

## Prodigious Polyglot Savants: The Enigmatic Adjoining of Language Acquisition and Emaciated Potentials

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### Abstract

*Affluent research has profoundly dealt with the aggregate umbrella term of developmental disorders. It has equally identified a host of disparate types that in one way or another daunt afflicted individuals' every day living. The heterogeneous nature of these pervasive and distinct kinds has resulted in academic pros and cons as regards labels, diagnosis, prevalence, taxonomies, causes, theories, profiles, treatments and the underlying brain mechanisms. Consequently, conflicting views, conceptual diversity and overlapping boundaries have led to a lack of a delineated clear-cut distinction pertinent to savant syndrome, autistic spectrum disorder (ASD), high functioning autism (HFA), Asperger syndrome (AS), synesthesia, and many other related disorders. Savant syndrome occurrence and prevalence has been observed in some autistic individuals, (Treffert 2007; Dowker et al. 1996), epilepsy, cerebral palsy, dementia, schizophrenia, visual impairments (Bölte & Poustka 2004); Asperger syndrome (Fitzgerald & Corvin 2001) and synesthesia (Bor et al 2007; Tamm et al 2006, 2009). Conversely, this blurry situation has largely to do with the existence of a huge number of individuals displaying simultaneously more than one disorder like being an autistic and savant, or being a synesthete and savant. (Treffert. 2000; Hiles 2002; Snyder & Mitchel 2009, Smith & Tsimpli 1995, Snyder 2009 to cite just some). This in turn has been reflected on the deterred, aberrant advancement of individuals. Savant syndrome is a fascinating rare condition that deals with imbecile individuals with mental and/or physical impairments who concurrently show phenomenal, awe-inspiring knowledge in a rather partial, yet deep scope of repertoire hence showing incongruence of these talents with the overall limited capabilities. This common sense-defying knowledge pertains primarily to their eidetic and massive feats and flukes of memory that entitles some to achieve a genius-like status. Savant condition is bound to either congenital anomalies in the left brain hemisphere or to exposure to brain damage or diseases in the same area sometime later in life which could result in acquired savantism. Treffert (1989, 2000, 2005, 2009). Savantism has a spectrum of prodigy allocating each and every realm its attributes: prodigious, splinter and talented savants. (Treffert 1989). Additionally, some savants display a triad of blindness, arts and brilliance. Their domains of expertise is inclusive of music, calendrical and calculating abilities, arts, mechanical and spatial skills, and geographical orientations. However, a hardly present trait by the vast majority of savants is polyglottism by means of which the mastery of multiple foreign languages is demonstrated though with a low IQ and without formal instruction. (Smith & Tsimpli, 1995, Tsimpli, & Smith 1996; Nettlebeck & Young 1999; Bates, 1997; Heaton & Wallace 2004, Treffert 1989, 2000, 2010). Hence, fervent researchers, canny entrepreneurs and visionary scientists have hailed resorting to many advanced brain imaging tools as PET<sup>d</sup> and TMS scans, to identify areas of the brain, particularly, the left brain hemisphere where the claimed damage could have taken place impacting the overall brain function and consequently, behavioral patterns of affected persons (Snyder 2001, 2006, 2009). This theoretical- descriptive study aims at exploring savants' specific areas of brilliance in language, their impact on their surroundings, and the obstacles facing them. Another goal is to elucidate their asymmetric polished as well as darkened profiles as portrayed in the literature. A final objective is to glean what panaceas have been offered to provide bona fide aids to this category of people. Unequivocal results demonstrate that savants have contributed positively to their peerages and societies at large, some of which have even influenced populations in the millions as public educational tools as is the case of Kim peek, a severely mentally retarded savant; and Tamm et al, a prodigious, high functioning autistic savant, and a digit synesthete. However, the contributions of Christopher, the polyglot savant, are evident in the mastery of many languages serving mainly research rather than his peers and society. Ultimately, their pockets of brilliance vis-à-vis general impairments are no barriers to success and social accreditations and enrichments. Further conclusions provide some insights into future research.*

**Keywords:** prodigy, retardation, scant polyglots, left brain damage, photographic memory, manual dexterity/clumsiness, imbecility, IQ, lucid incongruence.

