IMPACT OF IQ ON SOCIETY

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Abstract *– Today's culture values intelligence as an indicator of success; though there are many concerns and doubts about how to measure intelligence. The tests used to measure IQ can be biased or misleading, as they usually do not reflect the totality of a person's cognitive abilities in the context in which they find themselves. That's why we must question and adapt intelligence assessments according to skills and context, and why it is necessary to consider a broader set of criteria and not limit themselves to traditional mechanical faculties, for people to be better valued in the society we live in.*

Keywords*: intelligence, knowledge, IQ, knowledge tests.*

INTRODUCTION

Intelligence tests have been characterized by the significant impact they have had on society. Although it is considered by many to be a valuable tool for assessing people's learning potential, there is a need for a critical analysis of its usefulness in society; meanwhile we live in a world where there is a variety of knowledge and cognitive skills that are not valued by these tests. Intelligence quotient (IQ) tests have been around for a little over a century. The purpose at the beginning was not to improve education, but to filter it or classify people. In the 1900s, psychologists worked with academic people to seek to prioritize educational opportunities and classify the population. The intelligence test that boosted their development was carried out by Lewis Terman, who provided them with information to develop tools to strengthen this idea.

In 1916, a test was first published that ranked children according to their cognitive abilities in math, logic, reading, and reasoning. In the 21st century, it was verified that the cognitive skills most valued by this test have evolved. In addition to the traditional abilities considered for IQ tests, skills such as creativity, adaptability, and problem-solving are analyzed. Shower skills are considered essential in today's world.

1. METHODOLOGY

This work was supported with a qualitative approach, which is based on understanding the phenomena or situations that are studied within a context, according to the study .[1]. On the other hand [2], he affirms that this paradigm is characterized by being based on experience, intuition, evaluation of processes, writing of facts, in addition, to allowing the researcher to relate the researched, which allows good descriptions to be made from observations in a real context.

The research design used was cross-sectional or cross-sectional descriptive. According to [1], they affirm that the type of descriptive research is characterized by presenting the information without any modification, indicating the situation at the time of the investigation, to analyze it, interpret it and print what was achieved during the research process.

The instruments used to collect the information in this research are the following:

1. Research done on intelligence on IQ.
2. Questionnaire with open-ended and closed-ended questions about IQ.

3. Experiences of the academic community and educational institutions on the impact of tests that measure intelligence.
4. Reflections on the impact of intelligence tests on society.

2. Intelligence and intelligence quotient

The IQ, which is represented by the acronym IQ in English to refer to the Intelligence Quotient, while in Spanish it is abbreviated by IQ. Its definition is conceived by many people as an objective and rigorous measure of intellectual capacity; while others define it as an evaluative scale to classify or compare the ability of different people in areas of thinking such as basic mathematics, reasoning, or logic [3]. And IQ is the result of a standardized test that measures a person's cognitive abilities and intellectual ability relative to their age group [4][5].

But the following questions always arise: can IQ really be measured? And in which entities or organizations is it required as an indispensable requirement? These concerns and others are articulated in this work, which analyzes the origin of the IQ, what it really measures, its influence on society and the factors used to measure it. Although there are several online intelligence tests, there are many doubts about their use and measurement of people's reason or talent; Even so, there are some websites where you can practice or train each of the topics presented in these tests to get a good score [6].

According to historical records, Plato and Aristotle were the pioneers in psychological measurement, which had great importance in the nineteenth century, to identify and classify people by their mental capacity. In 1938, the Frenchman Esquirol published a work on mental retardation, its procedures for classifying it, and training techniques, which are considered one of the first steps or investigations to measure intelligence. According to Ingles Galton, who became interested in studying human heredity, he developed the first tests, which were used in the anthropometric laboratory in 1884. These tests were of a sensorimotor nature and were used to measure visual acuity, auditory, muscle energy, reaction time, etc. That's why he believed they could be used to measure intellectual capacity. Galton contributed several statistical methods to the analysis of data on individual differences and was one of the first to apply scales of estimation [7].

The expression "mental test" first appeared in a written article by the American psychologist Cattell in 1890, where he described the tests applied to university students to assess their intellectual level. These tests measure sensory abilities and other simple functions such as: speed of movement, sensitivity to pain, muscle energy, acuity of sight and hearing, weight, reaction time, memory, and other factors.

