

The concept of intelligence in psychology



The concept of intelligence and understanding the mechanisms that create, sustain and develop it have both captivated and bemused scholars for millennia. For sure, as self-reflexive beings we are destined to comprehend or delineate the question of knowledge; the retention of information – the immaterial – that has a pivotal function in not only creating the psycho-social world but allowing it to evolve. The purpose of this essay is to examine the definitional nightmare that has plagued our conception of what intelligence is or how it should be described, before exploring the contributions made by psychology in capturing and measuring this phenomena. In turn, this essay will explore one of psychology's longstanding dichotomous dilemmas, the 'nature vs. nurture' debate, to explore whether intelligence is an inherent virtue or something ascertained through interaction and culture. This essay is one of exploration, a discovery and piecing-together of various strands within psychology, to provide an account of what intelligence is and its place of origin.

It seems somewhat obvious that our academic ancestors would have been heavily persuaded by the supernatural and otherworldly, before the emergence of scientific discourse and so-called Enlightenment. For Plato (2014), the soul existed independently of the corporeal, imbued with beauty, elegance and knowledge par excellence, residing in the sacred realms of perfect forms and facts before marrying with the body; a metaphorical prison that hindered the soul's quest for actualisation. Thus, intelligence was a process of realisation or recollection, the overcoming of a fickle, polluted, and decaying body to a higher state of becoming; a master artisan of reflexivity or philosopher king (Plato 2014, 88). However, philosophers like

Aristotle (2013) – often regarded as the ‘father of psychology’ – whilst sustaining the Cartesian Dualism somewhat, contended that there was a marriage (hylomorphic) between the mind and body; the former (passive intellect) an infinite and immortal vessel that engages with the former (active intellect) and its five senses to assimilate and project into (inter)action. However intellect (nous) remains an abstruse and spiritualised entity. As Magee (2000) alludes, such philosophical interpretations have an artistic and somewhat godly quality pertaining to intelligence, its origin and ascertainment. The advent of pseudoscience’s like phrenology sought to locate intellect within the details of the human skull; dimples and dents where regarded as proof that human potential could be determined, thereby damming already marginalised groups and heightening the divide across race, class and the sexes (Uttal 2003). The succession of science, whilst discounting religion as an illogical and epistemologically restrictive domain, also had a disenchanting effect (Weber1946) on our understanding of intelligence; placing it within realms of quantification, a variant that could be detailed, standardised, examined and subsequently explained without the need for wonder and mystic. Accordingly, psychology became a prime protagonist in exhuming the mythical and establishing the measurable substance of intelligence, its elemental makeup and related descriptions.

So, what is intelligence? Ironically, this topic remains hotly contested within psychology, though most accept that intellect is a necessary component for adaptation. It requires a host of mental operations (including a malleable brain), physical capabilities and ecological cues to converge – to some extent – in an orchestrated manner, allowing one to synthesise successfully,

advance and ultimately master the environment around them. As the American Psychological Association suggest, it is the “ global capacity to profit from experience” (APA 2015). The work of Piaget (1972) has assisted immensely in our understanding of (child) development and the cognitive-intellectual building blocks or schemas that emerge from birth, his preoccupation with how knowledge grows led to several assertions. In principle, intelligence is the creation of these mental representations through a process of assimilation i. e. the generation and deployment of schemas to manage (new) situations and/or objects, and accommodation which can be likened to schematic adjustments or transformations as new (updated) information is confronted. For Piaget (2001), intelligence is a process of four unique stages of increasing complexity, beginning with the sensorimotor stage at birth where the infant relies heavily on its motor senses to engage with the world, and ending with formal operations stage where the child develops abstract thought, employs deductive reasoning and differentiates oneself from others – progressing from primitive to infinitely complex structures, concepts and coding’s.