## **Introduction**

“You don’t need to be disabled to be different, because everybody is different.” Indeed, the words of Kim Peek, the world’s most well-known mega savant, reveal much about the uniqueness of disabled savants in certain fields of expertise. Savant syndrome and a plethora of other related disorders have been variously investigated, hence arriving at no all-encompassing status. To clarify, the earliest case of savantism dates back to 1783 in which a German psychology journal referred to the case of Jedediah Buxton, an illiterate legendary calculator with iconic memory. ([www.encyclopedia.org](http://www.encyclopedia.org)). However, according to Bölte & Poustka (2004 p. 121), research on this issue is rather sparse bound to the low percentage of occurrence, inaccurate and heterogeneous exposé of the syndrome, versatile scientific diagnostic tools, sporadic studies, and the confines of the condition itself. Likewise, Howlin et al. (2009 p. 1360; Barnes & Stephen M. 1995 p. 125) mention that research has provided meager studies on autistic savant individuals. In the light of this, there is a lack of unifying definitions, diagnostic tools, age categories, and spectrum of prodigy all of which might be regarded as a disadvantage to savant syndrome. To be or not to be a genius has warranted investigations amongst scholars. Tao (1999 p. 32) draws the attention to the generously-used term ‘genius’ hence calling for caution in using this term.

He believes that it is the highest level in which spectacular endeavors are accomplished as having substantial calibers, wisdom, creativity, experience and an array of other comparable highly regarded human values that pass the test of time compared to prodigious, young and less-experienced savants. To date, history has produced a handful of ex-prodigies as Mozart and Einstein. In the same way, Miller’s view of a savant includes superior performance in one area of expertise and a discrepancy between this superiority and the overall level of amiss functioning. (1998 p. 74). Moreover, what realms belong to a certain disorder has similarly caused lack of general consensus. In addition, a unifying view of prodigy has equally been missing. Welling (1994 p. 199) maintains that investigators have not explained justifiably the concurrence of prodigious abilities and low general intelligence in spite of studying diverse kinds of savants over the years. Furthermore, in some instances, even trained professionals’ performance fails to match with that of savants (ibid). Originally, studies were purely descriptive until a shift of focus has been geared towards brain studies. Besides, many savants demonstrate the same skill thus showing flamboyance in its interpretation. (Howe & Smith 1988; Treffert 1988; Hermlin & O’Conner 1986) (Cited in Welling 1994 p. 199).

Other researchers emphasize the fact that developmental disorders as autism and savant syndrome have received sort of concern due to their importance. (Selfé 1977; Hermlin & O’Conner 1970) (Cited in Jolliffe & Baron-Cohen 1997 p. 528). By the same token, Cohen et al. (2009 p. 1377) state that savantism is largely related to ASC (autistic specific condition), and to ASD (autistic spectrum disorder), the most frequent realms of savant syndrome and autism. Nonetheless and irrespective of observable disparity, one basic aggregate view is that savants possess pockets or clusters of excellence incongruent with their on the whole mental and physical impediments. How do these existent cognitive peaks function amid overall dysfunctionality by savants have given rise to academic pros and cons in attempts to explain this enigma. As regards the definition of ‘savant’, the Collins York English Dictionary (1999) defines it as:

A man of great learning; sage, from French ‘savior’ ‘to know’, from Latin ‘sapere’ ‘to be wise’.

The AAMD (The American Association on Mental Deficiency) definition of savants reads as:

Persons with obvious mental retardation who are capable of performing in sharply circumscribed areas (e.g. arithmetic, calendar calculating) at a remarkably high level. (Cited in Howlin et al. 2009 p. 1359)

As regards labels, savants have been pejoratively labeled as ‘idiots’, that is, ‘idiot savants’ with reference to their baffling excellence in a specific area and the mere absence of other equally outstanding qualities that normally coincide with such brilliance. (Down 1887 cited in Treffert 2009 p. 1352), or ‘mono savants’ though savant syndrome has recently taken the driver seat. (Charness et al. 1988 p. 278). However, there exist some observable differences among terms as autism, Asperger syndrome and savant syndrome. Broadly speaking, savants are distinguished from all other disorders in having super natural skills disproportional to other disabilities that are at times coupled with low intelligence. By comparison, these super talents supersede healthy, ordinary and intelligent people. In contrast, Asperger is at the far end of the autistic spectrum and affected individuals are ordinary people of normal or high intelligence but not necessarily geniuses exhibiting rather poor social skills and are preservative at doing mundane, mindless tasks. (Treffert 2000 no page) He besides maintains that savants are not universally present but are very common. Research has stated a low occurrence of about hundred cases in a century with male dominance reaching a 6 to 1 male - female ratio. (Treffert & Wallace 2002 p.86); Miller gives 3: 6 female to male percentage. (1998 p.75). For the sake of astuteness and clarity, Treffert has classified savants as: splinter skills: showing minor talent; obsessions with memorization of every day trivia as sports, license plates, numbers, historical facts, music, maps and routes

(Darius 2007 p. 8); talented skills include musical and artistic impressive talents (Darius & Valli 2007 p. 9) and thirdly, prodigious potentials that would even surpass ordinary people without any impairments. (Treffert 2009 p.1353). Bölte & Poustka (2004 p. 121), label splinter and talented as “essentially intra individual exceptionality or normal function whereas prodigious savants as “significant inter individual exceptionality.” Such prodigious, ablaze savants are the rarest of the rare constituting just around fifty savants who are alive worldwide today.

