

## **THE PROBLEMATIC SEARCH FOR THE NATURE OF INTELLIGENCE: PHILOSOPHICAL REACTIONS AND PROJECTIONS**

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### ***ABSTRACT***

The question, "What is intelligence?" is deceptively simple. However, scholars have engaged in series of research in order to answer it. Till date there is no simple answer accepted by experts in the relevant disciplines. Attempt to identify a standard definition has been very challenging. This failure is connected with the fact that defining intelligence requires the application of problematic and abstract concepts. Consequently, some researchers decided to put forward theories as an attempt to capture the nature of intelligence. However, this option, as reflected in this paper, further deepens the problem it purports to resolve. The paper is an inquest into the intellectual travails of scholars who fruitlessly attempted to grasp the nature of intelligence. The paper avers that these travails are caused by scholar's reliance on ontological proof of intelligence which stipulates the possession of brain and mind as evidence of intelligence. The epistemological proof which relies on overt behaviour as index of interpreting intelligence is projected by the paper as a plausible means of overcoming the nebulous nature of the concept.

*Keywords: Intelligence, Panacea, Green, Environment.*

### **INTRODUCTION**

An ontological proof of intelligence focuses on the phenomenon responsible for what is perceived as intelligence. Such phenomena are generally conceived as brain and mind. Consequently, advocates of this channel of understanding intelligence simply offer definitions or theories of the term that are anchored on brain or mind possession. This paper reveals that this approach inherits the philosophical hangover of the complexity and perplexities

associated with the discourse on brain and mind themselves. The epistemological proof which is an alternative approach conceives intelligence in term of overt behaviour. Philosophical behaviourism is introduced as a theoretical framework for this approach. Consequently, behaviourist inclined scholars aver that definitions, notions or theories of intelligence should be anchored on overt behaviour.

After weighing the two approaches, albeit philosophically, this paper concludes that the scientific element in the epistemological approach provides the avenue for a robust and simpler way of understanding intelligence. In justifying this conclusion, the paper is systematically divided into three sections. In the first section, various definitions of intelligence, as culled from wide range of literatures on the subject shall be critically examined. The objective is to reveal how it has been impossible to arrive at a universally acceptable definition of the concept. Theories of intelligence as offered by scholars in related disciplines shall be put forward for critical scrutiny in the second section. In the final section, the weaknesses of these theories and the problem of non-availability of universal definition of intelligence shall be traced to the complexity and perplexities of understanding the human brain and mind. The section shall further engage in the behaviourist interpretation of intelligence.

## DEFINITIONS OF INTELLIGENCE

The systematic search for comprehensive and scientific understanding of intelligence and its development has been a major pursuit of psychologists for over a century (Weinberg, 1989:98). Perhaps, due to the complex and elusive nature of the concept, the effort is yet to yield a universally accepted definition. A convenient technique used by researchers in this domain is the articulation of working definitions that can suit their purposes. However, P.A. Vroon (1980:1) points out that daily usage of the word rarely provides a clear definition of the term. In 1904, C.E. Spearman advances the definition that intelligence is the tendency of all human abilities to be positively correlated (quoted in Saggina et al, 2006:3). This definition amounts to claiming that if an individual is found to be good at one thing there is tendency for him to be good at other things. L. Gottfredson, in collaboration with fifty-two experts in the field, defines intelligence as “a very general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience” (Gottfredson, 1997:13). The notion that intelligence is a single unitary ability has been a source of heated debate among practitioners in the field. A. Anatasi, avers that “Intelligence is not a single, unitary ability, but rather a composite of

several functions" (Anatasi, 1992:610). For him, intelligence denotes that combination of abilities required for survival and advancement within a particular culture.

A. Binet and T. Simon propose that intelligence is a fundamental faculty that is crucial to practical life. In their words, "This faculty is judgement, otherwise called good sense, practical sense, initiative, the faculty of adapting one's self to circumstance" (quoted in Legg and Hutter, 2007:5). J. Person conceives intelligence as "a biological mechanism by which the effect of a complexity of stimuli are brought together and given a somewhat unified effect in behaviour" (quoted in Legg and Hutter, 2007:5).

D. Wechsler and D. Simonton also lay emphasis on the relation between intelligence and the ability to adjust to environment. Wechsler defines intelligence as the "aggregate or global capacity of the individual to act purposefully, to think rationally and to deal effectively with the environment (Wechsler, 1975:135). In Simonton's view, intelligence is "certain set of cognitive capacities that enable individuals to adapt and thrive in any given environment they find themselves in" (Simonton, 2003:n.p). Unlike Wechsler and Simonton, P. Kine gives primacy to learning. For him, "intelligence is popularly defined as the ability to learn, understand and deal with novel situations" (Kline, 1991:1). As for A. Antonov, "thinking" should be the right criterion for intelligence. Consequently, he avers that "Human intelligence is a scope of all types of human thinking. That is, we shall include into intellectual human activity not only rational thinking, but also emotional thinking, unconscious thinking, intuitive thinking, and automatic control of biological system" (Antonov, 2011:164).