Similarly, for Cattell (1963) intelligence may be dissected into two dialectical concepts: the broad function to think logically and problem-solve through unfamiliar processes called fluid intelligence (Gf) and the ability to reason and implement based on previously acquired knowledge or what he called crystallised intelligence (Gc). However these original conceptions have been subsequently expanded to include a whole host of mental abilities (Lubinski 2004), including memory, visual and auditory processing. Yet, interaction with the world demands what Salovey and Mayer (1990) call emotional

intelligence whereby, as social creatures, humans can appropriately gauge and control their own emotive state whilst determining that of others – what Weber (1946) calls ‘*verstehen*’ – to act with purposeful and productive intent both individually and collectively; this requires social learning and a mastery over ones emotive impulses – where biological impulse and society meet, the latter defusing, moulding and directing the former (Lieberman 2013). Indeed, as an extreme example, we discover in psychopaths the inability to form emotional bonds or act empathically, tending to mimic emotive demonstrations (Raine and Glenn 2014), leading to dysfunctional and extremely harmful individuals. Ironically, typical traits of psychopaths include a high level of general intelligence which is understood as the capacity to assimilate, comprehend and apply facts, laws and principles. Indeed, in his psychometric investigations, Spearman (1927) introduced the term general factor (*g*) to denote that humans possessed – to varying degrees – a core construct of cognitive capacity or mental energy. This was assessed by tapping into what he called specific factors (e. g. arithmetic, logic, and written) using a variety of mental tests; his findings showed that those participants demonstrating high performance on specific mental tasks tended to achieve in others. In addition, arguing the case for multiple intelligences, Thorndike (1920) posits an additional social intelligence, which parallels with our capacity as sentient animals, that includes our aptitude for participating and profiting within the social milieu; to act wisely, assimilate norms and values and interact with others. These techniques and interactive strategies are learned through social conditioning and vary across societies (Goleman 2007). Thus, intelligence appears to be multifaceted in its

conceptual makeup, often hierarchical and including subdivisions of specificity.

For cognitive theorists, there has been a tendency for proponents of the psychometrics to focus purely on the realm of conceptual structure whereas they place impetus on uncovering the process through which intelligence is gained; a computer analogy is often deployed to describe how information is processed through various senses, mental nodes and serial formations. Importantly, as Jensen (1987) postulates, mental processing speed may play a pivotal role in intelligence, as well as how effectively we collate, compartmentalise and articulate mental representations of information. Theorists consider the basic components or models of cognition, such as creativity, attention, thinking and perception, and how these function. A variety of computer-like models have been generated as a kind of heuristic device or ideal-type (Huneman 2007) to detail mental procedures. For example, Atkinson and Shiffrin (cited in Ashcraft and Raduansky 2013) outline a multi-stage model of memory that shows various phases through which information is collated, stored and retrieved in a kind of processor-like input-storage-retrieval procedure; a variety of systems, including attention, sensory memory and the rehearsal loop, are involved in deciphering, coding, storing and retrieving memories.

A variety of research conducted on brain-function has provided some concrete evidence for cognitive theories inasmuch as the brain might be divided into sectors of functionality; the temporal lobes are involved in speech, memory and behaviour whereas the frontal lobe has been considered responsible for behaviour, movement and intelligence (Smith and <https://assignbuster.com/the-concept-of-intelligence-in-psychology/>

Kosslyn 2008). Indeed, whilst certain regions of the brain can be attributed with particular tasks, most researchers accept the interconnectedness nature involved in creating intelligence. As Eysenck and Keane (2010) suggest, in order to measure cognitive phenomena and attempt to illuminate the genealogy of intelligence, researchers employ a host of “ mental tests”, including the “ original” Binet-Simon (later Stanford) intelligent quotient (IQ) – originally devised to identify underperforming children – which assesses general components of intellect, to more specific skill-related tests that account for memory, verbal, speed and emotional aptitude. In some cases, such tests have a high level of reliability, validity and standardisation providing a reasonable indicator (correlation) of aptitude and achievement potential. However, such tests have come under considerable criticism, particularly because of their class, race and cultural biases (Greenfield 1997); what should define intelligence and how this should be measured/assessed remains a problematic issue for all testing. Also, appreciating that the mind is a malleable organ and suited to adaptation based on environmental demands, it seems logical that humans will evolve differently across cultures; measures, values and descriptions of intellect will vary accordingly (Nisbett 2009). Similarly, aspects of intellect will be heightened according to environment, for example, in hunter-gatherer societies, spatial awareness and attention may be regarded as more useful tools (and may be accentuated in such cultures) than maths or verbal abilities (Smith and Kosslyn 2008).