### **Review of Related Literature**

The earliest case of savantism dates back to 1783 in which a scientific German psychology journal referred to the case of Jedediah Buxton, (1707-1772), a legendary English eighteenth century math prowess who stunned the Royal Society of London during certain presentations. He stood out of the crowd due to the fact that he was illiterate, having received no formal instruction or rehearsal. Laboring as a farmer, he was talented at numbers computing highly complex math problems in his head. Research has stated recently that he had a sort of mental retardation although in original articles this is not the case. ([www.1911encyclopedia.org/jedediah Baxton](http://www.1911encyclopedia.org/jedediah_Baxton)). Two years later, namely in 1789, Rush reported the lightning abilities of Thomas Fuller who failed to comprehend anything apart from this domain. (Rush 1789 p. 62) However, these instances were mere descriptive accounts depending on the expertise of physicians and their experience. Later, Dr. Down observed special faculties by his patients labeling them as ‘idiot savants’ who exhibited astounding skills as memorization verbatim, drawing, music talent, arithmetical genius and time calculations. Britannica Concise Encyclopedia; Scripture 1891 (cited in Darius & Valli 2007 no page).

At that time, the term idiot was devoid of its negative recent connotations meaning a person with an IQ (intelligence quotient) below 25. Down came up with the word-coinage of idiot savant which was used as a medical term in the late 19<sup>th</sup> and early 20<sup>th</sup> century to refer to a person of an IQ less than 20. Treffert reckons that it is a misnomer since savants show an IQ higher than 40 hence replacing it with savant syndrome in place of the derogatory, largely discarded, archaic and invalid term idiot. (2009 p. 1352). Decades later, Tredgold (1914 cited in Treffert 2009 p 1352) vividly described over twenty cases on the condition gleaned from experienced clinicians. As has been mentioned at the very outset, cloudy borders amongst various disorders as autism, savantism, AS and a host of other disorders have made descriptions and treatments moot. Such disputability is traced back to the origin of disorders and its ramifications. In 1911, Bleuler, a Swiss psychiatrist, used the term ‘schizophrenias’ to refer to a group of children exhibiting peculiar social behavior distinct from the common acknowledged social behavior. Later, he coined the term ‘autismus’, English equivalent ‘autism’, which is now widely used.

He described the four primary symptoms essential for the diagnosis of this disorder; what he called the four as: **ambivalence**, loosening of **associations**, disturbance of **affect** and **autism**. Correspondingly, Kraepelin, (1919) referred to a group of patients identifying a split and anomalous personality as ‘dementia praecox’. He identified them in terms of lacking social rapport in the social arena, oddness, focus on the self and limited repertoire of interests and activities. (Cited in Fitzgerald & Corvin 2001 p. 314).

In 1921, Ernst Kretschmer, a German psychiatrist, wrote about certain mental disorders that were more dominant among people of specific physical types who resembled Asperger’s study. (Encyclopedia Britannica) Another pioneering work that got global recognition is the work of Kanner, (1943), an Austrian-American psychiatrist. Bound to the accessibility of his work in English, it helped spread his views particularly in the USA where it was published. Kanner described a group of 11 children who were characterized as being aloof, indifferent to other people and being repetitive in doing activities hence showing anguish for changes. Moreover, they exhibited food problems, and had belated echolalia (parroting) though descending from good families. As grown-ups, they lacked proper communication and social relational skills. He referred to this condition as ‘infantile autism’, denoting a mind in a protracted state of infancy (p.219; Barr 1898 p 22).

An almost contemporary relevant study was published in Germany, by the Austrian physician Hans Asperger whom the Asperger’s Syndrome (AS) was named after (1944). His work, though pivotal, remained virtually unknown and enjoyed less familiarity outside the German literature being written in German and hence, barely translated and introduced to the English – speaking readership until 1981 when Wing’s clinical account of AS used this label in honor of his name. However, Asperger demonstrated the discomfited social behavior of four boys whom he labeled ‘autistischen psychopathen’ which means ‘autistic personality disorder’. He observed a certain peculiar behavioral pattern which included diminished empathy for others, poor inclination to form friendships, solitary habits, social ineptitude, and one-sided conversations. Children also exhibited distinct profile in talking about their favorite topic in painstaking details which prompted him to call these children ‘little professors’ (cited in Wing, 1981 p. 115).

