The Issue Of Intelligence: Nature And Nurture

From the ancient to modern period, theories of learning have varied along with the support and criticism of each new theory. Philosophers like Plato and Aristotle have depended on nature or nurture to explained human behavior (Kan et al., 2013, Im et al., 2008). Plato believed knowledge was inborn and that every object in the physical world has corresponding abstract “ideas”/ “form.” Aristotle rejected this notion and believed “knowledge is the result of experience” and that it was obtained from sense experience and reasoning (Olson & Hergenhahn, 2015).In more recent theories, the debate has become more scientific, John Locke who followed Aristotle believed that the mind was a blank slate or tabula rasa to modern scientist who believed genetics (i.e., nature) is the key to human behavior (Cherry, 2020). However, genes can be turned on and off depending on the environmental cues or triggers.

When it comes to the issue of nature or nurture, choosing the right side is not always easy because one variable affects the other. Moreover, the focus is no longer about one versus the other, instead it be should focus on the interaction and how they affect each other. The development and strength of individuals' intelligence depends on how nature and nurture interact (Plomin, 2014, Cherry, 2020). The aim of the following paper is to verify and support the validity of that theory with empirical evidence from both sides of the issue.

The contributions of these philosophers have allowed researchers to study different areas relating to the issue of nature and nurture (e.g., in development and language research). For instance, Frederick II, a medieval emperor conducted a diabolical experiment in attempting to discover what language children would grow up to speak if they were never spoken to. In this experiment, King Frederick took babies from their mothers and placed them in the care of nurses. The nurses were not allowed to speak to the babies. As a result, the babies developed no language, indicating signs of nature—nurture (Steen, 1996). Notably, French philosopher Rene Descartes relied on innate ideas using the concept of God to show evidence of nature influence (Olson & Hergenhahn, 2015).

Literature Review

Intelligence is defined differently across experts in the field of psychology and testing. Alfred Binet, the originator of modern intelligence test, defines intelligence as, “the tendency to take and maintain a definite direction; the capacity to make adaptations for the purpose of attaining a desired end, and the power of autocriticism” Kaplan (2013 cited Terman, 1916, p.45). Based on this definition, Binet wanted to assess how individuals would perform on a scale when given a variety of tests from time to time. Binet and his colleague Theodore Simon were appointed by the French education minister to develop a test that would identify intellectually limited (i.e., mental retardation and learning disabilities) children. The focus was centered on developing a test that would tap into judgment, attention, and reasoning using trial and error and hypothesis-testing procedures (Kaplan, 2013). The scale they developed became known as the Binet-Simon Intelligence Scale and was later renamed Standard-Binet Intelligence Scale. He was guided by two principles in developing measures of intelligence: age differentiation and general mental ability.

Age differentiation is about taking younger and older children by comparing them to abilities of the older children. For example, a six-year old who can perform tasks appropriate for an eight-year old is said to have a mental age of eight. General mental ability measures the total product of various separate and distinct elements of behavior (Kaplan, 2013). Thus, intelligence testing has been used to support nurture on how they developed through age and practice. The work of Binet has shaped the field of psychology testing, and his influence has led other developers in creating their scale for mental measurement.

David Wechsler expanded upon Binet's work and his scale provided an overall score, unlike that of Binet (single overall score). Wechsler used a Point Scale vs. Age Scale and included a performance scale. Binet's scale focused on grouping items by age level and required subjects to pass certain items to receive credit for a test (Kaplan, 2013). Wechsler's scale of measurement became known as the Wechsler Intelligence Adult Intelligence Scale (WAIS), and there have been four different versions of this scale. Today, the current version of this scale consists of four major scores: verbal comprehension, perceptual reasoning, working memory, and processing speed (Cherry, 2020).

Criticism

Standardized intelligence testing has had a wide range of success since its inception. For instance, Alfred Binet scale of measurement has helped school systems identify children with mental retardation and learning disabilities in placing them in the correct curriculum. However, with great success, criticism follows. Critics have claimed that intelligence testing is inadequate and only measures test-taking skills. Also, intelligence testing is biased against certain racial and economic groups (Snyderman, 1987). There is a correlation between socioeconomic backgrounds on all standardized testing Kaplan (2013 cited Bornstein, Hahn, Suwalsky, & Haynes 2003; Hart, Petrill, Deckard & Thompson, 2007).