Sadly, despite the implementation of scientific measurement, the psychology of intelligence remains somewhat speculative, hypothetical and dependant

on mental constructs. The biological approach to intelligence seeks to place intellect within the realm of hard facts as a means of explaining (rather than describing) behaviour. However, this reductionist view is considered complementary to cognitive models and computer analogies of intelligence (Claxton 2015). Indeed, many studies, using modern technologies like Magnetic Resonance Imaging (MRI) and Positron Emission Tomography (PET), have sought to pinpoint activity within the brain when performing specific tasks as a method of compartmentalising brain function and sources of intelligence. Similarly, there has been considerable research into brainwaves and the effect on task performance and blood-flow as an indicator of mental activity (Devlin and Fienberg 1997). The field of DNA has also revealed the contribution that genes make to intelligence (using various IQ test), especially in adulthood with the implication that we reinforce (or indeed resist) our genes as we develop. Also, investigation into twin studies – particularly identical or dizygotic pairs – has demonstrated a strong correlation (between 70-80% variance) between heritability and intelligence; identical pairs separated at birth show similar readings in intellect whilst adopted children show similarities to that of their birthparents (McCartney et al 1990). Moreover, our understanding of genetic disorders, such as dyslexia and neural diseases like Alzheimer's and Downs Syndrome further illuminate the biological grounding of intelligence and its related brain functions (Slade 2009).

Malyby and Day (2013) has also proposed how cultural influence interacts with the biological. For example, (mal)nutrition, stress and 'mental scars' due to trauma can impede on intelligence; this pertains to various

environmental factors, such as poverty, war and abuse. In fact, as a retort to the biological approach, is the consideration of culture in shaping intelligence. As Skinner (2011, 46) one expounded “ give me a child and I’ll shape him into anything” alluding to the notion that the mind is a tabula rasa awaiting social imbuelement. Yet, as Berg (2012) recounts, the (social) world is an asymmetrical field, where resources or architectural means to reach ones potential are stockpiled in the hands of a few; denoting that social inequality remains an important factor in pedagogic (indeed human) potential, conditioning across race, class and gender boundaries generates specific malignant societal formations that hinder progress. In addition, as Fox et al (2011) demonstrates, those who come from dysfunctional families, where domestic violence is present, or placed in foster care show lower IQ scores than non-institutionalised cohorts of similar attribute or those who are subsequently removed from such environments; these tend to perform better in testing once removed. A classic example of the impact environment has on not only intellect but psychosocial development is that of feral children; these individuals lack a host of higher-intellectual faculties, including human language, empathy and social behaviours (Ashcraft and Radvansky 2003). This illuminates the importance of culture in, at the least, coaxing and facilitating human potentials.

In this essay we have explored the various conceptions and descriptions offered by psychologists and their philosophical ancestors to measure and explain intelligence. In truth, this appears to a definitional nightmare, filled with conjecture or hypothetical formations, though strenuous efforts are made using scientific measures to access the still illusive question of what

intelligence is, a phenomena that has a multitude of variants across a range of societal and cultural spectrums. Yet, psychology has certainly offered an account of what may constitute intelligence, unlike our philosophical ancestors, science has permitted academics to fish through the lens of objectivism to uncover the composition of intelligence and its origin. Indeed, on the issue of nature versus nurture, it is apparent that both are interdependent; biology and genetic factors are certainly prerequisites for development and adaptation but both shaped by and dependant on environmental and social influences. Similarly, on a cellular or neural level, researchers observe the interrelations between various regions of the brain and, whilst on a conceptual level we find that a range of cognitive processes are involved in our intellectual makeup. That said, to what extent remains a mystery; the psychology of intelligence continues to be a best guess, but arguably a respectable one that is under constant scientific revision.

References

American Psychological Association. 2015. Topic in intelligence found at: <http://www.apa.org/topics/intelligence/>. 28th September 2015.

Aristotle. 2013. Reprint. *The Works of Aristotle: The Famous Philosopher*. CreateSpace Independent Publishing Platform

Ashcraft, M. Radvansky, G. 2013. *Cognition*. Pearson Education.