One of the significant advances for these intelligence tests came in 1904. When the English psychologist Charles Spider-Man was analyzing the results obtained by his students in various subjects, he wondered how the performance of one subject X would relate to his performance in another subject Y.

To solve this problem, the following solutions were contemplated: One option would be that the better student in Mathematics would do worse in English. Maybe because he spent more time with Math and therefore had less time to devote to English. So performance in different subjects would be negatively correlated. Another option is that performance in one subject has no relation to performance in the other subject; as different disciplines require different skills, so perhaps the results in both disciplines are not related. The third option is that, if the student does well in Math, he or she will do better in English. This would imply a positive correlation between the scores of both disciplines.

A correlation coefficient can vary in the range [-1, 1]. A correlation coefficient minus one (-1) indicates a perfect negative correlation, meaning that the increase in one variable corresponds to a precise and predictable decrease in the other variable. Similarly, a correlation, a positive one (1), indicates a perfect positive correlation; while a correlation of zero (0) indicates that there is no relationship between the two variables. Any value between zero and one indicates a positive correlation; but the data has some random spread. The square of the correlation coefficient indicates the amount of variation in one variable, which can be explained by the variation in the other variable.

For example, if the correlation coefficient is 0.5, then 25% of the variation in one variable can be explained by the other. When Spider-Man analyzed his data, he found a positive correlation, as those who did well in Math tended to do better in English, scoring a correlation coefficient of 0.64.
But Math and English were not the only subjects the students took, they also studied classical literature, French, obtaining the following results.

Courses or Subjects	Classical Literature	French	English	Mathematics
Classical Literature	0.87	0.83	0.78	0.70
French	0.83	0.84	0.67	0.67
English	0.78	0.67	0.89	0.64
Mathematics	0.70	0.67	0.64	0.88

When Spider-Man analyzed the correlations between all these subjects, he found the same pattern, where students who did well on the test in one subject tended to do well in all of them. How do you explain this situation? Well, Spider-Man proposed that every person possesses some level of general intelligence, what he called the G-factor. This concept was considered to observe how quickly students could learn new knowledge, recognize patterns, and help them think critically no matter what course they are watching. This explains why subject scores are correlated. Those with high G scores performed well in all subjects; and those with low G scores performed poorly. Spider-Man published his findings in an article titled "Objectively Determined and Measured General Intelligence."
But the correlations obtained were not perfect. So in addition to the G-factor, Spider-Man proposed subject-specific factors, or S-factors. A student's performance in Math, for example, would depend on his or her general intelligence and subject-specific factor for Math. Subject-specific factors could increase or decrease performance in that subject. Spider-Man believed that specific factors could be trained, but general intelligence was fixed, so he was looking for a way to reliably measure general intelligence.
During these times, psychologist Alfred Binet researched methods for assessing intellectual ability. But it was in 1905, when the French government, through the Secretary of Education, commissioned him to study children with mental retardation, where he built, together with the coworker Théodore Simon, one of the first classifications to measure intellectual capacity, the Binet-Simon scale.
The Binet-Simon test, composed of thirty (30) problems in increasing order of difficulty, mediates reasoning, judgment, and comprehension. In its content there were questions where students were asked to correctly define some abstract words or terms such as: charity, justice, and kindness. And for students or people to repeat sentences like, "My son, you must work very hard to live," "you must go to school every morning." In addition to using questions with a certain discrimination in which he said: "Of these two faces shown, which is the prettier?"
In the second scale presented in 1908, the number of tests was increased, although some of the first version considered unsatisfactory were eliminated. In addition, the tests were grouped into age levels, which allowed the score obtained by a child to be expressed as a mental age (age of normal children whose performance was equal). The third version was introduced in 1911, with some minor changes, as tests were added at various age levels and the scale was extended to the adult's level.
The Binet-Simon test was very successful at the time, so it was translated and adapted into several languages. The best-known version was made in the United States of America, by Terman at Stanford University and was called in 1996 as the Stanford-Binet test, in which the notion of intelligence quotient was used for the first time. From this was obtained a formula where mental age was divided by real age and multiplied by one hundred (100) to arrive at an intelligence quotient, thus giving birth to what we know today with IQ.

$$IQ = \frac{Edad\ mental}{Edad\ cronológica}\ 100$$

So the Binet-Simon test, considered to be the first test to measure IQ in the world, was translated by Henry Goddard into English and brought to the United States of America to Stanford University, where Lewis M Terman standardized it through large samples of American students. After making some modifications, they turned it into the Stanford-Binet test, which was applied in the United States of America (USA) for many decades. In 1912, Kuhlman extended it to an age scale of 3 months. With the development of intelligence tests, the first vocational guidance offices emerged such as Munich (1902), France (1906), USA (1908), Belgium (1914), Spain (1916), England (1920), etc.

