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AUTISM: AN EVALUATION IN TERMS OF THEORY OF MIND AND AUTISTIC SAVANTS

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Abstract:-The paper is about evaluating theory of mind for explaining autism and a challenge posed to its validity by reality of autistic savants. Paper explains symptoms of autism in terms of triad behaviours of lack of communication, social abilities and imagination followed by explanations proposed by theory of mind in terms operational term called mentalistic deficit. Two theories of theory of mind namely 'theory-theory' and 'simulation theory' are discussed for explanation of hypotheses of theory of mind. Second half of the paper deals with phenomenon of autistic savants, savant skills with evidences in the form of documented studies. A brief review of theories of examining savant skills is presented here. All these skills oppose the explanations provided by theory of mind. Finally it has been agreed that both theory of mind and autistic savant are realities and are complementary to each other rather than opposing each other. If a child is found autistic we need to ascertain whether child is a savant or simply autistic one. In concluding remarks author suggests savants skills should be used as advantage in favor of the autistic child and label instead be changed to 'wonder child'.

Keywords:Theory Of Mind, Autistic Savant, Idiot Savant, Savant Syndrome, Mentalising

1.INTRODUCTION

Autism is one of the most complex forms of disability related to software aspect of brain and essentially developmental in nature. It involves more than one branches of study including Genetics, Neuroscience, Neuropsychology, Psychology, Sociology, Communication, Language etc. Due to multidimensional aspects of the problem study has become more complex and interdisciplinary nature which makes it difficult to handle. The coverage area of the study kept on increasing and new dimensions emerged which could not be covered under one term, so an umbrella term was proposed named Autism Spectrum Disorders (ASD's). Autism spectrum disorder involves at least three conditions namely Autism, Asperger syndrome and Pervasive developmental disorder not otherwise specified (PD-NOS). Specifically Autism is defined as a neurodevelopmental disorder characterized by impaired social interaction, verbal and non-verbal communication, and restricted & repetitive behavior. The diagnostic criteria require that symptoms become apparent before a child is three years old. Autism affects information processing in the brain by altering how nerve cells and their synapses connect and organize; how this occurs is not well understood. Asperger syndrome, is about delays in cognitive development and language, and pervasive developmental disorder, not otherwise specified (commonly abbreviated as PDD-NOS), which is diagnosed when the full set of criteria for autism or Asperger syndrome are not met.

Theoretical explanation for autism and theory of mind

Happe and Ronald (2006, 2008) concluded autism is consequence of common cause at the genetic, cognitive, and neural levels commonly called triad of symptoms. Further remarked there is increasing suspicion that autism is instead a complex disorder whose core aspects have distinct causes that often co-occur. As far as genetics is concerned it is complex and less understood and could be result of any of the genetic mutation mode (deletion, duplication or inversion) or a combination of these. At neural level it points to synaptic dysfunction as a cause of autism. Some rare mutations may lead to autism by disrupting some synaptic pathways, such as those involved with cell adhesion. On cognitive front it is attributed mentalistic deficit expressed in behaviors triad including lack of

social skills, communication ability and imagination. According to Baron-Cohen et al., (1985) this symptoms triad can be explained by a single cognitive deficit, termed as 'theory of mind' term introduced by Premack and Woodruff (1978). Leslie (1987) explains there is a dedicated cognitive mechanism that allows human beings to represent thoughts, feelings and beliefs about the world, which is absent in individuals with autism. Frith et al (1994) termed this ability as 'mentalising' which implies people constantly attribute mental states to each other and predict their behaviour on the basis of inferred beliefs rather than on the basis of physical facts. At the behavioral level, there are a number of consequences of the lack of mentalising. Well documented disabilities are to acquire an intuitive everyday 'theory of mind', the inability to understand intended meaning, and the inability to understand pretend play.