In a meticulous study on the issue of savantism, Treffert (1988) a pioneer in the field for over forty years has contributed immensely to the elucidation of this condition. In this article, he reviews what has been accomplished in terms of definitions, new findings and summaries all of which convey a comprehensive account to the mechanisms of the human brain. In a subsequent study, Treffert (1989), in his book *Extra Ordinary People* has collected reported cases since 1887 and has documented on the baffling abilities of savants, their stereotypical way of living, determination and the usually positive environment they had been endowed with. In doing so, Treffert tries to open a window into faculties of the brain and their annotated functions thus revealing hidden potentials in humans. In a re-issued book in (2000), he has provided spectacular profiles of newly discovered savants promoting new insights into the ramifications of savant intermittent spike in skills that are periodically experienced as a result of mastery.

In a doctoral thesis on savantism, (Young 1995) deals extensively with the case study of Trevor, a 12 years old music savant who exhibits severe autism. His thesis comprised three studies: the first one centered on Trevor and his musical talent, the second focused on his calendrical calculations, and the third's focal point was on psychometric evaluation as cognitive processes and IQ ratio. His findings indicated that savant skills are proportional to their savantism. Young's conclusions suggest that a savant is a neurologically handicapped person with outstanding intellectual ability and language which are observed in the realm of autism. Moreover, a savant shows a keen interest and preoccupation with specific areas of skills. To this end, the needed milieu for savants' development is good memory, an inclination towards high achievements, unflinching support from family and peerages, encouragement and assertions. Investigating savant syndrome from a different angle, Cowan et al. (2001) examine calendrical savants. They resort to pieces of evidence and speculations about these savants and how they respond to date questions. They investigated 10 savants who were administered to many arithmetical tests.

They conclude that there are many difficulties in making generalizations about such calendrical abilities. Many of these savants appeared within the range of ordinary people intelligence, none seemed exceptional. They maintain that calendrical savants are preoccupied with calendars and aspects pertaining to them as the calculation of dates, routines and similar practices. They further stress the fact that it is expedient to understand the talent of savants so that other areas of psychology as intelligence and learning would be unveiled. In a more encapsulating study, Treffert (2002) conveys a more comprehensive view of the condition citing examples encountered personally with prodigious savants in the domain of calendrical calculations, arts, drawing, sculpting, music, mechanical abilities, geographical and spatial skills. He also refers to language stunning abilities evident by some though extremely rare, and also mentions less reported skills as map memorization, visual measurement, extra sensory perception, enhanced sense of touch and smell ( as is the case of synesthesia). Treffert makes reference to the observable triad of genius, blindness and autism attributing premature birth history to such condition and its consequentiality ensue. He lists many world known savants and their islets of genius.

A relevant review on savant syndrome and its related issues has been the focus of Heaton & Wallace (2004). They believe that literature on savant syndrome has primarily dwelled on intellectual impairments that simultaneously coexisted with exceptional skills in certain domains. They reviewed cases of savants with developmental as well as clinical disorders that show average intellectual functioning. Their results indicate that there should be a shift of focus from IQ scores to encompass discrepancies existent between functional impairment and unexpected skills rather than exceptional ones. Additionally, they have observed that the incidence of savants is more prevalent in autistic individuals rather than in persons with other kinds of disorders. Therefore, they sought to explore the parameters of savant syndrome by introspecting skills in the light of neuropsychological accounts of autism. A major striking finding in non- autistic savants pertains to the presence of cognitive and behavioral traits with this disorder. Conclusions show that savant skills and autism are much connected the matter which calls for the investigation of autism to solve the rarity of this condition.

Bor et al. (2007) have conducted a single detailed case study in which the subject DT, (Daniel Tammet), a prodigious savant, a digit synesthete, a mnemonist, and a high functioning autistic savant who demonstrates outstanding skills in numerical memory and mathematical calculations. He shows preference for local processing and unusual brain activation while recalling digits. DT has digit synesthesia<sup>2</sup> and AS. Two preliminary investigations were carried out to see whether synesthesia and AS play a role in determining TD's savant memory and exceptional skills. Neuroimaging, fMRI digit scanning were done on the subject and the control group. The subject confirmed hyperactivity in lateral prefrontal cortex upon encoding digits. Controls, quite the opposite, showed raised prefrontal activation in response to structured sequences of digits. It has been observed that DT's neural activity showed no difference between the two conditions.