Collective intelligence tests appeared in 1917, when the United States decided to participate in the First World War and needed to intellectually classify 1,500,000 recruits. The most used were Alpha and Beta, the first was intended for the general population and the second was used with illiterates and foreigners who were not fluent in English. The second revision of the Beta (Beta II-R) is currently in use. From the First World War onwards, psychological tests had a great advance. In addition to intelligence tests, which were mainly verbal, specific aptitude, performance and personality tests were developed.

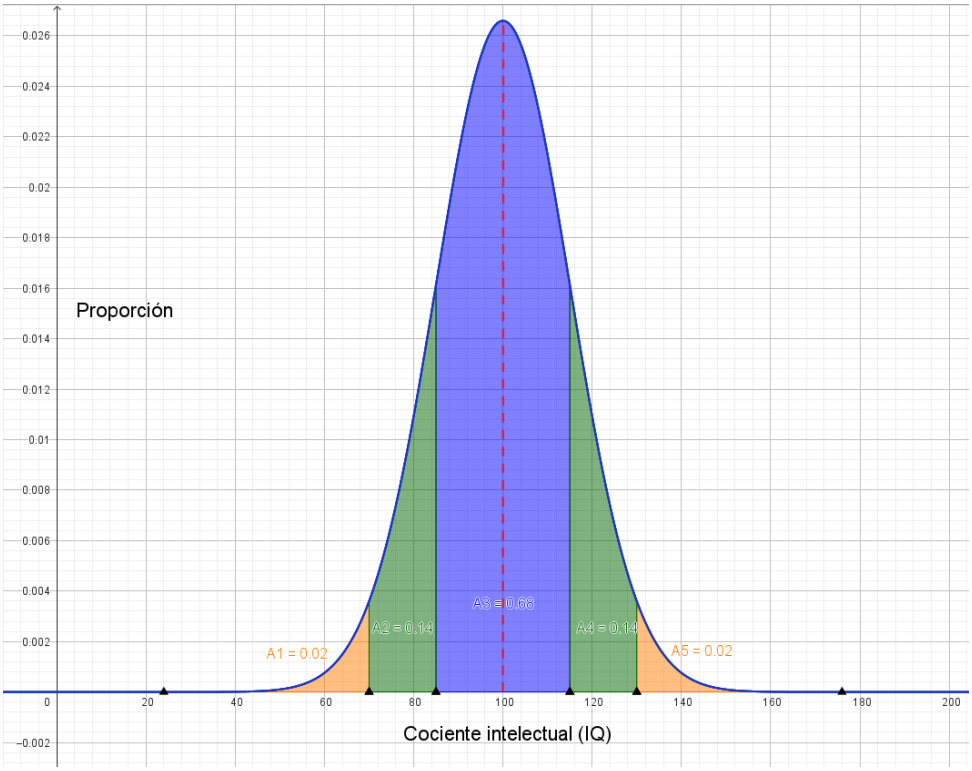
Specific aptitude tests were constructed primarily for career guidance and selection. The most used are mechanical, bureaucratic, musical and artistic skills. Methodological advances, mainly factor analysis, contributed a great deal to the development of tests and especially to the development of multiple aptitude batteries, which appeared in 1945.

The article entitled "Evolution of Concepts of Intelligence: Current Approaches to Emotional Intelligence for Educational Guidance" It describes the different conceptions of intelligence that have been held in the fields of psychology and education. In addition, the consideration of new concepts, such as multiple intelligences and emotional intelligence, which are fundamental in the optimal development of people throughout life, is addressed[8].

3. Analysis and discussion of results

The Binet-Simon and Stanford-Binet tests were the beginning of the development of IQ tests, and they all had the same goal, which was to measure the G factor. The way they did this was by assessing several different mental abilities including verbal memory, spatial memory and numerical skills. Each of these areas could have a subject-specific change, but by averaging them all together the idea was that the subject-specifically effects and would cancel out leaving a good approximation of G.

