The human intelligence

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ABSTRACT

A crucial element of humans' unique abilities includes intelligence, which is a general mental ability for reasoning, problem-solving, and learning. Intelligence has been stereotyped as an amount of cognitive capacity that people are born with, which cannot be changed. However, Gardner's Multiple Intelligence Theory posits that individuals have different amounts, abilities, and unique combinations of bits of intelligence that are mutable and may be improved upon throughout their lifetime. In this paper, the meaning of human intelligence, its development, how it's tested, and the roles it plays in humans are discussed.

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INTRODUCTION

Intelligence has historically been conceptualized as a more or less fixed trait. Some believe that you do not have much control over your intelligence. It was genetically determined at birth. Efforts to raise the intelligence of children are always abortive [1]. Intelligence is highly correlated with successful training and performance outcomes. Individuals with relatively less intelligence often work harder in order to achieve goals and compensate for their lack of intelligence. Such individuals will avoid challenges. They are more likely to divorce, have a child out of marriage, be incarcerated, and need long-term welfare support. On the other hand, persons with high intelligence are associated with more years of education, higher status jobs, and higher-income [2].

The mental capacities to learn, understand, and reason, including the capacities to comprehend ideas, plan, solve problems, and use language to communicate are summed up in "human intelligence". It is the mental quality that consists of the abilities to learn from experience, adapt to new situations, understand abstract concepts, and use knowledge to adapt to the environment. It integrates cognitive functions such as perception, attention, memory, language, and planning [3]. Recent research efforts combining psychology, biology, neuroscience, anthropology, archaeology, and cognitive science are leading to an increasingly sophisticated understanding of how human intelligence evolved [4]. Since intelligence appears to depend on functions supported by different brain areas, it has been suggested that genetic engineering could be used to enhance intelligence. The mind may be regarded as a set of information-processing procedures (cognitive programs) that are embodied in the neural circuitry of the brain. Sex, age, and culture play a role in shaping intelligence.

ASSESSMENT OF HUMAN INTELLIGENCE

Human intelligence is commonly assessed by intelligence quotient (IQ) scores that are determined by IQ tests. An IQ is a total score derived from a set of standardized tests to assess human intelligence. In the United States, IQ scores are important for school, employment, job performance, and military service as an individual's IQ is incorporated into decision making. There are organizations that limit their membership to people who have high IQ scores. The mental tests are based on a model that portrays intelligence as a composite of abilities and can be quantified. IQ was originally computed as the ratio of mental age to chronological age, multiplied by 100. People differ along mental continua. Such individual differences in intelligence are usually measured using psychometric tests. Intelligence test scores and intelligence differences in the population both roughly follow a normal distribution. IQ tests are regarded as highly reliable, meaning that they produce similar scores upon repetition [5]. Intelligence tests are often used in educational, business, and military settings because of their efficacy in predicting behavior. There are also psychometric standardized tests that are not intended to measure intelligence itself but scholastic aptitude, including SSAT, SAT, ACT, GRE, MCAT, LSAT, and GMAT [2].

INCREASING YOUR INTELLIGENCE

The following points were recommended for intelligence improvement [6]:

    (1) ***Seek Novelty***: Geniuses like Einstein are constantly seeking out novel activities, learning a new domain. People who seek novelty and rate high on openness are constantly seeking new information, new things to learn, new experiences, and new activities to engage and expand cognitive horizons.

    (2) ***Challenge Yourself:*** Individual brain training games don't make you smarter. Once you master one of those cognitive activities in the brain-training game, you need to move on to the next challenging activity. The brain uses more energy during training times. To keep your brain making new connections and keeping them active, you need to keep moving on to another challenging activity as soon as you reach the point of mastery of the present activity.

    (3) ***Think Creatively:*** Creative thinking involves recruitment from both halves of your brain, not just the right. It may involve making remote associations between ideas and generating original, novel ideas that are also appropriate to the activity you are doing.