Interestingly, D.W. Pyle argues that "The short answer to the question 'What is intelligence?' is that we are just not sure!" (Pyle, 1979:1). He argues that the word "intelligence" is a "situation-specific" word. That is, the word is used in various situations (rightly or wrongly) and, thus, takes on various meanings depending upon the particular situation (Pyle, 1).

To a large extent, the orientation or perspective adopted by a researcher or writer determines the notion of intelligence he or she adopts. Thus, the biologist would stress the ability to adapt to the demands of the environment; the educationalist the ability to learn; some psychologists emphasise the measurement of the ability to reason and other cognitive functions; others the development of these functions; and probably the layman would mumble something about commonsense' (Pyle, 3).

Oftentimes, researchers (for instance Spearman) tend to use the term “intelligence” as a noun, thereby creating the erroneous impression that it is a concrete entity. This approach usually makes us think that the word is referring to something tangible and concrete (a quantity of something in the brain, perhaps) (Pyle, 5). However, a more appropriate way of using the word, as far as Pyle is concerned, is to consider it as an adjective meant to qualify human behaviour. For him, “intelligence is rather a matter of ways of behaving and acting, and not something that a person has” (Pyle, 5).

Now, since intelligence is culture bound, variance in definitions is inevitable; any definition of intelligence must take into account the culture in which an individual is reared. Intelligence is inextricably interwoven with the beliefs, values, language, concepts and orientations of a particular group or race of people (Pyle, 6). This means that a particular definition of intelligence may be suitable for one cultural group and unsuitable for another. Sometimes too, the way in which a particular definition is applicable to one cultural group may be different from another. The *American Heritage Dictionary* (4th edition) for instance advances that intelligence is “The capacity to acquire and apply knowledge”. Given that what constitute knowledge, to an Australian Aborigine, may not be so to the average American living in New York, a grade “A” American college student might not be deemed intelligent by the Aborigine, and vice versa. This popular example shows that linking intelligence with knowledge acquisition and usage does not conclusively determine the meaning of intelligence.

Despite the difficulty surrounding the attempt to arrive at a universally acceptable definition of intelligence, researchers remain undaunted in their desire to unravel its nature and essential characteristics. To this end, some scholars endeavour to offer theories to capture the essence of intelligence.

## THEORIES OF INTELLIGENCE

Generally, theories of intelligence can be assigned to one of two camps, “lumpers” or “splitters”. Lumpers, (for instance Spearman) define intelligence as a general unified capacity for acquiring knowledge, reasoning, and solving problems that is demonstrated in different ways (Weinberg, 98). The splitter, such as L. Thurstone, R.J. Sternberg, J.P. Guilford and H. Gardner hold that intelligence is composed of many separate mental abilities that operate more or less independently (Weinberg, 99).

## CHARLES SPEARMAN’S “G” FACTOR THEORY

At the beginning of 20<sup>th</sup> century, a British psychologist, Charles Spearman, put forward the theory that intelligence is one general mental capability underlying human performances on all intellectual tasks. His conclusion was based on the observation that individuals who scored highly in one test of mental ability tend to score high in other tests while those who scored low in a specific test equally performed poorly in other tests. This suggests that all tests of mental ability were positively correlated.

Spearman reasoned that if all mental tests were positively correlated, there must be a common variable or factor producing the positive correlations. Consequently, employing a psychometric method of factor analysis, Spearman proposed that two factors could account for individual differences in scores arising or derived from mental tests. He called the first factor "general intelligence" or the "general factor" represented as "g". According to Spearman, "g" underlies all intellectual tasks and mental abilities. The "g" factor represents what all the mental tests had in common (Detterman, 2008:n.p). Spearman considers "g" as "mental energy" and states that it was the "leading part of intelligence, as is displayed by the ability to handle not merely abstract ideas, but above all symbols" (Spearman, 1927:211).

The second factor Spearman identified was the "Specific factor" or "s". The specific factor relates to whatever unique abilities a particular test required; as a result it differs from test to test (Detterman, n.p). However, the attention of Spearman was more focused on general intelligence.

Since its proposal in 1904, the general factor of intelligence ("g") has generated considerable controversy (Kane & Brand, 2003:7). Indeed, the belief in general intelligence, going by R. Weinberg, has historically been the primary justification for using a single index of intelligence, the IQ (intelligence quotient), for a variety of assessment purposes (Weinberg, 99). H. Kane and C. Brand observe that, "central to any empirically based model of intelligence is the crucial position and function of Spearman's "g" factor. Spearman's "g" routinely accounts for more variance than all other cognitive factors combined, and therefore assumes a position of hierarchical prominence in any model depicting the structure of human cognitive abilities" (Kane & Brand, 21). Its popularity notwithstanding, critics of Spearman's "g" factor maintain that it does not provide the true picture of the nature of intelligence. Intelligence is manifested in different ways (Thurstone, 1938; Gardner, 1993). Moreover, a number of studies have failed to show the consistency of performances across tests.