But there is always a margin of error, which is why psychologists designed IQ tests made up from 7 to 10 sections with different tasks, to try to minimize the subject's specific distortions. All the different IQ tests differed in the number of questions and their difficulty. So to standardize the scoring system each test took a large sample of the population; the scores were normalized so that the mean was 100 and the standard deviation was 15, in this way is how it continues to be done up until now and it is known as IQ, It is assumed to be a measure of an individual's G-factor compared to the rest of the population. The graph below shows how 68% of people have an IQ between 85 and 115, only about 2% score above 130 or below 70.



To measure IQ, the tests currently used scoring ranges that allow the IQ in a region to be classified under a normal distribution curve, that is:

Interval or Range	IQ Rating
130 - more	Vastly superior intelligence
120 - 129	Superior Intelligence
110 - 119	Brilliant Normal Intelligence
90 - 109	Average Normal Intelligence
80 - 89	Slow Normal Intelligence
70 - 79	Borderline Intelligence
Up to 69	Mental deficiency

It should be noted that there is an exclusive classification for mental deficiency (considered disability). However, some researchers also consider borderline intelligence as a possible disability.

Interval or Range	IQ Rating
55 - 69	Mild mental deficiency
40 - 54	Moderate mental deficiency
25 - 30	Severe mental deficiency
Up to 24	Profound mental deficiency

Borderline intellectual ability, also called borderline, refers to a complex clinical entity that has been investigated, made up of those people who technically do not have an intellectual disability, but who obtain low IQ scores. Which are at a threshold of approximately 71-84. These individuals face the ignorance and incomprehension of a society that does not recognize their limitations or treat them as equals, and that, in most cases, they finish compulsory schooling, which leads them to have difficulties in accessing the world of work. In addition, it is not actively participating in society [9]. IQ tests are characterized by having the following sections in their designs: vocabulary, numeric, and Raven's progressive matrices. The vocabulary section, designed to analyze the meaning of words, usually asks them to identify their synonym or antonym. While, in the numerical section, it is designed

to detect patterns with numbers, it is usually given by a series of numbers in order for the student or individual to find the number they ask for in the series or sequence. A good technique for finding these numbers is to find the difference between adjacent terms just to find the relationship the numbers and their sequence.

According to [10] the Raven Progressive Matrices (RPM) tests, they aim to measure general cognitive ability, or educational or creative ability (Raven, Raven, Raven, & Court, 1998a, 2000). These matrices usually consist of five sets of items shown in the shapes that are rotated or moved by a certain pattern. In each set, the elements become progressively more difficult. At the beginning of each series, the problems are easy, but they follow a different logic. The problems get progressively more difficult. These RPMs offer five opportunities to familiarize yourself with the method of thinking required to solve problems. In addition to the Standard series, there are Progressive Color Matrices (CPMs), which are designed to disseminate the scores of the least able children and adults, and the Advanced Progressive Matrices (APMs), developed to disseminate the scores the top 20% of the population.

In Raven's progressive matrices section, a grid of three rows by three columns is presented, with symbols in each of the cells; the goal is to find the symbol that a specific cell is asking for. The pattern in most of these puzzles obeys one of a few different logical rules, one is translational motion whereby symbols move from one cell to the next in a predictable way; while the second is the rotational movement of one or more objects rotating from a cell. To find out which symbols appear in the cell you are asked for, you just must detect the behavior of the shapes in each of the cells of the matrix and make you find which is the missing shape.

Most of these tests are done under pressure for the time given to take them, which implies that each of the questions has about 10 to 30 seconds to answer. What's remarkable about IQ tests is that in an hour or two of questions about vocabulary, numbers, and arbitrary shapes, they can predict a surprisingly large part of your life. For one, the higher your IQ, the bigger your brain is going to be. A large 2005 meta-analysis estimated a 0.33 correlation between IQ and brain size [11].

IQ and Brain Size

Meta-analytic results for brain volume and intelligence [11].