In the light of this, the researchers suggest that such observation reflects DT's less focusing on external mathematical structure as a synesthete where all digit sequences have internal structure. Regarding the neuropsychological investigation, they believe that AS people show a tendency to favor preferences to local features of stimuli. DT showed accord with having digit synesthesia which may be attributed to DT's impressive memory and calculation capability that are usually attributed to prodigious savants. They recommend the testing of neural pattern in charge of synesthesia and the cognitive pattern for AS in a series of identical cases and with more restricted control groups to consolidate the significance of this neural link. A detailed account of issues relevant to savant syndrome has been the prime concern of Darius & Valli (2007). They expounded savant syndrome, its causes, and theories and provided some accounts of well-known savants. A compare and contrast is done highlighting strengths as well as weaknesses. Theories explicated deal with left brain injury/right brain compensation, Waterhouse theory, weak central coherence theory, and the hyper-systemizing theory. They state that the overall problem with conducting research on savantism is the low incidence of subjects where a theory should account for a high prevalence. Having lengthily clarified each and every theory along with its weaknesses, they conclude that all their contributions partially explain savant syndrome. All these theories share basic parameters in clarifying areas of dispute. These are: baffling memory, heredity, systemizing skills, practice, interest and testosterone and its role in the passed-on genes. They further show that some traits are equally evident in other autistic developmental disorders. What is of utmost need is the applicability of the already existent facts of savant syndrome into the distinct range of variations. In a similar line of study, Morgan et al. (2007) carried out a case study on an autistic, apraxic, polyglot savant, C (Christopher), who is capable of learning languages without formal instruction and with utter ease. The subject had enormous difficulties in non-verbal cognitive realms, precisely with his visual-spatial abilities.

This matter prompted the researchers to investigate C's learning of BSL (British Sign Language), particularly his use of sign language classifiers. Then, they compared his outcomes with university honor students. The subject was administered to a battery of tests essential for data elicitation in grammar, negation, verb concord, semantics and others. Conclusions showed that C has shown sort of difficulties in learning sign language compared to learning other languages. His comprehension of sentences with varying degrees of difficulty of spatial and grammatical encoding along with performing on a placement task with classifiers exhibited inadequacy. He performed poorly on the grammatical sentences with negation and on verb agreement. The second test where he had to place objects on a table, he performed well upon dealing with real objects but failed to do so once placing them correctly when representing object placement in sign language.

<sup>2</sup> "A sensation experienced in a part of the body other than the part stimulated. For example, a sound may evoke sensations of color". Collins York English Dictionary (1999).

They conclude that their results are suggestive of the presence of a fundamental modality-dependent difference in the way a second language is processed and learned. In an exhaustive review of the content of a joint Royal Society and British Academy Discussion Meeting, Happé & Frith (2009) elucidate the concept of autism and the wellspring of talent. They revise numerous articles that deal with the association of autism that is characterized by severe intellectual limitation on the one hand, and achievements in one field on the other. They propose that the inclinations towards the narration of trivial details over prototype and generalizations underlie both talent and repetitive/ restrictive behavior in autism. (p. 1347). They acknowledge the fact that fostering talent and special interests is of chief importance in AS. It is equally imperative to understand why individuals with savant, splinter skills keep practicing; the matter which might yield an enhanced understanding of repetition that is seen throughout the autistic spectrum.

In turn, a better appreciation of the beautiful otherness of the autistic mind could possibly be achieved. (p.1349) Another area of interest is highlighted in Hiles & Hiles (2009). They present the case study of a male savant, Tim, 40 years old, who has serious sensory, communicative and physical retardation being both deaf and mute. However, he possesses a remarkable prodigious ability in drawing from realia and from his photographic memory. The researchers focus on Tim's terrific representations of narrative structure in the conveyance of his stories. They come up with the conclusion that the case of Tim is a unique one since all other reported similar cases focused mainly on verbal storying. Hence, they report three noteworthy features of Tim's study: drawing from memory, drawing with astute dimension and lastly, tracing his mental projected images on the paper denoting an exceptional iconic memory. In a recent study, Treffert (2009) provides a genuine contribution to savant syndrome past, present and future. He regards savant people as exhibiting mental disabilities but at the same time possess phenomenal 'islands of genius'- in using his own words- that are inharmonious with their overall limitations. He attributes such abilities to their extraordinary memory.