## LOUIS THURSTONE'S MULTIPLE FACTORS THEORY

In 1938, an American psychologist Louis Thurstone carried out an experiment which appears to disprove Spearman's "g" factor. The experiment highlighted seven independent factors as the foundation of intelligence rather than the much held general factor.

Thurstone calls his newly discovered factors "primary mental abilities". To identify these abilities, he and his wife, Thelma, devised a set of 56 tests. They administered the battery of tests to 240 college students and analysed the resulting test scores with new methods of factor analysis that Thurstone had devised. Thurstone identified seven primary mental abilities: (1) verbal comprehension, the ability to understand word meanings; (2) verbal fluency, or speed with verbal material, as in making rhymes; (3) numeracy or arithmetical ability; (4) memory, the ability to remember words, letters, numbers, and images; (5) perceptual speed, the ability to quickly distinguish visual details and perceive similarities and differences between objects; (6) inductive reasoning, or deriving general ideas and rules from specific information; and (7) Spatial visualization, the ability to mentally visualize and manipulate objects in three dimensions (Thurstone, quoted in Detterman, n.p). At least one of these primary mental abilities leads to variation in the results of intellectual tasks.

Although, Thurstone's hypothesis on multiple factors was initially vindicated by his intelligence test conducted on college students, anomalies reared up when the test was extended to an intellectually heterogeneous group and individuals in the general population. The new test produced a result that re-affirms Spearman's "g" factor theory. It was therefore observed that the restriction Thurstone placed on the range of subject selected for the test led to his failure to arrive at general intelligence in the first place. D. Detterman reiterates the problem with Thurstone's theory with the observation that even in college students, the tests that Thurstone used were still correlated. He argued that the method of factor analysis that Thurstone devised made the correlations harder to identify. As a matter of fact, when other researcher reanalyzed his data using different methods of factor analysis, more correlations became apparent. The researchers concluded that Thurstone's battery of tests identified the same "g" factor that Spearman had identified (Detterman, n.p).

Despite the shortcomings of Thurstone's Multiple Factor approach to intelligence, the theory turns out to be a catalyst to the development of theories on multiple intelligences. The likes of J.P. Guilford, R.J. Sternberg and H. Gardner were inheritors and developers of Thurstone's idea on intelligence.

## JOY GUILFORD'S STRUCTURE OF INTELLECT THEORY

Like his American counterpart, Thurstone, Joy Paul Guilford rejected Spearman's view that intelligence could be characterized by the single "g" factor. For him, Human intelligence is divergent in nature. In 1967, Guilford explicated his idea of intelligence in what he calls 'structure of intellect' theory.

Guilford describes the structure of intelligence as manifested in different abilities. These abilities are in three dimensions, namely, content, product, and operation. He develops tests for each possible combination of these dimensions, based on the belief that an individual could perhaps score high on some of these abilities and less on others.

Under "content", Guilford identified five different forms of information that an individual may process comfortably. These are (i) "visual" information which depends on the sense of sight, (ii) "auditory" information obtained through the sense of hearing, (iii) "symbolic" information derived from the power to interpret symbols, (iv) "semantic" information based on the power to interpret words or sentences, and (v) "behavioural" information obtained through the power to interpret the mental states and behaviour of observed individuals. Guilford believes that an individual may be good at processing symbolic information (for instance a poet) but may be poor at visual information where an artist usually excels.

An individual's intelligence can also be informed by the kind of "product" he is processing. Products include units, classes, relations, systems, transformations and implications. Thus, an individual may express creativity in perceiving visual units such as shapes or even behavioural units such as facial expressions, and so on. While the two dimensions discussed above, can be used to sort out the different kinds of information we can think about, the "operation" dimension simply describes what the brain does with these information. The brain could use them to perform the following functions: cognition, memory, divergent production, convergent production, and evaluation. Thus, an individual may exhibit intelligence in the cognition of semantic units, cognition of behavioural transformation, and so on. Another individual may be good at retrieving information from memory.

H. Kane and C. Brand (2003) suggest that Guilford's theory of intelligence completely removes the possibility of Spearman's general factor of intelligence. The theory eventually gained wide acceptance, especially with educators and social environmentalists who consider the possibility of a biologically based general factor unpalatable (Kane and Brand, 2003:10). However, the theory has been criticized on the ground that it is unnecessarily complex and, hence, violates the rules of parsimony. There is also the problem of replicating

Guilford's result upon re-analysis, thereby raising the question of the reliability of his instruments (Kane and Brand, 2003). R. Sternberg, another American psychologist, advanced a less cumbersome theory.

### **ROBERT STERNBERG'S "TRIARCHIC MIND" THEORY**

Robert Sternberg propounded a three-sided theory of intelligence. According to him, intelligence is built on three cornerstones (Weinberg, 1989). The first is that intelligence cannot be understood outside of a socio-cultural context. What is "intelligence" in one environment may be irrelevant in another. Thus, the ability to adapt to one's environment is an important aspect of intelligence. The second is that intelligence is purposeful, goal-oriented relevant behaviour consisting of two general skills: the ability to deal with novel tasks and the ability to develop expertise, that is, the ability to learn from experience to perform mental tasks effortlessly or automatically. Thirdly, intelligence depends on acquiring information-processing skills and strategies.

