

INTELLIGENCE

* GENERAL MEANING

Intelligence is a general capacity or ability that allows an individual to engage in constructive thinking. It is the ability to relate different things to one another.

- Goal-oriented action - This cognitive ability is directed towards reaching a specific goal, solving a problem, or achieving an "end" or objective.

- Thought construction - It involves the mental power to build or form one's own thinking processes effectively to navigate tasks & challenges.

VERNON'S THREE INTERPRETATIONS

- Biological meaning - This perspective focuses on an individual's innate capacity to adapt & adjust to environmental conditions & situations.

- Psychological meaning - This view relates intelligence to cognition, specifically innate mental efficiency & the general cognitive ability to perform abstract thinking & reasoning.

- Operational meaning - Intelligence is viewed as something which can be measured through standardized intelligence tests.

DEFINITIONS

- Ability to adjust - Various psychologists, including Ross, Burt, Stern, Woodworth, Piaget & William James define intelligence as the ability to successfully handle or adjust to novel circumstances. This group of psychologists argues that if an individual has the potential or capacity to consciously adapt & function in a new environment, they are considered intelligent.

Notable definitions

- Ross - Conscious adaptation to new situations
- Burt - Capacity for flexible adjustment.
- Piaget - Ability for adaptation to both the physical & social environment.

- Ability to learn - This perspective suggests that an individual's capacity to acquire new knowledge & profit from past experiences is a key indicator of their intelligence. Psychologists such as Buckingham, Thorndike, Colvin & Woodworth argue that intelligence is synonymous with the capacity to learn.

Key definitions

- Buckingham - Capacity to learn & benefit from experience.
- Thorndike - Views intelligence as the ability to make profitable use of past experience. Ex:- A child missing his school bus for the first time. It will be a learning

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 experience for him to avoid repeating the same mistake & adjust his future behaviour accordingly.

- Woodworth - Intelligence is the underlying ability required to successfully acquire knowledge, reinforcing that learning & intelligence are deeply linked.

- Ability to carry on abstract thinking - This view argues that an individual's intelligence is directly proportional to their capacity to engage in higher level cognitive processes rather than concrete or physical tasks. The cognitive power of the mind manipulates abstract concepts & reason effectively.

• Notable definitions

- Terman - An individual's level of intelligence is measured by the degree to which they can engage in abstract thinking.
- Binet - Capacity to think well, judge well & remain self-critical. This involves the ability to evaluate one's own thought processes.

TYPES OF INTELLIGENCE

Proposed by psychologist Hebb

- Intelligence A or Cerebral intelligence - This is considered the innate or biological capacity of an individual. It is entirely dependent on one's neurological & biological systems & is inherited.

- Intelligence B or phenotype intelligence - This represents the intelligence that an individual actually demonstrates or develops through interactions with their environment. It is the result of Intelligence A being influenced by life experiences & external factors.

CHARACTERISTICS OF INTELLIGENCE

- Intelligence is an endowment - a gift - that aids a child in their learning process & goal achievement.
- Facilitating learning - Intelligence makes the learning process more efficient, helping individuals achieve their goals in less time.
- Abstract thinking - It enables the progression from simple, concrete ideas, to more complex abstract concepts & ideas that remain within our mental framework.
- Gaining from experience - Intelligence helps children learn from their previous experiences & those of others, fostering positive life changes.
- Evaluation & decision making - It provides the insight needed to evaluate the future, act according to situational requirements & distinguish between right/wrong or social/antisocial activities.
- Genetic & environmental - It is not solely determined by genetics, environment is a primary factor.
- Adaptive nature - Intelligence includes the ability

to learn & adapt to various situations & symbols.

- ♥ Mental capacity - It creates intellectual ability & mental power, with no cultural group being inherently superior due to these factors alone.

RELATIONSHIP BETWEEN INTELLIGENCE AND KNOWLEDGE

- ♥ Intelligence vs. knowledge - Knowledge is information we acquire, while intelligence is the ability to put that knowledge to practical use in life.
- ♥ The directionality of the relationship - While having higher intelligence helps a person acquire knowledge more effectively, the reverse is not necessarily true. Simply accumulating more knowledge does not automatically result in greater intelligence.
- ♥ Wisdom as a goal - According to psychologist Rose, wisdom is the ultimate goal. In this hierarchy, knowledge acts as a means or a path to reach that goal of wisdom.