The Nature Argument

Mankind share a common DNA strand (e.g., eye color, hair texture, and certain predisposed disease) that can be factored into our genes. Those who favor heredity are known as nativists. They believe evolution can explain human behavior and that individual differences are part of what makes a person's genetic code unique (McLeod, 2018). When it comes to intelligence, most researchers have found that brain development can be examined by measuring the size of the brain, and intelligence is found to be correlated with the number of neurons in the brain and the thickness of the cortex (Im, 2008).

The Nurture Argument

On the contrary, those who favor environmental factors are known as empiricists. Their assumption is that at birth, the mind is a tabula rasa /blank slate (Cherry, 2020). They believe environmental influence is the root to all behaviors. Behaviorist John B. Watson supported the theory of nurture and through conditioning, he believed that people can be wired to be anything that he desires them to be:

"Give me a dozen healthy infants, well-formed, and my own specified world to bring them up in and I'll guarantee to take any one at random and train him to become any type of specialist I

might select – doctor, lawyer, artist, merchant-chief and, yes, even beggar-man and thief, regardless of his talents, penchants, tendencies, abilities, vocations, and race of his ancestors. I am going beyond my facts and I admit it, but so have the advocates of the contrary and they have been doing it for many thousands of years" (Papierno et al., 2005, p.128).

He attempted to test his famous statement by constructing an experiment that would later become controversial called "The Little Albert". Watson conducted this experiment using an eleven-month-old infant boy named Albert. At the onset of the experiment, Albert was exposed to a various of stimuli (e.g., a white rat, rabbit, monkey, and masks) and showed no fear. As the experiment processed, he developed a fear. When the stimulus (i.e., white rat) was paired repeatedly with a loud noise (i.e., hammer and steel bar), the infant began to cry after seeing the rat. As a result, Little Albert was conditioned to any furry objects (e.g., rabbit, dog, fur coat, cotton, and Santa clause mask). This experiment showed how human behavior is altered in the environment through conditioning (Olson & Hergenhahn, 2015).

Meeting in the Middle

Researchers have commonly used twin studies to address the issue of nature or nurture when it comes to intelligence. Studies have shown that when one set of identical twins developed a predisposed disease (e.g., schizophrenia), there's a fifty-percent chance of the other twin inheriting that same condition (Anonymous, 2005). Fraternal twins, however, have about a sixteen-percent chance (2005). Overall, there is no direct way of solving the prominent issue whether intelligence depends more on nature/nurture, but the only solution is to look at the interaction (Cherry, 2020). Clearly, they are both responsible for intelligence.

Conclusion

The issue of nature or nurture cannot stand on its own; they are both equally responsible for intelligence. From the time this issue originated, most philosophers (i.e., Plato and Descartes) favored nature but other philosophers (i.e., Aristotle and Locke) challenged this notion and justified environmental factors as the root to all behaviors. Moreover, researchers have used intelligence testing to support this theory.

Intelligence research can be utilized in an academic setting in understanding students' strength and weakness where environmental (e.g., school) and genetics (e.g., family background) interact. As a researcher, applying the concept of nature and nurture in the workplace will be essential when it comes to working in the field of industrial organizational psychology (IWO). For instance, having to knowing the background and strength of each candidate will help narrow down the process of choosing the appropriate candidate for the job.

Alfred Binet scale of measurement has helped reformed school testing by identifying children with mental disabilities and placing them in the right curriculum. His scale of measurement was based on the concept of mental age. This scale estimates the mental age of a child by comparing them to the average performance of a child age. Binet scale of measurement has influence other intelligence testing (e.g., the David Wechsler measurement scale). Today, most of these intelligence tests have been used and criticized. Critics have claimed that intelligence testing only measures test-taking skills and are biased against certain racial and economic groups.

Besides intelligence testing, twins’ studies have been the most effective to the issue of nature or nurture. For instance, when it comes to a certain predisposed disease, there’s always that fifty-percent chance of the other twin inheriting that gene. Thus, it’s not about “how much” or “which one is important” they both played a role in shaping each individual. In addition, heights and weights are affected by nature and nurture.