Distribution	Number of studies	Sample size	Observed Mean Correlation	Average correlation corrected for range constraint
All Correlations	37	1530	0.29	0.33
Analysis according to whether the degree of range restriction was interpolated				
Interpolation	21	963	0.29	0.32
Non-interpolation	16	567	0.30	0.34
Gender analysis				
Women	12	438	0.36	0.40
Men	17	651	0.30	0.34
Mixed Sex	8	441	0.21	0.25
Analysis by age				
Adults	24	1120	0.30	0.33
Children	13	410	0.28	0.33
Analysis by age and sex				
Adult women	8	327	0.38	0.41
Girls	4	111	0.30	0.37
Adult Men	11	420	0.34	0.38
Children	6	231	0.21	0.22

So a high IQ is literally a big brain. IQ also predicts school success. In 2007 Scottish psychiatrist Stuart J. Ritchie, measured the IQs of 13,000 11-year-olds and 5 years later when these students took the national school exams, he compared their test scores with their imposes, their performance on the IQ test 5 years later on their exams was around 0.8. That correlation is extremely high, meaning that about 2/3 of the variation in school test scores could be predicted with IQ tests taken 5 years earlier. The correlation coefficient of this study is at the high end of the 0.2 to 0.8 range found in similar studies, but the research supports the claim that IQ is a good predictor of school success, it also predicts the number of studies that a person will complete, perhaps this shouldn't be so surprising since some school tests are essentially intelligence tests. It has been argued that tests such as Scholastic Aptitude Test (The SAT), American College Testing (ACT) or Graduate Record Examinations (The GRE), are basically IQ tests, correlating with standard IQ tests at around 0.8. Now if on SAT I have a score of 1330 which corresponds to an IQ of 130, it would be interesting to see if official IQ matches that increase my score by familiarizing myself with IQ style questions.

IQ also has predictive power outside of school, one of the strongest findings being that IQ can predict job success. Especially in technical or highly complex jobs. But how do you measure career success with IQ? You ask the bosses of the workers to rate them with questions of how much people earn, productivity is measured in ways that economists use the output generated. Correlations typically range from 0.2 to 0.6, and the effect is most noticeable for more complex jobs, which makes sense. The highest effect is for military training, In fact, the U.S. military will not accept anyone with an IQ below 80; they also limit the number of recruits with IQs between 81 and 92 to 20%.

During the Vietnam War, to increase the number of applicants they relaxed this last requirement, but what they found was that those below the threshold were 1.5 to 3 times more likely to fail recruit training and needed 3 to 9 times more remedial training. Altogether, this added so much tension that the Army functioned more efficiently without the extra recruits. A total of 5478 people recruited under this initiative died, with a mortality rate three (3) times higher than that of ordinary recruits; so the military set its requirements and today anyone with an IQ below 80, that is, some 30,000,000 Americans would not be eligible to join the Army.

Even outside the Army, IQ seems to have a bearing on how long you live, in a Scottish study scientists looked at intelligence tests of children when they were 11 years old, now 65 years later they looked at who in the sample was still alive at age 76, and found that on average for every 15-point increase on the IQ test you would be 27% more likely to still be alive at 76.

A meta-analysis confirms that people with a higher IQ have a lower risk of dying during the period of time investigated in each study. The last important thing he said seems to predict is revenue. This study shows a clear trend of income increasing with IQ and found a correlation coefficient of 0.3 but the variance is huge; in fact, the top three (3) places in this study had an IQ below 100.

A meta-analysis of 31 studies found that the correlation between IQ and income was 0.21, this is significant but small, meaning that only 4.4% of the variation in income is explained by IQ; Maybe one of the reasons we see a high correlation with income is because economically intelligence isn't necessarily that highly rewarded, maybe there are jobs like just making a scheme to sell real estate, maybe that doesn't require having a lot of intelligence, at the same time you have very smart people who become college professors but don't necessarily earn well. Of course, a lot of people who have very high IQ scores don't have the same interest in accumulating money. The relationship with net worth is even weaker, it barely seems to correlate with IQ, even though people with a higher IQ are supposedly smarter and on average make more money each year, but this apparently doesn't translate into saving or accumulating more wealth overall.

But if IQ correlates with school performance, job performance, income, and longevity, why don't we hear more about it? it's because IQ has a dark history.