It is against this backdrop that Sternberg posits three categories according to which intelligence can be classified. These are: analytical, creative and practical abilities. He contends that intelligence behaviour arises from a balance between them. Furthermore, these abilities function collectively to allow individuals to achieve success within particular socio-cultural contexts. Analytical abilities enable the individuals to evaluate, analyze, compare and contrast information. Creative abilities generate invention, discovery, and other creative endeavours. Practical abilities tie everything together by allowing individuals to apply what they have learned in the appropriate setting. To be successful in life the individual must make the best use of his or her analytical, creative and practical strengths, while at the same time compensating for weaknesses in any of these areas. This might involve working on improving weak areas to become better adapted to the needs of a particular environment, or choosing to work in an environment that values the individual's particular strengths. A person with highly developed analytical and practical abilities may find it difficult to work in a field that demands above-average ability in creative thinking. However, if the person chooses a career that requires creative abilities, the individual can use his or her analytical strength to come up with strategies for improving this weakness. Thus, a central feature of the Sternberg's theory of successful intelligence is adaptability both within the individual and within the individual's socio-cultural context (Sternberg, reviewed in Plucker, 2003).

We can commend Sternberg's effort on the ground that he is able to broaden the domain of intelligence to correspond more with what people frequently think intelligence is. However, critics believe that scientific studies do not

support Sternberg's classification of intelligence. For example, some scholars propose that practical intelligence is not a distinct aspect of intelligence, but a set of abilities predicated by general intelligence (Detterman, 2008:n.p).

## HOWARD GARDNER'S THEORY OF MULTIPLE INTELLIGENCES

One of the most popular theories on the multiplicity of intelligence was put forward by the American cognitive psychologist, Howard Gardner. In his magnum opus *Frames of Mind* (1993), Gardner posits "Theory of Multiple Intelligences", which incorporates linguistic intelligence, musical intelligence, logical-mathematical intelligence, spatial intelligence, intrapersonal intelligence, interpersonal intelligence and naturalist intelligence. Gardner writes that "There are at least eight discrete intelligences, and these intelligences constitute the ways in which individuals take in information, retain and manipulate that information, and demonstrate their understandings (and misunderstandings) to themselves and others" (Gardner & Veenema, 1996:70). Thus, Gardner's theory does not reckon with the notion of the "g" factor as the underlying element behind information processing.

In formulating his theory, Gardner places less emphasis on explaining the results of mental tests than on accounting for the range of human abilities that exist across cultures. He drew on diverse sources of evidence to determine the number of intelligences in his theory. For example, he examined studies of brain-damaged people who had lost one ability such as spatial thinking, but retained another, such as language. The fact that two abilities could operate independently of one another suggested the existence of separate intelligences. Gardner also proposes that evidence for multiple intelligences comes from prodigies and savants. Prodigies are individuals who show an exceptional talent in a specific area at a young age, but who are normal in other aspects. Savants are people who score low on IQ tests – and who may have only limited language or social skills- but demonstrate some remarkable ability, such as extra-ordinary memory or drawing ability. To Gardner, the presence of certain high-level abilities in the absence of other abilities also suggested the existence of multiple intelligences (Detterman, 2008:n.p). Consequently, he avers that human beings are better thought of as possessing multiplicity of intelligences rather than a single general intelligence put forward by Spearman.

Gardner further makes it clear that his theory makes two strong fundamental claims:

The first claim is that all human beings possess all of these intelligences: indeed, they can be considered a

definition of 'homo-sapiens', cognitively speaking. The second claim is that, just as we look different and have different personalities and temperaments, we also exhibit different profiles of intelligences. No two individuals, not even identical twins or clones, have exactly the same amalgam of intelligences, foregrounding the same strengths and weaknesses. This is because, even in the case of identical genetic heritage, individuals undergo different experiences and also seek to distinguish their profiles from one another (Gardner, 1998/2004:4).

The mark of being human is the possession of these eight intelligences even though they are exhibited in profiles that vary from individual to individual. Logical-Mathematical Intelligence permits individuals to use and appreciate relations; Musical Intelligence makes it possible for individuals to create, communicate, and understand meanings generated from sound; Spatial Intelligence permits individuals to perceive and transform spatial information and recreate visual images from memory; Bodily-Kinaesthetic Intelligence permits individuals to use all or parts of the body to create products or solve problems; Intrapersonal Intelligence helps individuals to distinguish among their own feelings, to build accurate mental models of themselves, and to draw on these models to make decisions; Interpersonal Intelligence enables individuals to recognize and make distinctions about others feelings and interventions; and Naturalist Intelligence which allows people to distinguish among, classify, and use features of the environment (Gardner, 1993; Veenema et al, 1997).

Although Gardner's theory was enthusiastically accepted by educators because it suggests a wider goal than adopted in traditional education (Detterman, 2008), it has been severely criticised. It has been argued that Gardner interpreted intelligence in his theory to depict human ability; the eight forms of intelligence are mere expressions of individuals' ability. Gardner's theory lacks empirical support since its fundamental postulations are not backed by rigorous experimental findings. Besides, Gardner is yet to advance any test with which to measure each of the intelligences (Detterman, 2008). This brings us to the perplexing philosophical debate over the use of intelligence test as an approach to proving and as well measuring intelligence.