He likewise, gives a concise review of savants' prevalence, history epidemiology and perspectives for future research bearing in mind that their disability should not be seen as depriving them from their legal rights. He says that one in ten people with autism has savant skills. Moreover, 50% of these savants are autistic, while the other 50% display various developmental disorders as mental retardation, different kinds of brain diseases and injuries. Most importantly, he states that prodigious savants have the least disability. In a most recent study, Neumann et al. (2010), delve into the mind of a mnemonist aiming at investigating underlying brain mechanisms in a sample of autistic subjects with a savant memory. They report that 10% of autistic individuals show some form of islets of abilities once encountering serious mental and intellectual disabilities labeled as 'savant syndrome'. Seven mnemonist savants with high functioning autism spectrum disorder and equally seven matched controls underwent investigation. Measuring tools were the use of 151-channel whole-head magnet encephalography in a continuous old-new paradigm with standard stimuli as time and maps. Both groups were presented with 300 pseudo words and 300 shapes and then were required to indicate whether the presented stimulus had appeared before. Contrary to expectations, mnemonist savants did not score better than the controls, but scored better in the recognition of pseudo words. Analysis revealed activation of the brain areas in the right occipital region in savants while activation in left parietal region in controls.

As for the familiarity of shapes, earlier and more wide-spread bilateral old-new effects in mnemonist savants were noticed the matter which reflects their expertise with figural material. They necessitate conducting experimental study designs with multiple levels of difficulty to precisely measure the underlying brain mechanisms that boost greater performance. A new perspective in the study of savant syndrome is shown by Hughes (2010). He reviews savant syndrome from two angles, namely, congenital and acquired. Congenital draws on savants who are brilliant at calendar calculations, musical savants and hyperlexics who are impressively fast in reading a page in just 8 seconds and then recalling it at almost 99%. Other examples include drawing, map memory, poetry, painting and sculpting. On the other hand, acquired savantism is said when individuals are exposed to brain injury, damage or disease usually covering the left front temporal area of the brain. In the case of acquired savantism, the researcher explicates that there is a potential that everyone could be avid to this type in specific circumstances. Congenital savants are characterized by having enhanced local connectivity as a means to compensate for under connectivity of long-range fibers yet they have weak central coherence that is placed by attention to painstaking details, enhanced perceptual functioning and remarkable preoccupational obsessions with quite a narrow range of interests.

### ***Cause of Savant Syndrome***

Bound to the fact that there exists no encapsulating and overarching cognitive theory that verifies savant syndrome, no single theory is entitled to provide valid pieces of evidence. {As for the theories these merit a detailed investigation the matter which is beyond the scope of the present research paper} (For detailed accounts, cf. Darius & Valli, 2007; Heaton 2004; Treffert 1988, Snyder 2003, 2006, 2009 amongst others) The first medically- diagnosed case as having this condition dates back to 1887. Down provided a precise clinical picture of ten patients who showed massive memory along with special skills. He referred to what is now widely acknowledged term 'developmental retardation or mental afflictions. (cited in Treffert 2009 p. 1352) However, Down did not identify any of his patients as having autism. Retrospectively, his vivid descriptions were suggestive of savantism.

In short, no specific reasons were given to explain this condition. Down's overall observation was that his all male patients suffered from "verbal adhesion" denoting having a memory without reckoning. (cited in Treffert, 2006 b p.965) Treffert himself explains savant syndrome in terms of the left brain damage/ the right brain compensation theory. According to his view, most savants display deficiency in the left brain hemisphere anatomically associated with language and social adaptation, abstraction, science, math, order, practicality and perception. Consequently, he mentions what he calls 'the three R's: rewiring, recruitment and release where rewiring refers to remembering, how to use this memory and then how to release latent right brain capacities. (cited in the American Psychiatric News, 2010 p. 5) Treffert & Christensen (2005 p.109) emphasize the fact that savantism has to do with allocated functions of the brain encompassing the two right and left hemispheres.

They state that a dysfunction is observed in the left brain through undergoing brain imaging diagnostic tools as PET, MRI, and CT scans. {Positron Emission Tomography, Magnetic Resonance Imaging, Computer Tomography} Such deficiency is apt to be caused by traumatic brain injury or dementia. Elsewhere Treffert mentions that this condition is either genetic or acquired where other developmental disorders are contemporaneous. These disorders include a brain injury that occurs prenatal, peri- natal and post-natal, i.e., before, during and after birth, eventually later in life. (Wisconsin Medical Society).