When Henry Goddard's proof came to America, its use and interpretation changed dramatically. In France, Binet believed that intelligence could be improved through education, he designed his exams so that struggling students could receive more help catching up; but in the United States the modified test was given to adults to classify them by intelligence. Researchers like Spider-Man believed that the G-factor was immutable, that the general intelligence you were born with would be the same for

the rest of your life. And many thought that the G factor was inherited, passed down from parents to children, these days we would say that it has a genetic basis. There's some evidence to support these claims, IQ seems very constant over a lifetime, so they were tested when people were 11 years old, they found all that evidence in a file and followed those people, and they did the same test when they were 90 years old. Their scores 80 years apart correlated between 0.5 and 0.6.

There's also evidence of a genetic basis for IQ, you find, for example, that if you get identical twins and you do an IQ test, you have a very strong correlation, almost like testing the same person a few weeks apart. Henry Goddard used claims that intelligence was inherited and immutable to put IQ at the center of the American eugenics' movement. Eugenicists wanted to prevent those with undesirable traits from having children. Many states passed laws to allow forced sterilization of people who did not meet a certain threshold on an IQ test. the constitutionality of those laws was upheld by the Supreme Court in 1927. Even words we used as insults like moron, idiot, imbecile were used as scientific terms. At his trial Justice Oliver Wendell Holmes wrote, "It is better for everybody if, instead of waiting to execute the degenerate offspring for crime or starving them for their imbecility, society can prevent those who are manifestly unfit from continuing their species, three generations of imbeciles being enough." In total, more than 60,000 people were forcibly sterilized because of these laws. In fact, they served as a model for Nazi Germany. Hitler himself claimed to be inspired by American eugenicists.

IQ in history has been used for horrible things in the past. At the Nuremberg trials after the war, some Nazis cited the U.S. Supreme Court's decision. Given this horrific history, it's understandable that many people completely ignore IQ today. In the science of intelligence there are several things in which the first researchers got it wrong, one is that IQ is not determined entirely by genetics, can the effects of genetics on the social environment be quantified? We have studies of twins, on average through their lives it's like 50 to 50, to heritability and social environment. It simply cannot, for ethical reasons, be estimated in humans, with a reasonable degree of certainty or accuracy. But according to reports or literature on this topic, there is equally wide range that is probably between 40% and 70%. And since education can improve IQ, it's not completely fixed for life. Besides, intelligence might not be a single concept as initially imagined.

These days, scientists recognize all forms of fluid and crystallized intelligence, fluid intelligence is their ability to learn, process information and solve new problems; while crystallized intelligence involves the knowledge you've accumulated throughout your life. Both types of intelligence increase throughout childhood, but fluid intelligence peaks in early adulthood and then declines; while crystallized intelligence remains more stable.

Raymond B. Cattell (1905-1998) was one of the most emblematic authors in the field of psychology and especially on individual differences, he developed a model of intelligence that differs from the unitary conception proposed by Spearman. Thus proposing the existence of two types of fluid intelligence (Gf) and another crystallized intelligence (Gc).

Fluid intelligence (Gf) refers to the Innate Ability to solve new problems and adapt to changing situations. It doesn't depend on prior learning; that is, it is not based on new knowledge acquired. It is shaped by primary skills, such as induction, deduction, relationships and classifications, breadth of working memory, and intellectual quickness. It reaches its maximum potential in adolescence and tends to decline with the aging process and deterioration of the nervous system. It is evaluated by tests that measure the biological potentiality to learn or acquire knowledge [12].

Crystallized intelligence (Gc), while refers to the Set of skills, strategies and knowledge which represent the level of cognitive development achieved throughout the individual's learning history. It is related to the application of acquired knowledge in specific situations. It depends on the experience and education of the subject. Examples of crystallized intelligence include vocabulary, general culture, and specific skills acquired over time [13].

The main theory of the article entitled "Do the Intelligent Become Smarter?" is the development of fluid and crystallized intelligence, a work carried out by [14], in which the development of cognitive skills in third-grade students is explored. The main conclusions of this study corroborate that the fulfillment of the following factors: participation of 1,102 primary school students in 3rd grade.