**ONTOLOGICAL      VERSUS      EPISTEMOLOGICAL      PROOF      OF  
INTELLIGENCE**

Throughout our discourse on definitions and theories of intelligence, a fundamental perspective about the nature of the subject matter continues to recur. This is the notion that intelligence is a mental capacity employed by humans to deal effectively with the environment, solve problems, adapt to situations and learn (Antonov, 2011; Gottfredson, 1997; Guilford, 1967; Kline, 1991; Simonton, 2003; Spearman, 1927). As a mental act, intelligence is traditionally seen as an object belonging to or originating from the human brain (Pyle, 1979:5); or a product of the human mind (Searle, 1980:434). On this ground, the proof of intelligence, it is argued, lies in the possession of brain and mind (Searle, 1980).

While agreeing that intelligence is indeed a mental act, some scholars who proffered different theories on human intelligence also advanced cognitive tests of behavioural disposition as proof of intelligence (Guilford, 1967; Spearman, 1927; Thurstone, 1938). Consequently, there are two possible proofs of human intelligence: the ontological proof, which stipulates the possession of brain and mind, and epistemological proof anchored on the exhibition of appropriate behavioural disposition.

## **THE ONTOLOGICAL PERSPECTIVES ON INTELLIGENCE: THE MIND-BRAIN FACTOR**

A typical ontological argument of intelligence possession runs thus:

**P1** Intelligence is a mental act

**P2** Mind and brain is the seat of mental act

**Therefore**, mind and brain possession is the hallmark of intelligence.

The thrust of the argument above is that an agent must of necessity possess brain and mind before it could be deemed intelligent. The various definitions and theories of intelligence so far reviewed reveal that intelligence essentially plays the critical role of aiding humans to relate effectively with the environment, solve problems, adapt to varying situations, learn, etc. A closer examination of these roles shows that they actually presuppose certain mental phenomena such as believing, deliberating, feeling, knowing, deciding, choosing, etc. A presumed intelligent agent that wants to “solve a problem”, for instance, is expected to (i) have an understanding of the problem in question, (ii) possess the ability to reflect about various possible solutions to the problem,

(iii) possess the will to choose an appropriate solution and then execute. Eventually, when the problem is solved, the agent is described as intelligent. The processes outlined above are characterized by mental activities.

John Searle, an American philosopher, identifies certain features of mental phenomena that he considered critical to intelligence. These are consciousness, intentionality and subjectivity. Describing what consciousness is can be very challenging. Searle himself complained that "I believe it is, by the way, something of a scandal that contemporary discussions in philosophy and psychology have so little of interest to tell us about consciousness" (Searle, 1984, quoted in Stumpf, 1993:482). David Chalmers sounds even more perplexed about this phenomenon. In his words: "Consciousness can be startlingly intense. It is the most vivid of phenomena; nothing is more real to us. But it can be frustratingly diaphanous" (Chalmers, 1996: 3). However, for the present purpose, we take consciousness to be a mental act of awareness, thinking process or sensation. In this regard, an entity is expected to have sense of awareness, capable of thinking or have sensation in order to exhibit intelligence.

Intentionality is easier to explain than consciousness. It is, according to Searle, the feature by which our mental states are directed at, or about, or refer to, or are of objects and states of affairs in the world other than themselves. Intentionality does not merely refer to intentions, but also to beliefs, desires, hopes, fears, love, hate, lust, disgust, shame, pride, irritation, amusement, and all those mental states (whether conscious or unconscious) that refer to, or are about the world (Searle, 1984, quoted in Stumpf 1993:482). According to Searle, being intelligent is to be in a mental state that is directed at states of affairs in the world.

The subjectivity of mental states, sometimes referred to as "qualia", denotes the unique experience of each individual when in a mental state. According to Searle, this subjectivity is marked by such facts as that I can feel my pains, and you can't. I see the world from my point of view; you see it from your point of view. I am aware of myself and my internal mental states, as quite distinct from the selves and mental states of other people (Searle, 1984). It is presumed that an intelligent agent should have its own subjective experience and on its basis makes decisions.

All mental phenomena including intelligence are believed to be anchored on consciousness, intentionality and subjectivity. In philosophical discourse concerning the origin of thought, these three features are considered as properties of mind and brain. Similarly, intelligence is rooted in the possession of mind and brain, since they are characterized by features that make intelligence possible. Consequently, the possession of mind and brain is

fundamental to the possession of intelligence. This view, however, raises some critical questions. Consider the following:

- i. If mental acts that necessitate intelligence originate from the “mind” then what is the nature of the “mind”?
- ii. If mental acts that indicate intelligence originate from the “brain”, then how can the brain, a material substance, account for mental acts?