Berg, G. 2012. *Low-Income Students and the Perpetuation of Inequality: Higher Education in America*. Ashgate Press: UK.

Carroll, J. 1993. Human cognitive abilities: A survey of factor-analytical studies. Cambridge University Press: NY.

Cattell, R. 1963. Theory of fluid and crystallized intelligence: A critical experiment. *Journal of Educational Psychology*, Vol 54(1), pp 1-22.

Claxton, G. 2015. *Intelligence in the Flesh: Why Your Mind Needs Your Body Much More Than it Thinks*. Yale University Press.

Devlin, B. Fienberg, S. 1997. *Intelligence, Genes, and Success: Scientists Respond to The Bell Curve*. Copernicus Press.

Eysenck, M. Keane, M. 2010. *Cognitive Psychology: A Student's Handbook*. 6th Edition. Psychology Press: London.

Fox, N. Almas, A. Degnan, K. Nelson, C. Zeanah, C. 2011. The Effects of Severe Psychosocial Deprivation and Foster Care Intervention on Cognitive Development at 8 Years of Age: Findings from the Bucharest Early Intervention Project. *J Child Psychol Psychiatry*. Vol 52(9), pp. 919-928.

Glenn, A. Raine, S. 2014. *Psychopathy: An Introduction to Biological Findings and Their Implications*. NYU Press.

Goleman, D. 2007. *Social Intelligence: The New Science of Human Relationships*. Arrow Publishers.

Greenfield, P. 1997. YOU CAN'T TAKE IT WITH YOU: Why Ability Assessments Don't Cross Cultures. *American Psychologist*. Vol. 52(10), pp. 1115-1124.

Huneman, P. 2007. *Understanding Purpose: Kant and the Philosophy of Biology*. University of Rochester Press.

Jensen, A. 1987. Process differences and individual differences in some cognitive tasks. *Intelligence*. Vol 11(2), pp107-136.

Lieberman, M. 2013. *Social: Why our brains are wired to connect*. Oxford University Press.

Lubinski, D. 2004. Introduction to the Special Section on Cognitive Abilities: 100 Years After Spearman's (1904) "' General Intelligence,' Objectively Determined and Measured". *Journal of Personality and Social Psychology*, Vol 86(1), pp. 96-111.

Magee, B. 2000. 2nd edition. *The Great Philosophers: An Introduction to Western Philosophy*. Oxford University Press, U. S. A.

Maltby, J. Day, L. 2013. *Personality, Individual Differences and Intelligence*. 3rd Edition. Pearson Press.

McCartney, K. Harris, M. Bernieri, F. 1990. Growing up and growing apart: A developmental meta-analysis of twin studies. *Psychological Bulletin*, Vol 107(2), pp. 226-237.

Nisbett, R. 2009. *Intelligence and How to Get it: Why Schools and Cultures Count*. W. W. Norton & Company.

Piaget, J. 2001. *The Psychology of Intelligence*. Routledge

Piaget, J. 1972. *Psychology of the Child*. Basic Books.

Plato. 2014. The Republic. Reprint. CreateSpace Independent Publishing Platform.

Salovey, P. Mayer, J. 1990. Emotional Intelligence. Imagination, Cognition and Personality. Vol 9 (4), pp. 185-211.

Skinner, B. 2011. About Behaviourism. Knopf Doubleday Publishing Group.

Slade, M. 2009. Personal Recovery and Mental Illness: A Guide for Mental Health Professionals. Cambridge University Press.

Smith, E. Kosslyn, S. 2008. Cognitive Psychology: Mind and Brain. 1ST Edition. Pearson Press.

Spearman, C. 1927. The Abilities of Man. American Psychological Association. Vol 67(9), pp56-105.

Thorndike, E. 1920. Intelligence Examinations for College Entrance. The Journal of Educational Research. Vol 1(5), pp329-337.

Uttal, B. 2003. The New Phrenology: The Limits of Localizing Cognitive Processes in the Brain. MIT Press.

Weber, M. 1946. From Max Weber: Essay in sociology (Ed Gerth, H. Mills, C). Oxford University Press: Oxford.