INTELLIGENCE DEVELOPMENT CURVE

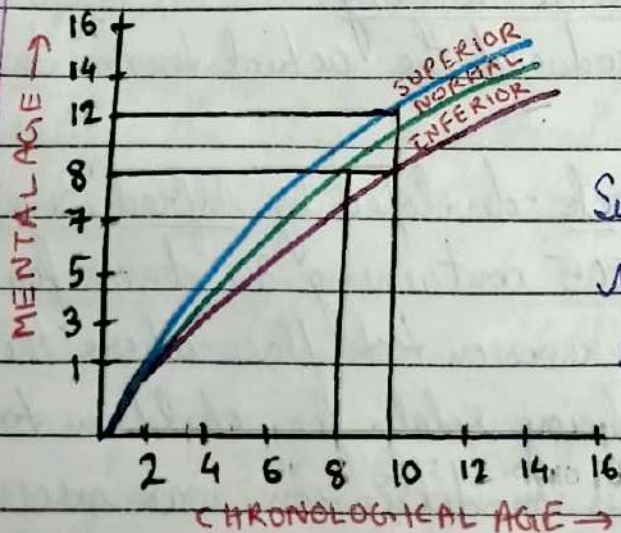
- ♥ Rapid early development - Intelligence development is extremely fast during the first six years of life. When plotted in a graph, there will be a sharp upward increase in intellectual growth during these years.
- ♥ Reduced growth rate - After the rapid development

observed in the first six years, the rate begins to slow down over the next 2 years. By the time a child reaches 10 yrs of age, approximately 90% of their intelligence development has already occurred.

- Maximum intellectual maturity - Intelligence reaches its maximum point of development at around 16 yrs of age. Some psychologists argue that intelligence continues to grow in a person's early 20s. This view arises from confusing raw intelligence with knowledge acquisition or life achievements.

- Binet & Terman perspective on development range
Binet suggested that the age at which an individual reaches their full mental maturity varies significantly proposing a range between 14 & 22 yrs old. As a result of Terman's extensive work alongside Binet, he established 16 yrs as the standard limit for mental growth.

- Understanding IQ & growth curves



$$IQ = \frac{\text{Mental age}}{\text{Chronological age}} \times 100$$

$$\text{Superior} = \frac{12}{10} \times 100 = 120$$

$$\text{Normal} = \frac{8}{8} \times 100 = 100$$

$$\text{Inferior} = \frac{8}{10} \times 100 = 80$$

The rate of intelligence growth is not uniform across all individuals. Instead, development follows distinct trajectories depending on a person's cognitive classification.

- **Superior** - These individuals demonstrate a higher rate of growth starting from early childhood & maintain this elevated level throughout their developmental years.
- **Normal / Average** - This represents the typical development path with intelligence scores between 90 & 109.
- **Inferior** - Individuals on this path show a slower, consistently lower rate of intellectual growth throughout the entire period of maturation compared to other groups.

CONCEPT OF IQ

• Historical development of intelligence testing

Alfred Binet is identified as the pioneer in formalizing the concept of mental age & is often referred to as the "father of mental testing".

William Stern introduced the actual term "Intelligence quotient" in 1912.

The Binet-Simon scale - developed by Alfred Binet & Theodore Simon in 1905 containing 30 items for assessment. In 1911 a significant revision took place where the scale was extended from being solely for children to include adults as well. This modification was necessary for diagnosing mental capabilities across a wider

age range. To accommodate this change, 5 items were included for every age level to ensure accurate evaluation. By the 1911 edition, the tests were designed to measure specific cognitive functions, including language processing, auditory processing, learning capabilities, memory & problem solving skills.

- Stanford-Binet scale modifications - After the 1911 revision of the Binet scale, which extended the test to include adults, Lewis Terman began working at Stanford University to further refine & adapt the scale. He initiated this revision around 1912, aiming to improve the existing framework. Terman's revised work was officially published in 1916. Because he was conducting his research at Stanford University & modifying Binet's original scale, the new test was famously named the Stanford-Binet Intelligence scale.

- The measurement concept - This period also highlights the contributions of Stern, who proposed the core concept of measuring intelligence quantitatively, setting the stage for standardized testing.

- Army alpha & Beta tests - During World War I, the American Psychological Association, led by Robert M. Yerkes, implemented intelligence testing for the rapid classification of military personnel. This allowed the army to assess & organize soldiers efficiently based on their cognitive abilities. To accommodate different literacy

levels among recruits, the army developed two specific types of tests: - **Army alpha test** - A language based test designed for literate personnel who could read & write. **Army Beta test** - A non-language performance based test for those who were illiterate.