Similar causes are attributed to the long-standing theory of left hemispheric damage in accordance with Treffert & Wallace (2002 p. 78; Hughes 2010 p. 149). This damage causes what is referred to as 'tyranny of the left hemisphere' in which emergence of abilities due to lack of interference, is seen in the performing of the right hemisphere functions. This tyranny gives rise to the right at the expense of the stagnant, dysfunctional left. In some cases, a sudden appearance of savant syndrome is reported by people who have dementia the matter which raises speculations about the presence of dormant, innate and suppressed geniuses in all people. By the same token, Snyder & Mitchell (1999 p. 588; Snyder 2009 p. 1399) believe that savants have privileged access to lower level, less-processed information in some interim (primitive) state, normally inaccessible through introspection due to being suppressed. These areas pertain to vision, sound and numbers. Elsewhere, they maintain that it could be available to other non-savants by temporarily switching off certain brain areas so that artistic genius can be stimulated and hence, instant savant-like skills are unlocked shuttling the needed information. This is achieved only through the induction of artificial means like repetitive magnetic pulses as rTMS (Transcranial Magnetic Stimulator) in which these tools are applied to parts of the brain which in turn disrupt the electrical activity of the nerve cells for seconds. (Snyder et al. 2003 p. 152; Young et al. 2004 p. 219; Snyder 2006 p. 837; Snyder 2004 p. 35 ) Other researchers believe that Snyder's theories resemble 'the X-files' in being utterly indicative calling for empirical studies of the human mind. (Ramachandran 1998 cited in Osborne, 2003 no page).

Treffert & Christensen (2005 p.109) cite the example of a very-well known savant, Kim Peek, who upon undergoing MRI brain scanning, showed an absence of the corpus callosum, {according to the Encyclopedia of Psychology, is an extensive bundle of over a million nerve fibers that connects left with right brain hemispheres} a nerve tissue that connects the two halves of both brain hemispheres, thus attributing this absence as a prime cause of abnormality. They further argue that left hemispheric damage is likely to explain the outnumbering of males over females not only in savants, but also in dyslexia, stuttering, delayed speech and autism. Nevertheless, Geschwind & Galaburda, a Harvard neurologists, (1985a p.430) suggest that the cause of savant syndrome is bound to the effect of the high circulating levels of the male hormone, testosterone, which can become neurotoxic on developing fetal brain 'normally in the ninth to tenth weeks of the embryonic phase' which might restrain the growth of the left brain cortex resulting in compensatory right brain growth. As a result, they call it testosterone poisoning which equally has impacted the outnumbering of males over females bearing in mind that it is responsible for male sex characteristics. Irrespective of the various theories, researchers have exerted their sterling efforts to explain this rare condition be it dealing with the brain, being congenital or acquired, or being a severely or mildly handicapped person all of which need guidelines on how to deal with individuals with savant syndrome.

### ***Savants' Polished Profile***

Research has conveyed a flamboyant portrayal of the general characteristics of savants. A consensus is that savants have overwhelming memory as an integral part that welds the condition regarding their overall limitations. Another worthy observation is that of the high threshold terms, prodigy and genius, that are solely reserved for prodigious savants. Some savants have many skills at one time, yet others may exhibit just one solitary skill. Moreover, prodigious savants may also show variation within the same domain of brilliance. An added worthwhile remark is that the vast majority of savants fail to provide a comprehensive, justifiable account of their condition, in other words, they simply can not explain how they do it or why, except for one savant, Daniel Tammet, who is an author, public speaker, high functioning autistic, a savant and a synesthete. (Wisconsin Medical Society). On the whole, savants are rather of a relatively low intelligence having some peak abilities yet displaying valleys of disabilities. Their general appearance is that of the mentally retarded. (Darius & Valli 2007 no page) Prodigious savants have captured researchers' undivided attention in the way they are portrayed as opposed to splinter and talented savants. Their areas of expertise include

(a) Phenomenal memory: this is best exemplified in memorizing statistics, telephone directories, transportation schedules (Hiles 2002 no page); having narrow but deep memory based on habitual recitation (Treffert & Wallace 2002 p. 80); having striking feats of memorization (Darius & Valli 2007 no page ); having feats of memory that are due to the right hemisphere dominance being the seat of concrete, direct and artistic, non-symbolic skills (Hiles 2002 no page); having knowledge of concrete direct concepts is prevailing as memory and art due to damage in the left brain ( Hewett 2010, no page); having a memory and information processing mechanisms that underpin intelligence ( Nettelbeck & Young 1999 p. 141); possessing photographic memory in terms of picturing vibrant mental images. (Goodman 1972 p. 268; Hermlin 2001, cited in Hiles & Hiles 2009 p. 40 ); possessing eidetic memory where the image of an object remains in someone's mind up to 40 seconds (Treffert 2006 p. 46);

having the ability to memorize, and to pay attention to painstaking details, having the skill of repetition (Hermlin 2001, cited in Hiles & Hiles 2009 p. 40); having the ability to recall trivial details (Sacks 2007, cited in Snyder 2009 p. 1399); having impressive rote memory (Thioux 2006 p. 1157); speedy answering due to extraordinary memory requiring no extra complicated mental procedures (Welling 1994 p. 201); and being good at remembering birthdays (Howe et al 1988 p. 451).