Depending on an individual’s metaphysical orientation as either an idealist or materialist, all mental acts may be viewed as activities of the mind or as an epiphenomenon of the brain. However, arriving at correct answers to the questions above constitutes a source of serious debate in philosophy and other related areas. For epiphenomenalists, it is very challenging to explain how the human brain, a material substance, causes mental acts. It is equally difficult determining or pinning down the nature and workings of the human mind due to its subjective nature. William Morris argues that most of us would defend to the last ditch the existence and worth of our minds, but we easily become embarrassed if we are asked to say very much about the nature of that mind which we hotly defend (Morris, 1929: 153). He warns that “in raising the problem of the nature of mind, we are plunged into a problem of the greatest difficulty and of the deepest importance” (Morris, 153).

Theories formulated to explain the mind can be grouped into three classes, which are (i) mind as substance, (ii) mind as organic or personal unity and (iii) mind as an association of experience (Titus, 1959: 155).

#### **i. Substance Theory of Mind**

According to this theory, the mind is one of the underlying realities or qualities which man is made of. The mind is a non-material aspect of man, the other being the body. Plato and Rene Descartes are two foremost advocates of this theory. Plato considers the human mind or soul as an indivisible substance that pre-existed in a super-sensible world of ideas but which unites with the human body to form the human person in the sensible world. At death, the soul shall survive the body due to its immaterial nature. The soul at this point has achieved purification. In *Phaedo*, Plato explains that purification is the “separation of the soul from the body... the habit of the soul gathering and collecting herself into herself from all sides out of the body; the dwelling in her own place alone, as in another life” (quoted in Stumpf, 904). The soul itself is the abode of reason, emotion and sensual feeling. Each of these corresponds with the rational, spirited and the appetitive parts of the soul as characterized by Plato.

Influenced by Plato's thought, Descartes also offered a substance theory of mind. Beginning with the "methodic doubt" he decided to cast everything aside and begin anew in the quest for an indubitable starting point or foundation of knowledge. The first indubitable reality he discovered was the self. Descartes reports his discovery in his famous saying "cogito ergo sum", ("I think; therefore I am"). From the "cogito", it follows that human personality or individuality is a basic fact. Descartes subsequently affirms the existence of God, who is the ultimate generator of our knowledge and of an external world of matter. Cartesian metaphysics posits two substances, mind and matter. The mind is immaterial; it is conscious, and its main characteristic is thinking. Since it is a substance, it cannot be destroyed except by God, who is the only self-existent substance. The fundamental characteristic of matter is extension. Man's body is a part of the world of matter and is subject to its mechanical laws (Titus, 156).

#### **ii. Mind as Organic or Personal Unity**

This theory takes the mind as the immaterial element in man that organizes human experience. Immanuel Kant who rejected the substance theory of mind is associated with the organic theory. He argues that the organization of experiences in various ways is made possible by a principle or agent called the mind. He explains this in terms of "synthetic, unity of apperception" or "transcendental unity of apperception". There is an organic or personal unity which transcends or surpasses the separate experiences. This unity we call the self. The self, or the soul, is sometimes spoken of as the seat of the forms of knowing.

For Kant, the mind is active; it organises systematically all the materials presented by the various senses to yield knowledge of the phenomena. According to him, time and space and other categories are forms of the mind which transforms the manifold presentations of the senses into intelligible and knowable reality. Mind is not a separate mental substance; it is the organization and unity of man's personal experiences (Titus, 156).

#### **iii. Mind as an Association of Experience**

David Hume, an eighteenth century British empiricist advanced the theory of mind as an association of experience. The mind and the faculties of the mental life are nothing but an association of ideas. Mind is a term for the sum total of experiences, or a collection of sensations (Titus, 157). A reflection on

what lies within us does not point to any substance but rather to fleeting experiences or collection of sensations.

While the theories examined above may differ in their conception of "mind", they all characterised it as an immaterial element associated with humans. Having presented intelligence as a mental act, it could be seen as appropriate to trace its origin to the immaterial mind. However, materialists (or physicalists) insist that it is the by-product of brain activity. Such philosophers argue that all mental phenomena or activities of the mind actually originate from the brain. Intelligence is thus a product of the brain and not the mind, in the final analysis.

Epiphenomenalism is an exemplar of the materialist theory of mind. According to this view, consciousness, mind, all mental acts whatever, are secondary phenomena accompanying some bodily processes. Mental processes causally influence neither the physical processes nor even other mental phenomena. Matter is primary, the one real substance. The stream of consciousness is a phenomenon accompanying certain neurological changes. Thus the mind is an effect, an important effect for that matter, which appears under some conditions. Certain processes taking place in the brain and nervous system produce the sensations, feelings, emotion, imagery, thought, or other types of consciousness that we experience (Titus: 163). In his "Minds, Brains and Science", John Searle emphatically states that "... all mental phenomena whether conscious or unconscious, visual or auditory, pains, tickles, itches, thoughts, indeed, all of our mental life, are caused by processes going on in the brain" (quoted in Stumpf, 483). Indeed, Searle's claim and that of other materialists on this issue tend to rely on advancement in brain research. For example, scientists have studied people who have suffered damage to various portions of the brain and have found that different kinds of brain damage produce regular and specific breakdown in a person's cognitive and psychological functioning. Also, detailed studies of normal brains with our sophisticated medical instruments shows that when a person is performing certain task (imagining a scene, speaking, calculating a sum), characteristic changes take place in the brain (Lawhead, 2003: 218).

