. Whether we like to recognize it, intellectual equality does not exist. It never has and it never will. In the years ahead, as science better understands the workings of the brain, societies will be forced to make many difficult decisions concerning the creation, enhancement, and channeling of intelligence within that society. Whether involving eugenics, educational funding, affirmative action, workforce efficiency, or the best use of a society's more intelligent individuals, each of these issues has the potential of leading to a Brave New World. Hopefully, an unconventional genius will step forward to solve these difficult issues. And if it turns out to be my son's friend, the genius, then so be it.