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EXCEPTIONAL ABILITIES AND INDIVIDUALS WITH AUTISM. A HISTORICAL ACCOUNT

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ABSTRACT

This paper examines the historical account of individuals with autism and their exceptional abilities (savant skills). It has been mentioned in some research journals regarding the exceptional abilities of individuals with autism spectrum disorder (ASD). These occurrences transpire when individuals with intellectual disabilities, including ASD), may exhibit certain capacities of talent or genius that may differ from the adaptive living skills. One in ten persons with ASD has savant abilities in varying degrees. Academics and scholars used to believe that exceptional abilities or savant skills were irrelevant or insignificant. Nevertheless, savant syndrome has gained more interest in recent years. It is an area for further exploration in terms of research. Academics and scholars are currently trying to comprehend and appreciate the intricacies of the human mind. The savant syndrome is about describing individuals with intellectual difficulties (including ASD) who may also experience and possess astonishing aptitudes in arithmetic, reading, calendar calculations, music or art

KEYWORDS: ***exceptional abilities, autism, savant syndrome***

SAVANT SYNDROME

Savant Syndrome is a rare condition in which the individual with different developmental challenges, including ASD, may display areas of brilliance or ability that are in contrast to that individual's general functioning (Finocchiaro, 2015; Pring et al., 2012; Rohan, 2010; Traffert, 2014; Treffert & Wilson, 2016). In addition to ASD, savant syndrome can occur amongst individuals with other developmental disorders, for example, Tourette's syndrome (Darius, 2010; Strauss, 2014). The first account of savant syndrome appeared in a scientific journal in 1783, about an individual called Jeremiah Buxton who was very good at mathematical calculation (Treffert, 2009). Survey studies carried out by Rimland (1978) and Hill (1977) revealed a higher incidence of savant syndrome in populations with ASD than in populations with intellectual impairment.

HISTORICAL ACCOUNTS OF SAVANTS

One of the most famous individuals with ASD is the fictional character by the name of Raymond Babbitt. This character was portrayed by Dustin Hoffman (a Hollywood actor) in the 1988 movie, called the Rain Man. The original inspiration for the movie Rain Man was a real-life savant called Kim Peek. Kim Peek passed away on December 19, 2009 at the age of 58. By the time of his death, Kim had memorized over 6000 books and had an encyclopaedic and in-depth knowledge of geography, music, literature, history, sports and nine other areas of expertise (Hughes, 2012; Peek & Hanson, 2008; Treffert, 2009; Treffert, 2014; Treffert & Wilson, 2016).

The amalgamation of visual impairment, intellectual challenges and being a musical prodigy is over-represented throughout many reports with regard to the savant syndrome (Denis, 2014; Treffert, 2014). Some of the reports dated as far back as the 19th century. A prominent person was Thomas Wiggins Bethune (1849-1908), also known as 'Blind Tom'. Tom was blind and was born a slave. He travelled together with his Master to different parts of the world to perform (Allen, 2015). Other famous musical savants who are visually impaired include Derek Paravicini, Leslie Lemke, Rex Lewis-Clack and Ellen Boudreaux. Derek, Leslie and Rex were also diagnosed with ASD. This triad of musical genius, visual impairment and intellectual difficulties occurs regularly in savant syndrome (Denis, 2015; Poulin-Charronnat, 2014; Treffert, 2014).

There are few reports of female savants. Some of the more prominent female savants include Henrietta Seth, Ellen Boudreaux, Flo and Kay Lyman (Jeon, 2016). The case of Nadia has generated significant debate about the possible 'trade-off' of special abilities and talents for the acquisition and attainment of language and social skills (Treffert, 2012; Treffert, 2014). Treffert (2014) reported that Nadia was a nonverbal child with ASD who displayed noteworthy artistic prowess in her drawings. However, as she was taught to increase her area of spoken language and social skills, her talent for drawing slowly diminished.

Treffert (2012, 2014) also describes a blind musical savant with ASD called Ellen Boudreaux. In addition to

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possessing savant-like qualities in her musical prowess, Ellen displays precise spatial location abilities. Despite her visual impairment, Ellen is able to manoeuvre around rooms without running into objects. While walking, Ellen makes little chirping sounds. This is similar to active sonar, a technique that uses the emission of sounds and listening for echoes. Ellen also has an extremely accurate internal clock. When she was a young girl about eight years old, her mother helped her to overcome her fear of the telephone by persuading her to listen to the automatic time recording (the 'time lady') on the telephone. From that experience, Ellen is now able to tell the exact hour and minute at any time of the day without seeing a clock (Treffert, 2012).