Consequently, from the physicalist or materialist point of view, to know that an entity is intelligent, all that is needed is detailed study of the brain of the entity. The human brain, unlike the mind, is amenable to objective investigation. Some objections, however, weakens this seemingly attractive position of physicalism.

The biologist, J.B. Haldane, criticises the materialist interpretation of mind thus:

It seems to me immensely unlikely that mind is a mere by-product of matter. For if my mental processes are determined wholly by the motion of atoms in my brain, I have no reason to suppose that my beliefs are true... and hence I have no reason for supposing my brain to be composed of atoms (Quoted in Lawhead, 229).

If Haldane's argument is sound, then it would be impossible to hold any form of belief whatsoever if we take the materialist's position to its logical conclusion. A popular criticism against the materialist is the argument that brain states are not identical with mental states. Paul Churchland argues that:

Brain states and processes must of course have some specific spatial location: in the brain as a whole, or in some part of it. And if mental states are identical with brain states, then they must have the very same spatial location. But it is literally meaningless... to say that my feeling-of-pain is located in my ventral thalamus, or that my belief - that - the sun - is - a - star is located in the temporal lobe of my left cerebral hemisphere. Such claims are as meaningless as the claim that the number 5 is green, or that love weighs twenty grams (Churchland, 1984:29).

Chen Gang (2005) supports Churchland's argument by making a distinction between physical state or event and mental state or event. A physical event is what we observe from an external point of view. It is public to all of us. A mental event is what we actually perceive from an internal point of view. Thus, if we subject an individual who is in pain to a test of brain observation, we can never have direct access to his feeling about this pain or the pain itself. Gang argues that we cannot have direct reliable means into the individual's pain. The best we can get is an indirect unreliable means, i.e., by observing the patterns of neural firings and blood circulation in certain district of the brain, and the mapping between mental events and neural events accumulated in the past. The mapping is not reliable since there is some kind of plasticity in the human brain. Brain surgery has proved that, after the removal of one hemisphere, some of its functions can be recovered in the other hemisphere. This is so-called "multiple-realization" phenomenon. Therefore, there is no general psycho-

physical law to support this kind of mapping (Gang, 2005:3). The argument is further strengthened with the explanation that even when brain process is observed, it is still not mental event that is being observed but rather another form of physical event. A contemporary philosopher of mind, David Chalmers, comments about the futility in studying consciousness through brain process thus: "We have good reason to believe that consciousness arises from physical systems such as brains, but we have little idea how it arises, or why it exists at all. How could a physical system such as a brain also be an experiencer?" (1996: xi).

It is apparent that neither the idealist nor the materialist has solved the problem of the nature and origin of mental acts. Consequently, it still remains debateable to claim either that intelligence as a mental phenomenon originates from the mind or that it originates from the brain. We are yet to have the final answer on the nature of the mind (the supposedly ontological origin of intelligence); or offer plausible explanation of how intelligence, a mental phenomenon, or any mental phenomenon for that matter can be ascribed to brain process.

Two notable twentieth-century philosophers, the American, John Dewey and the British, Gilbert Ryle offer the reason why the search for the proof of intelligence and other mental phenomena should shift from ontological direction to epistemological direction. Their stance revolves around the notion that the evidence of mental phenomena is cognitive and lies in overt behavioural dispositions. By implication, the evidence for intelligence technically lies in the test of appropriate behavioural disposition.

#### **THE EPISTEMOLOGICAL PERSPECTIVE ON INTELLIGENCE: THE BEHAVIOURAL FACTOR**

Rather than viewing the mind as a mental or physical entity, John Dewey employed it as an instrument for describing human behaviour. In his *The Quest for Certainty* (1929), Dewey avers that "there is no separate 'mind' gifted in and of itself with a faculty of thought; such a conception of thought ends in postulating a mystery of a power outside of nature and yet able to intervene within it" (277). What we call the mind is simply a description of how man reacts to his ever changing environment. In fact, mind and thought are functional aspects of the interaction of natural events. Mind is simply intelligent behaviour (Titus: 158).

Gilbert Ryle argues that the mind is the manner or the way in which a person behaves; hence there is no 'ghost in the machine' propelling human

action. As Titus explains, Ryle is simply anxious to get rid of what he calls the traditional “dogma of the ghost in the machine”, and to rectify the “category mistake” or “philosopher’s myth”. This mistake and myth are found when men put the facts of mental life in a category or class to which these facts do not properly belong. Ryle uses an example of a foreign visitor on a university campus. The visitor, after being shown the college halls, library, dormitories, playing fields, administration offices, and the activities associated with them, asks to see the university. The university, he is told, is just the buildings and activities he has seen. To talk about the university as some counterpart to what he has seen is a mistake. In the same way, to talk about “mind” or “consciousness” as some counterpart to human behaviour or as some world behind or beyond the activities is a mistake. The meaningful referent of the concept “mind” is explained by describing how persons behave (158-159).