    (4) ***Do Things the Hard Way:*** Doing things efficiently is not doing your brain any favors. Technology does a lot to make things in life easier, faster, more efficient, but sometimes our cognitive skills can suffer as a result of these shortcuts. Your brain needs exercise. If you stop using your problem-solving skills, your spatial skills, your logical skills, your cognitive skills, your brain never improves.

    (5) ***Networking:*** By exposing yourself to new people, ideas, and environments, you are opening yourself up to new opportunities for cognitive growth. You can do this through social media such as Facebook or Twitter, or in face-to-face interactions. Learning is all about exposing yourself to new things and seeing things from a new perspective. The greatest thing about networking is that everyone benefits.

HUMAN INTELLIGENCE COMPARED TO ARTIFICIAL INTELLIGENCE

Artificial intelligence (AI) describes intelligence demonstrated by machines as opposed to the intelligence possessed by humans. It has the ability to mimic human behavior. It is the science of making smarter and intelligent machines that can think and act like humans. Such intelligent machines can learn about the world that surrounds them and take action. Human intelligence shapes the emergence and adoption of artificial intelligence. The one area where the power of human intelligence really shines is innovation. The rise of AI is raising the question of tasks that only humans can do. It prompted much concern about the fate of human jobs in the wake of AI. This has sparked an inevitable debate between AI and human intelligence. Artificial intelligence and human intelligence can be compared based on the following points [7-9]:

    (1) ***Field:*** AI belongs to computer science, while human intelligence is in psychology.
    (2) ***Speed of Execution:*** If one doctor can make a diagnosis in 10 minutes, AI system can make a million diagnoses at the same time.
    (3) ***Less Biased:*** Humans can be biased but the AI system is not biased in decision-making process.
    (4) ***Operational Ability:*** Humans need a break; the AI system works tirelessly.
    (5) ***Accuracy:*** An AI system is more accurate and precise than humans.
    (6) ***Memory Usage:*** Humans use content memory and thinking, while robots are use built-in instructions.
    (7) ***Learning Process:*** Human intelligence responds to millions of functions overall in their lives, whereas AI is developed for specific tasks only.
    (8) ***Decision Making:*** AI systems are clueless in the understanding of "cause" and "effect". They cannot make decisions like humans since they lack "common sense."

Some experts have predicted that with time, AI will exceed human intelligence. Machines are still away from what human brains are capable of doing. They will augment human tasks, but not replace them. It will not be possible for such machines to completely replace humans. The system that integrates both humans and machines is variably known as hybrid intelligence, extended intelligence, or ambient intelligence [10, 11]. The need for such systems is already acknowledged in critical domains such as medicine and driving.

HUMAN INTELLIGENCE APPLICATIONS AND CHALLENGES

(1) *Education*

Education practitioners and school administrators can benefit from learning more about human intelligence. Educators need that which enables competent action. It is their desire to equip students with what they will need to navigate successfully the world. They consider intelligence as the ability to reason and adapt. Any excellence in academic performance will be related to intelligence in some way. Standardized tests in one form or another have been used to measure intelligence. Intelligence tests are used predominantly for children who are considered intelligent. Children are full-time scientists, researching the world as they play [12].

(2) *Military Intelligence*

Human intelligence is part of military intelligence, which applies to the full range of military operations. The discipline elicits intelligence through interactions with human sources. Human intelligence plays a crucial role in world powers' national and foreign security policies.

(3) *Human Genetics*

Humans have brains with significantly increased size and complexity compared to their ape counterparts. Various approaches in molecular biology have been used to search for the human-specific genes and mutations therein that were related to human intelligence. Understanding the evolution of human intelligence is an important undertaking in the science of human genetics. Genetic changes affecting intelligence in hominid evolution have remained elusive [13].