One of the first explanations of savant syndrome was provided in a scientific research paper that appeared in the German psychology journal called Gnothi Sauton in 1783 (Deerrose, 2011). This report described the case of Jedediah Buxton who was a human calculator with a superior memory (Deerrose, 2011; DePriest, 2015). Rush (1789), the father of American psychiatry, also provided and delivered one of the earliest accounts of the savant syndrome when he described the speed of mental calculation by a savant named Thomas Fuller. He described Thomas Fuller as someone who had poor comprehension of language and yet could perform complex calculations. Thomas Fuller was once asked the question of how many seconds a man had lived given his age of 70 years, 17 days and 12 hours. Within 90 seconds, Thomas Fuller was able to give the precise answer of 2,210,500,800. He even factored in the 17 leap years that were included during that period (Erickson, Early, Wink, & Erickson, 2013).

One of the first detailed descriptions of savant syndrome was given in London in 1887. At the invitation of the Medical Society of London, Dr J. Langdon Down gave that year's prestigious Lettsomian Lecture. In that address, he revealed that during his 30 years as a medical doctor at the Earlswood Hospital, he had come across a group of patients that he described as interesting and fascinating as they possessed skills that were above their cognitive levels (Puente, Heller, & Sekely, 2016). He said that there was an interesting group of cases for which the term 'idiot savants' had been given and that he had observed their gifts and talents. He then presented ten cases of these individuals that showed many similar and comparable features to cases of savant syndrome. Dr. Down recounted that one of his patients had committed to memory The rise and fall of the Roman Empire verbatim and could recite it backward or forward. He also noted that there were children who drew with extraordinary skills but possessed a childlike mind. He also commented on other children in his case notes who exhibited musical talents, displayed arithmetical genius or presented precise timekeeping skills. The skills and abilities highlighted by Dr. Down are today classified as savant syndrome. Individuals in this category exhibit a combination of special abilities and prodigious type memory.

In the 19th century, the word 'idiot' was a generally accepted term to depict an individual with an intellectual disability or having an intelligence quotient (IQ) of below 25. IQ is defined as the ability to comprehend elaborate ideas, adapt to the surroundings, overcome challenges, and learn from experience (Yu et al, 2016). The word 'savant', meaning a knowledgeable person, was derived from the French word savoir. Dr. Down amalgamated these two words and created the term 'idiot savant' by which the condition was generally known over the next century. While descriptive, the term was misleading since almost all cases occur in individuals who possess an IQ higher than 40 (Bennett & Heaton, 2017; Treffert, 2014). In the interest of precision and to promote self-worth, the term 'idiot savant' has now been replaced by the term 'savant syndrome', which is extensively used in most research journal papers. Savant syndrome is preferred over the term 'autistic savant' because approximately 50% of individuals with savant syndrome have ASD and the other 50% of the reported savants usually have an injury or impairment to the central nervous system (CNS) due to damage or disease (Bennett & Heaton, 2017; Strauss, 2014; Treffert, 2014).

Dr. Tredgold (1914), who was a medical doctor at Earlswood Hospital, penned a very comprehensive and wide-ranging explanation of savant syndrome in his textbook called Mental Deficiency. In this popular textbook, Dr. Tredgold described over 20 cases from various clinicians (Strauss, 2014). In 1978, Hill provided a review of the research literature published between 1890 and 1978. This paper also included 60 reports, which involved over 100 individuals with savant skills (Treffert & Rebedew, 2015).

In 1978, the researcher Rimland provided a summary of the data he had gathered on savant skills and special abilities. He had a sample population of 5400 children, out of which 531 were labelled as having ASD. In 1988, Dr Darold Treffert (1988), a researcher who has been studying savants for over 30 years, provided an updated review and evaluation, which contained more details on all the earlier reported cases. He advised and recommended that the name of the condition be altered to savant syndrome.

In 1989, Treffert first published the book, Extraordinary People. In this book, he summarized cases that spanned a century, displaying clarifications, observations and research findings and verdicts since Down's 1887 account of this syndrome. In her book, Bright Splinters of the Mind, the author Hermelin (2001) summarized the outcomes and verdicts developed from 20 years of research performed by her co-workers and herself.