Measurement of intelligence in two versions of the Berlin Test of Fluid and Crystallized Intelligence at two time points, with an interval of five months. Compensatory effect of fluid intelligence (gf) and crystallized intelligence (gc) showed a strong compensatory effect. This means that students who started with lower skills demonstrated greater improvement over time. Differential change in fluid intelligence (gf) compared to crystallized intelligence (gc). Predictors included student characteristics (interest and self-concept), family history (socioeconomic status, parental education), and classroom characteristics (teaching styles); However, only a few predictors had a significant contribution to the observed changes in (gf) and (gc). Regarding the overall independence in the results, they suggest that the development of cognitive abilities is generally independent of the initial state, despite the opposite effects of the Matthew effect and the compensation effect. This research sheds light on the complex interplay between initial skills, growth, and various contextual factors in shaping cognitive development during 3rd grade.

But IQ has also been misused to promote the idea of racial differences in intelligence, there is for example an observed gap between the average IQ of black and white Americans. Articles have also been published about the children of different nations of the world. Many of these nations are said to have an average IQ below 70. That's the limit for intellectual disability, how could this be? The conclusion that some draw is that there are genetic differences between races or nations in intelligence, but this is a gross misrepresentation of the data. The problem is that IQ tests don't necessarily measure what you think they're measuring. And the proof is that there is a representative sample of white Americans with an average IQ of 70, who are these people? just ordinary Americans who lived about 100 years ago.

Researcher James Flinn studied the average IQ test scores over the past cycle, and from time to time the tests are updated and normalized to keep their average at 100. What Flinn noticed that every time the scores were renormalized, they had to go down a little more, by about two or three points per decade; and if they didn't what we would see, is that the average IQ of the entire population was increasing at a steady rate for the last 100 years, resulting in an increase of around 30 points, this is known as the Flinn effect. Were our immediate ancestors on the verge of mental retardation? Because a score of 70 is normally the score for mental retardation, or are we about to be gifted? Because 130 is the cut-offline for the gifted.

The genetics of the population haven't really changed in 100 years, so what caused the increase? Well, there is some debate about the real causes, but one of them is probably improving child nutrition and health. Height also increased during that period; people became healthy. Another cause is better education, there's a lot of evidence that school makes you smarter, you become better at problem solving if you have more knowledge, because it's easier to make associations if you have more knowledge with which to make associations. A third proposed cause is a shift in the types of work most people do, from mostly manual labor 100 years ago to much more abstract thinking these days. And that change could have made us better, answering the kind of questions that are asked on IQ tests. The point is that IQ tests appear to objectively measure intelligence, but they don't, even in the same country, separated only by time, cultural changes can affect average IQ test scores. So why not expect cultural differences between groups at the same time to have the same effect? Some tests label themselves as culturally fair, which means that the questions are equally valid for all cultures, but the truth is that it is impossible to build such a test, but does this work? No, that's just a title, it's just a marketing term, because there is no such thing as a completely culture-free or culturally fair test.

Culturally fair tests evaluate visual relationships, geometric shapes, and patterns. Ignoring the fact that cultures differ, for example, whether they have words for shapes, or spatial relationships. These differences influence how people think about and use categories. It's also questionable whether cultures and without printed materials perceive them the same way we do, because culturally just tests don't assess ethnobotanical knowledge, or training dogs to hunt, or surviving alone in the jungle. Arguably, these forms of intelligence are more important for survival than knowing any point on the IQ test, but since they are less common in our culture, and we don't have good ways to measure them we look at IQ questions with the ultimate way to quantify intelligence. And the people who do these

tests agree, there are strict requirements before a validated test for one population can be used as a very different population, even in the limited forms of intelligence that IQ attempts to assess.

There are other factors besides G that affect final IQ, such as motivation, how much is someone incentivized to complete the test? It can have a marked impact on your score. Many studies have attempted to pay subjects to complete an IQ test, in some studies they were offered a dollar, other studies offer between a dollar and $10, and others offer more than $10. A large meta-analysis showed that motivating people in this way increased IQ, and the higher the dollar amount, the greater the average increase. At the high end, IQ increased to 20 points. In effect, it is higher for those with below-average IQs; so in addition to G, IQ tests also measure motivation.

In addition, to obtain a good IQ score it is necessary to train and get advice, these allow you to raise the scores up to 8 points or more. Exam strategy is also important; some people are better at doing exams under time pressure than others. You also need to know when to skip questions or how to eliminate wrong answers, plus anxiety also plays a role, as a small amount of anxiety is good, but beyond a certain point it negatively affects performance.