(4) *Intelligent Buildings*

Human intelligence is gaining popularity within the "green building" and "intelligent building" discussion. Advocates of intelligent buildings consider greater automation as being necessary to provide high environmental performance. Intelligence comes in the operational efficiency of buildings and their effectiveness to provide functionality and occupant comfort. The type and extent of "automated" and "human" intelligence in buildings can affect issues ranging from energy and operational efficiency to inhabitant satisfaction, productivity, security, and privacy.

Conscious efforts to influence intelligence also raise ethical issues. Computer modeling is yet to resolve some major problems in understanding the nature of intelligence Standardized intelligence tests have incurred some criticism. There are critics who argue that to base intelligence on IQ test scores alone is to ignore many important aspects of mental ability. Some argue that intelligence tests should not be used in identifying giftedness. Many programs and important college decisions are based on the result of a single-shot standardized test. Conventional tests cannot reliably predict the way in which intelligence will be applied. Both traditional and modern psychometric theories face certain problems. First, it has not been proved that a truly general ability encompassing all mental abilities actually exists. Second, psychometric theories cannot precisely characterize all that goes on in the mind. Third, it is not clear whether the tests on which psychometric theories are based are equally appropriate in all cultures [14].

CONCLUSION

Intelligence has been a controversial subject throughout psychology's history. Intelligence is a quality that is unique to humans. Human intelligence is regarded as any information that can be gathered from human sources. It involves learning from previous experiences. This could be from education, work experiences, or a situation one goes through. Human intelligence increases by about three IQ points each decade due to improved health, education, and nutrition. Although intelligence testing has emerged as a widely used tool, the debate continues today about whether accurate measurements of intelligence are even possible.

REFERENCES

[1]   K. Cherry, "Theories of intelligence in psychology," October 2019, https://www.verywellmind.com/theories-ofintelligence-2795035

[2]   "Human intelligence," Wikipedia, the free encyclopedia, https://en.wikipedia.org/wiki/Human_intelligence

[3]   https://www.researchgate.net/figure/Threelevels-of-Human-IntelligenceSystem_fig1_305265106

[4]   L. Gabora and A. Russon, (2011). "The evolution of human intelligence," In R. Sternberg and S. Kaufman (eds.), The Cambridge handbook of intelligence. Cambridge, UK: Cambridge University Press, chapter 17, 2011, pp. 328-350.

[5]   "Intelligence quotient," Wikipedia, the free encyclopedia, https://en.wikipedia.org/wiki/Intellige nce_quotient

[6]   A. Kuszewski, "You can increase your intelligence: 5 ways to maximize your cognitive potential," March 2011, https://blogs.scientificamerican.com/guest-blog/youcan-increase-your-intelligence-5-ways-to-maximizeyour-cognitive-potential/

[7]   "Artificial intelligence vs human intelligence," https://www.educba.com/artificial-intelligencevs-human-intelligence/

[8]   M. A. Ali, "The human intelligence vs. artificial intelligence: Issues and challenges in computer assisted language learning," International Journal of English Linguistics; vol. 8, no. 5; 2018, pp. 259-271. [9] K. S. Yeon, "Artificial intelligence vs Human," April 2017, http://eng.dt.co.kr/contents.html?article_no=20170

[9]   K. Karachalios and J. Ito, "Human intelligence and autonomy in the era of 'extended intelligence,'" https://globalcxi.org/wpcontent/uploads/CXI_Essay.pdf

[10] E. Kamar, "Directions in hybrid intelligence: Complementing AI systems with human intelligence," Proceedings of the Twenty-Fifth International Joint Conference on Artificial Intelligence, 2016, pp. 4070- 4073.

[11] J. St.Julien, "Changing conceptions of human intelligence and reasoning: Implications for the classroom," Australian Journal of Education, vol. 44, no.3, 2000, pp. 254- 271.

[12] M. Li, W. Zhang, and X. Zhou, "Identification of genes involved in the evolution of human intelligence through combination of inter-species and interspecies genetic variations," PeerJ, vol. 8, April 2020.

[13] R. J. Sternberg, "Human intelligence," https://www.britannica.com/science/humanintelligence-psychology/Psychometric-theories