As already indicated in our discussion of theories of intelligence, some philosophers and psychologists believe that in matters of intelligence, the issue of mind or consciousness should not arise; instead, emphasis should be placed on intelligence tests. To the question “How do we know that a person is intelligent?” William Lawhead responds with a rhetorical question: “Don’t we know by the way the person behaves and responds to situations and, in particular, by how well he or she does in intelligence tests? (Lawhead, 230). William Lycan’s response is that “Surely we tell, and decisively, on the basis of our standard behavioural tests for mental states ... we know that human being has such-and-such mental states when it behaves, to speak very generally, in the ways we take to be appropriate to organisms that are in those states.” (Lycan, 1987: 125).

Lycan draws our attention to the fact that the proof of the mental states lies in epistemological investigation rather than metaphysical one. Edgar Brighman (1951) throws more light on this point with the argument that if we do not study mental states with the appropriate method we may not actually arrive at the truth about consciousness. A metaphysical or ontological study of mental acts can best be achieved through the act of introspection, that is, the act of turning attention to one’s own consciousness. Brighman quickly points out the methodological problem of this approach and the wisdom in employing the method of observation. According to him:

The method of introspection suffers from the defect of giving information about the consciousness of one person only, namely, the introspector himself. It would seem that data derived from such a restricted

field are too fragile a basis on which to rear a psychology and philosophy of consciousness. Hence, psychology has always had recourse to the method of the objective observation of behaviour. We observe that our own consciousness is followed or preceded by certain kinds of behaviour, and we believe that similar behaviour on the part of others is accompanied by similar consciousness. If, then, we are to know anything about the consciousness of others, we must observe their behaviour - watch their reactions to stimuli, listen to their words, note their gestures and facial expressions (Brighman, 1995:186).

The method of using behaviour as index of mental state is popularly referred to as behaviourism. P. Churchland who sometimes refers to it as "philosophical behaviourism" summarises it as the claim that talk about emotions and sensations and beliefs and desires is not talk about ghostly inner episodes, but is rather a shorthand way of talking about actual and potential patterns of 'behaviour' (Churchland, 1984:23). Similarly, intelligence as a subset of mental state is a pattern of behaviour. But what is behaviour and what is intelligent behaviour?

By behaviour, we mean those activities of an organism that can be observed by another person or by an experimenter's instruments (Hilgard, 1962: 6). These activities are of diverse forms. They could be in form of the organism's speech acts or body movements like moaning, laughing, crying, facial reactions, muscular vibration, and etcetera. They could also be in form of sudden perceived changes in skin tone (like turning pale), body temperature, blood pressure, and sweat secretion. The importance of behavioural dispositions is that they are plausible means of inferring the unobservable mental events. In the words of G. Graham: "Pain is moaning. Happiness is smiling. If we could subtract behaviour from mind we would have nothing left over" (Graham, 1993: 39-40). Indeed, the importance of the role of behaviour in the study of mental states cannot be overemphasised in the field of psychology. As early as 1913 when modern psychology was barely few years old, an American psychologist named John Watson attacked the definition of psychology as "the study of the mind". The content of another person's mind, he noted, cannot be directly observed. Science, Watson asserted, studies public, out-in-the-open objects and

events that anyone can observe and record. A true science cannot be based on what might be a figment of an introspector's imagination. Therefore, said Watson, to be truly scientific we should focus on behaviour, which we can observe instead of thoughts and thought process, which we can only guess at (Watson, in Geiwitz, 1980:6).

From the foregoing, intelligent behaviour is viewed as the behavioural instantiation of whatever we define or theorise as intelligence. For instance, intelligent behaviour, for Thurstone, shall be equated with the exhibition of those activities associated with his identified seven primary mental abilities. While Sternberg will see it as the instantiation of analytical, creative and practical abilities, Gardner will equate it with the observation of activities exemplifying his "eight multiple abilities". This means that there is a causal relation between intelligence and behaviour. The latter is presumed to be informed by the former. Psychologists anchor this position on what they call Stimulus-response theory (S-R theory). This is the assertion that all behaviour is in response to stimuli (Hilgard, 17). It is in an attempt to confirm or disconfirm this causal relation that psychologists introduced intelligence tests.

## CONCLUSION

Behaviourism encourages intelligence tests as means of measuring human intelligence. Such tests are usually administered by a qualified psychologist, according to professional and ethical principles. Interpretation is based on a comparison of the individual's responses with those previously obtained to establish appropriate standards for the test scores (Schnitzer, 2008: para. 1). At this point we can argue that between the ontological and epistemological approaches for proving intelligence, the latter approach is more plausible and less controversial. Its strength lies in its simplicity. We need not dissect an individual's brain or try vainly to search for his mind to determine if he were intelligent. His behavioural disposition, sometimes prompted by appropriate cleverly devised tests, is a plausible means. The role of consciousness, mind or brain is not necessarily undermined here. The argument is that the various controversies ascribed to these concepts weigh heavily against their role in proving intelligence.

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