- The formula for calculating IQ - This formula measures a person's intellectual development relative to their actual age, multiplied by 100 to provide a clear, whole number score.

$$IQ = \frac{\text{Mental age}}{\text{Chronological age}} \times 100$$

- Mental age - Refers to the cognitive level at which an individual is functioning or the difficulty level of tasks they can successfully complete.
- Chronological age - Refers to an individual's actual biological age.

It was introduced by Lewis Terman

• Terman's IQ classification table

- 140 and above: Genius
- 130-139: Very superior
- 120-129: Superior
- 110-119: Above average
- 90-109: Normal or average (majority of the population)
- 80-89: Below average

- 70-79 : Borderline / Dull
- Below 70 : Includes categories such as Moron, Imbecile & idiot, where the level of cognitive impairment increases as the IQ score decreases.

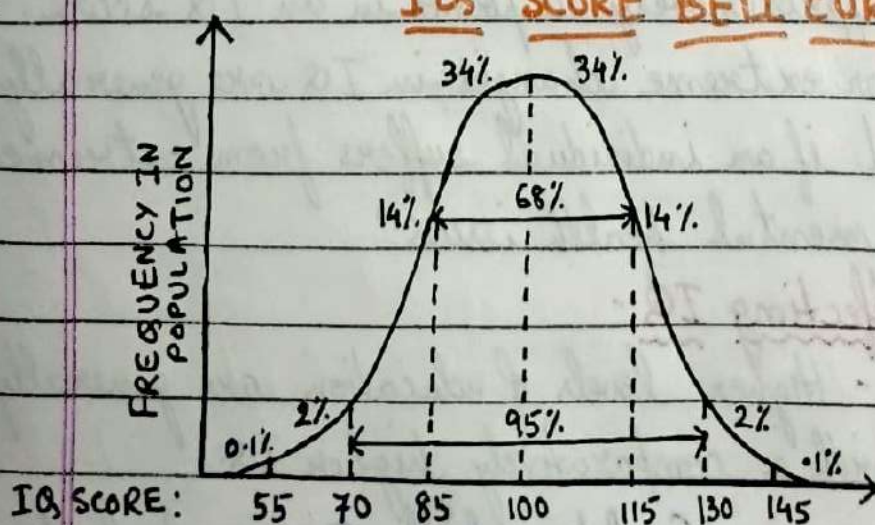
This classification system allows researchers & educators to group individuals into specific intellectual categories based on their performance on intelligent tests.

Garrett's IQ classification & distribution

- 140 & above :- Very superior (1.5% of the population)
- 120-139 :- Superior
- 110-119 :- Bright (distinct category above average)
- 90-109 :- Average (50% of total population)
- 80-89 :- Dull & backward (slightly below average)
- 70-79 :- Very dull (consistently low scores)
- 0-69 :- Feeble minded

IQ distribution in population

IQ SCORE BELL CURVE



IQ scores typically follow a bell-shaped curve also known as normal distribution curve. The peak of this curve represents an IQ score of 100, which is considered the average. The majority of the population clusters around this central point.

Individuals with exceptionally high IQs/geniuses or exceptionally low IQs (those requiring significant support) are found at the far ends of the curve. These cases are statistically less common compared to the large central group.

♥ Constancy of IQ - IQ is considered fairly constant. An individual's relative standing in terms of intelligence is unlikely to change drastically. Ex:- A child identified as "dull" or "bright" is expected to remain consistent in those general intellectual trends as they grow into an adult. But recent research suggests that factors such as environment, personal circumstances & individual effort can lead to shifts of approximately 10 points in an IQ score. Significant or extreme changes in IQ are generally only observed if an individual suffers from extreme physical or mental health issues.

♥ Factors affecting IQ -

- Education - Higher levels of education are generally associated with a comparatively higher IQ.
- Socio-Economic & Cultural factors - A lack of

social interaction or living in isolation can negatively impact IQ development.

- Home environment - A superior home environment, one that is stimulating & supportive, can help increase IQ, whereas an inferior chaotic environment may lead to lower IQ scores.
- Urban vs Rural environment - Individuals in urban settings often exhibit a higher IQ compared to those in rural environments.
- Occupation - Professional roles can correlate with different IQ levels. Data from the Army alpha test indicated that engineers, doctors, lawyers & teachers often scored in the highest categories, while roles like labourers or firemen were categorized in the lower scoring groups.

LIMITATIONS OF IQ

- Lack of reliability - IQ tests are not perfectly reliable. An individual may receive different scores if tested multiple times using the same test, suggesting that results can fluctuate.
- Not a true quantifier - Intelligence is complex & assigning a single numerical value does not capture the entirety of a person's cognitive ability.
- Environmental impact - Changes in an individual's environment can directly impact & alter their IQ score.