Theory of mind with little variation overlaps concept of empathy, which an autistic individual lacks. Theory of mind has been explained mainly by two theories namely 'theory-theory' and 'Simulation Theory' popularly known as 'cold theory' and 'hot theory' respectively. Cold theory is named so due to its hypothesis of passive learning of empathy skills by the child, in the form of gestures and expressions -- and uses his everyday understanding of people as evidences to develop theories that explain and predict the mental state of people they come in contact with usually appreciated as 'folk psychology'. Whereas hot theory assumes active involvement of child as simulation necessitates for understanding other's perspective. Simulation theory states that we are natural mind readers. We place ourselves in another person's "mental shoes," and use our own mind as a model for theirs. Gallese (1998) contends that when we interact with someone, we do more than just observe the other person's behavior. He believes we create internal representations of their actions, sensations and emotions within ourselves, as if we are the ones that are moving, sensing and feeling. It is actively and intentionally done as in case of actors do in a movie and more so in a stage drama. The intense emotions can only be produced by an actor if s/he is able to create second order representations of the prescribed character whose role s/he is performing. Simulation theory believes humans are "mind readers" by nature, building interpretations of the mental events of others and feeling our constructions as starkly not very different from physical objects we feel by virtue of our senses. Psychologists name this ability as a trait called as empathy skills. Humans evolved this ability as a consequence of millions of year's efforts to develop interacting social community for mutual benefit and survival. Precisely because such an interpretive system does model the world in terms of unobservable entities (thoughts, intentions, beliefs, and desires), it needs to be coupled to confederate modules that can construct a bridge from the observable to the unobservable. Unobservable entities are invisible to association-learning mechanisms, but they are "visible," in terms of our expressions, gestures and language. By linking observable cues (such as direction of gaze) to representations of unobservable mental states (such as wants and beliefs), they create what one can think of as the "psychophysics" of the social world.

Theory of mind could explain some observations about autism including lack of social ineptness or withdrawal, lack of communication etc. but there are serious questions about validity of the theory as perfect explanation. It fails to explain restricted or repetitive behavior patterns among autistic children, desire for sameness (one of two cardinal features for Kanner & Eisenberg, 1956), islets of ability (an essential criterion in Kanner, 1943), excellent rote memory (emphasized by Kanner, 1943) and finally can not deny reality of idiot savant and savant skills (striking in 1 in 10 autistic children, (Rimland & Hill, 1984). Idiot savant better termed as autistic savant is the real threat to the validity of theory of mind, so deserve adequate detail in the paper.

Savants

The term 'idiot savant' dates back to the concept of the "village idiot," a person who might be tolerated because he or she exhibited certain uncommon skills. In other cases, the exhibition of savant skills, particularly in the middle ages, was apt to be considered witchcraft. Unfortunately, a savant cannot necessarily control demonstration of such skills, and some "village idiots" were chased out of their villages or killed. Savant syndrome was first properly recognized by Dr. J. Langdon Down (1828-1896) also credited for originating the term Down's syndrome, in 1887, he coined the term "idiot savant", meaning low intelligence, and from the French, *savoir*, 'knowing' or 'wise', to describe someone who had extraordinary memory but with a great defect in reasoning power. Savants are people who despite serious mental or physical disability have quite remarkable, and sometimes spectacular, talents. The term "idiot savant" is outdated and inappropriate. Virtually all savants have a high degree of intelligence and are not idiots by any standards. Rimland (1978) an authority on autism research introduced a more appropriate term 'autistic savant,' which is the current label accepted by the research and special education community although a bit misleading in nature. Savants is an exceedingly rare phenomena, although there are several well documented cases (Sacks, 1986; 1995; Treffert, 1989), and recently the Academy Award winning movie Rain Man has led to the term savant being much more widely known. Although there is a strong association with autism, it is certainly not the case that all savants are autistic. It is estimated that about 50% of the cases of savant syndrome are from the autistic population, and the other 50% from the population of developmental disabilities and CNS injuries. The estimated incidence of savant abilities in the autistic population is about 10%, whereas the incidence in the learning disability population is probably less than 1% even though is larger in number. There is gender bias in occurrence as males are six times as many as female autistic savants. The savant skills are often called splinter skills, Alan Snyder, current skeptic of savantry says: "The skills can emerge without training, and they're not qualitatively improved by practice.