INCIDENCE OF INDIVIDUALS WITH ASD WHO HAVE SAVANT SKILLS

Rimland (1978) looked at the incidence of savant skills in 5,400 children with ASD whose parents had indicated that their child had a special skill or talent. Rimland collated his data from a questionnaire that the parents had completed. According to Rimland, 531 children with ASD or approximately 10% were reported to have special skills or talents. Other researchers have reported that at least ten percent of the ASD population showed some form of savant skills (Bennett & Heaton, 2017; Bouvet et al., 2014; Meilleur

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et al., 2015; Rieznik & Sigman, 2017). Savant skills occur more frequently in males than in females, with an approximate ratio of six to one (Baron-Cohen et al., 2013; Simard-Meilleur, Jelenic, & Mottron, 2014; Treffert, 2014). It was also reported by some researchers in the field of ASD that there is a high incidence of individuals with ASD among the general population of savants. Other researchers have noted that one in 2000 people with intellectual and developmental disabilities has savant skills (Meilleur et al., 2015; Simard-Meilleur et al., 2014; Treffert, 2014; Ward, 2017). Savant skills in the areas of mathematics, art, memory and music have also been noted to be ten times more common in individuals with ASD than in other groups with learning challenges (Bennett & Heaton, 2017; Meilleur et al., 2015; Treffert & Rebedew, 2015).

The definition of a savant can be ambiguous due to the lack of epidemiological investigations, inconsistencies in definitions, a wide variation in diagnostic procedures, and the different age and ability levels of the cases reported over the years. The incidence of savant skills among individuals with ASD is rare (Bennett & Heaton, 2017; Meilleur et al., 2015; Treffert & Rebedew, 2015), and there is little valid information on the incidence rates.

The frequency of savant skills reported amongst individuals with ASD varies between reports (Bennett & Heaton, 2017; Hughes et al., 2017; Shuqin, 2013). There have been a few surveys on this phenomenon. Hill conducted a survey in 1977, and Rimland carried out another one in 1978.

In Hill's study, it was reported that there was an approximate 0.06% occurrence of savants who were intellectually impaired. This incident rate was based on the replies to a survey of 300 public residential facilities for individuals with special needs. This rate of 0.06% is based on the reporting of 54 savants within a population of 90,000 residents. By comparison, in Rimland's study, the findings suggested a 10% occurrence of savant skills amongst the population of individuals with ASD. This suggests that the prevalence of savant skills amongst individuals with ASD is higher than in the population of the intellectually impaired.

There were differences between the two studies that need further critical examination. In Hill's study, caregivers were surveyed, whilst in Rimland's study, parents were surveyed. It was noted by Heaton and Wallace (2004) that parents might sometimes give a more biased positive opinion when reporting their children's skills. It was also noted that in Hill's study, the terminology of savant was not clearly defined, and therefore many of the supervisors in the different institutions had their own operational definitions and interpretations of what a savant should be (Heaton & Wallace, 2004).

Another challenge in accurately determining the co-existence of ASD and savant syndrome is the changes in diagnostic criteria and practice over the past 25 years. Therefore, there is a possibility that many savants with intellectual disabilities were diagnosed before the advent of the ASD diagnostic label (Heaton & Wallace, 2004).

CONCLUSION

Individuals with ASD who display savant skills are a paradox. How can individuals with ASD, who appear to be intellectually challenged in their general independence skills, display savant skills that are far more developed than those of individuals with higher intelligence? What is it about ASD that predisposes individuals with ASD to savant skills? (Bennett & Heaton, 2017; Hiniker, Rosenberg-Lee, & Menon, 2016; Meilleur et al., 2015).

Due to improved diagnostic tools and the expanded definition of ASD, the number of individuals diagnosed with ASD has increased over the past years (Hansen, Schendel, & Parner, 2015; Kroncke, Willard, & Huckabee, 2016; Rudra et al., 2014). Researchers (Bennett & Heaton, 2017; Finocchiaro, 2015; Hughes, 2012; Meilleur et al., 2015; Quirici, 2015; & Treffert, 2014) have implied that there is a higher incidence of savant skills among individuals with ASD. There is no single theoretical framework that offers any logical explanation concerning individuals with ASD who display savant skills. A framework that attempts to explain this phenomenon is the weak central coherence theory, which suggests that a specific perceptual-cognitive style, loosely described as a limited ability to understand context, underlies the central disturbance in ASD (Happe, 2013; Riches, Loucas, Baird, Charman, & Simonoff, 2016; Vanegas & Davidson, 2015). One explanation offered by the weak central coherence theory is that for many individuals with ASD who exhibit savant skills, the manner in which they achieved their savant skill could be from preliminary and initial attention to certain details and segments. This initial attention would lead to the subsequent construction and assembly of integrated pictures, music, calendar structure and the attainment of foreign languages (Happe, 2013; Skorich et al., 2016; Vanegas & Davidson, 2015).

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