And what is IQ good for? For evaluations on forensic neuroscience, where and about 90% of the cases are the death penalty, which is one of the most common topics and that is related to Atkins' defense, which takes its name from the U.S. Supreme Court case, which eliminated the death penalty for people with intellectual disabilities. Can't a criminal fail the IQ test? No, or can't they intentionally mis answer every question? No, you would know, because they are included as in the test as any test, since there are built-in disability measures, which are detected using several mathematical algorithms that allow detecting with a high percentage of people who try to fake a poor performance in their IQ.

Something that we might be interested in is to increase people's cognitive ability at an early age, even if they go into cognitive decline, or if it takes them time to get to that point, where they're going to have real everyday functional problems, where they lose independence if it's about the idea of your money. Or it's about dealing with reading labels or whatever situation people suffer from when they go into later stages of cognitive decline. If we could figure out a way to increase people's intelligence in a lasting way that would be a great help, perhaps its best use is in identifying people with strong intellectual abilities who otherwise have not been able to demonstrate them.

Teachers recommend that a child go to the gifted program because they are usually seen working well in the classroom, but if you replace that with a standardized IQ test, you find a higher proportion of poor children and ethnic minority children in the gifted program, when you use an IQ test, and the reason is that you're using an objective measure. You don't just rely on the opinion of some professor [15]. Getting into a good school depended on who you knew or who your parents knew, or how much money you had, not your performance; The idea that you could try to develop an objective measure that would try to eliminate all those social biases was a well-intentioned idea.

Intelligence, from the perspective of psychology, has a double meaning that must be clearly distinguished. On the one hand, there is the popular concept of intelligence, which is interpreted as skills, talents, cultural baggage, and memory. On the other hand, there is the formal or scientific concept, which considers intelligence as an underlying capacity that allows for "superior" behavior compared to more "primitive" or inferior ones, such as instincts and habits [16]. When analyzing the above concepts, it is important to highlight that intelligence is a form of human behavior, based on complex functions such as imagination, judgment, abstraction, and memory.

On the other hand, intelligent behavior is adaptive, which is evidenced when an individual faces a problem in his or her relationship with the environment. In addition, it is considered that a good way to "measure" intelligence is to confront the subject with one or more problems to observe how they solve them. This reasoning guided Alfred Binet when he created the first intelligence test, known as the "Binet-Simon Intelligence Scale."

According to [17], cognitive psychology analyzes a person's ability or intelligence as a reflection of the knowledge of reality that he or she possesses, which is related as a series of abilities to process information that have not yet been processed in the individual's mind. A question that cognitive psychologists have been asking for a long time is: what does it mean to have a high verbal ability? or

what can be the nature of those basic information processing skills that distinguish low results from the results obtained in tests of verbal intelligence? doubts that researchers are currently trying to explain. And to do this, they make use of new instruments to measure intelligence.

CONCLUSION

After the above analysis, it can be inferred that the tests used to measure IQ is a subject that many psychologists, professionals, or the general public consider as a useful instrument for society, while others appreciate it as a discriminating instrument that does not really measure knowledge. A number of psychologists hate talking about intelligence and intelligence test scores or any kind of thing related to this topic. When institutions tell parents to apply a test to measure intelligence as part of the training process, most of them are a little reluctant, however, many say: "well I would like to know your IQ, but I don't really care about that, but in the end, they end up asking, What will be my child's IQ?"

On the other hand, there is also a heated debate about IQ, since there are radical extremist positions in two social groups, which are considered as positions that do not contribute to the processes of improving the processes of learning or intelligence of people. There is an extreme in society where people claim that "IQ in people is an important factor, and that it must be applied in order to classify individuals in a society in schools or particular forms of education", this is an extreme considered totally discriminatory and unproductive. But the other radical extreme that says that "these tests are totally useless, that they don't measure or say anything, that they are just a tool of racism and prejudice", this position also contributes nothing. It is evident that there is a conflict in both social groups, and people who are not in these extremes, or those in between, are ignored by people who have more moderate opinions or approach on these types of issues, so it is recommended to listen to these people, who share valuable and reasonable opinions on how to measure intelligence. Also, the biggest mistake is to consider that IQ determines someone's worth. What's more important is how to help the people around you achieve their goals and apply their valuable talents and skills in life, and remember what Stephen Hawking said: "that people who flaunt their IQ are losers."

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