In fact, savants generally don't have insight into how they perform their skill" (Kaufman 2010). These skills are so special and well documented that these need to be highlighted; some better documented are presented below.

Memorization - superior memory is a common feature of savant syndrome, but it also can be a special skill in its own right. There are cases of savants who have memorized population statistics, telephone books, bus schedules, and in one remarkable case the 9 volume edition of Grove's Dictionary of Music and Musicians (The Walking Grove, Sacks, 1986). Kim Peek, for example, on whom the film Rain Man was based, has a "photographic" memory.

Lightening calculation - this is exhibited in the instantaneous calculation of multiplications, square roots, etc., the determination of prime numbers, or subtilizing (The Twins, Sacks, 1986).

Calendar calculating - often involving the ability to identify the day of the week upon which a particular date falls, in one case any time in the last, or next, forty thousand years!! (The Twins, Sacks, 1986).

Musical ability - this is a relatively common savant skill, the co-occurrence of musical genius, blindness and learning disability is a striking feature here. Savants will have perfect pitch, and can play a complete piece of music after hearing it only once (Hermelin, 2001).

Artistic ability - not as common as musical abilities, but there are savants with exceptional painting, sculpture and especially drawing skills. e.g. Nadia (Selfe, 1977) and Stephen Wiltshire (1987; 1991), Sacks (1986). Sacks, 1995; Hermelin, (2001).

Language ability - this is fairly rare, but there is one well documented case of a savant with CNS damage since birth who could read write and translate 15 to 20 languages (Smith & Tsimpli, 1995; Hermelin, 2001). Hermelin also includes a case of a savant poet.

Theories of Savant Syndrome

The reason why some autistic and disabled individuals have savant abilities is not understood well, however, the strong link with autism does offer a good starting point. There have been many theories, but it is clear that no one theory is sufficient. Theories include: Biological-Developmental - such as genetic, neurochemical, left hemisphere dysfunction, frontal and temporal lobe damage, and the DSM IV diagnostic category is Pervasive Developmental Disorder (PDD); Cognitive- such as deficits in executive function and abstract thinking; weak coherence theory; highly developed procedural memory and eidetic imagery (Happé, 1994; Schopler & Mesibov, 1995), compensation for sensory disabilities (especially blindness) and social isolation, and the modularity of mind hypothesis which proposes that particularly when executive cognitive functions are disrupted the mind exhibits a striking modular organization (Smith & Tsimpli, 1995). However, any theory would need to explain the link with autism, the islands of exceptional ability, the bias towards male savants, and recent research that includes a finding of the emergence of savant abilities in front-temporal dementia patients, and the suggestion of a neurotoxic effect of circulating testosterone on the left hemisphere in the male fetus possibly related to autism.

Significance of savant skills

Savant skills are rare in occurrence in human beings so should be used as advantage for dignified existence of an autistic child. Although there is no cue even to the autistic individual how it come in to play, but there is possibility of using these skills for advancement of art as well as science of cognition. Parents can use these skills for enhancing vocational and professional prospects of the autistic child. Autistic artists can produce amazing creations to be cultural assets of a society. Autistic children need support for their expression which needs to be provided by parents, teachers and society. Above all existence of autistic savants demonstrate why disable should be called as special children.

Concluding remarks:

Both theory of mind and savants are realities and are well documented, moreover explain many of our observations about autism. These two realities are not opposite to each other rather are complementary to each other. When a child is surely autistic on the basis of triad of behaviour s/he could be further be categorized as autistic savant or simply autistic. Although there is no known cure for autism, but there can definitely be rehabilitation and management plan for the child. Depending on simply autistic or autistic savant rehabilitation plan should be designed. Rehabilitation plan for simply autistic child should focus on socialization skills whereas autistic savant should additionally be motivated and reinforced to exploit special abilities as we do in case of a normal talented child. Consequently, why should we not name autistic savant child as a 'wonder child' who is positively special with some limitations like any other child.

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