(b) Lightning abilities: these show remarkable capacities in arithmetic calculations as multiplications, subtraction, square roots, computing prime numbers often in conjunction with the inability to perform even simple math problems (Sacks, 1985 p.17)

(c) Calendrical and numerical calculations: this is best illustrated in the way savants show their expertise in telling the date on which a day falls or vice-versa telling the day on which a date falls, forwards and backwards, be it past, present or future (Cowan et al. 2004 p. 169; Sacks 1985, cited in Hiles 2002, no page)

(d) Musical prowess: this ability is pertinent to music performance especially piano and jazz. (Treffert 2009 p.1353); musical precocity (Cowen et al. 2001 p. 53); creative composing, (Silberman 2003 no page); in some cases, prodigious savants have the triad of genius as blindness, musical creativity and learning disability. Some replicate what they heard for just one time with perfection (Howlin et al. 2009 p. 1360); exhibiting a rather high percentage of absolute pitch (AP) (Snyder 2009 p. 1399)

(e) Artistic ability, mechanical dexterity and aptitude as repairing machines. Savants excel in painting, sculpting and drawing. In some instances, drawing is performed by blind savants as is the case of Tom. (Treffert 2009 p.1354; Young 2001 p. 420)

(f) Spatial/geographical skills as map making, direction orientation and keenness on measuring distances, route identification (Treffert 2009 p.1354)

(g) Less-frequently reported traits are outstanding sensory discrimination in smell, touch or vision ( as is the case of Daniel Tammet 2006; Bolte & Poustka 2004 p. 121; Young, 2001 p. 421, ); deep knowledge in neurophysiology, statistics and navigation (Treffert 2009 p. 1353); coordination skills (Tredgold 1952, Rimland 1978, cited in Howlin 2009, p.1360), and polyglottism as a truly rare incidence where a command of around 15 to 20 languages is reported. Other realms include poetry. (Smith & Tsimpli, 1993 p 280; Nettlebeck & Young 1999 p.140); the ability of language acquisition is likened to super-computers, (Silberman 2003 no page); having verbal representations and pseudo-verbal skills, hyperlexia and the acquisition of foreign languages. (Howlin et al. 2009 p. 1360)

### ***Savants' Gloomy Profile***

(a) Savants are mostly cognitively retarded individuals, an obstruction which puts them in the shackles of being house-bound to the extent of reclusion. In very rare cases, they mingle and interact with their communities as is the case of Kim Peek. (Treffert 2010). Their overall handicap constitutes a stumbling block towards every day living. By savant children, they have fewer friends due to their demanding nature from their peers and acquaintances. (Winner 2006 no page). Likewise, by gifted children with an IQ above 150 which is far above average, they are avid to failure due to pressure placed on them for excellence which might eventually lead to 'emotional paralysis'. They are also subject to what psychiatrists call 'a false self'. Bound to high expectations from others, they might even conceal or camouflage their own needs (ibid). Osborne (2003 no page; Tammet 2006 p. 55) refer to their impeded, isolated clusters of excellence that in comparison with their observable disability as a contributing factor to aloofness and withdrawal from the nuanced, colored fabric of social life. Their enormous disability is a hindrance towards self-expressions. (La Fontaine 1974 p. 32) Rohan (2010 no page) regards them as 'medical mysteries.'

(b) Having a subnormal IQ coupled with mental disorder paves the way for mimicry/ parroting and echolalia. New Encyclopedia Britannica (cited in Warren 1996 no page; Barr 1898 p. 26; Mottron et al. 2009 p. 1387)

(c) Possessing the two sides of the coin, negative as well as positive traits that are complementary to each other, they are likened to day and night; darkness and light. (Warren 1996 no page)

(d) They are illiterate and untrainable yet infallible in very restricted areas. They have tunnel vision, are incapable of understanding abstraction and fall short of data out-dumping skills, (Pearce 1992 pp.4,5); and are unresponsiveness to their physical environment. (Howe et al. 1988 p. 417)

(e) Impoverished language skills (Bates 1997 p. 163)

(f) A lack of abstraction bound to the left brain damage usually in charge of language. (Snyder 2006 p. 840)

(g) Some severely disabled savants are institutionalized with regard to their inability to look after themselves. (Smith et al. 1993 p. 280)



(h) Having a memory without reckoning, ‘exultation of memory’ according to Gritchey 1979, and an automatic memory according to Tredgold 1914, exaggerated form of habit (cited in Treffert 2009 p. 1353); a non conscious habit (Mishkin et al 1984 p. 69); verbal adhesion, Down 1887(cited in Treffert 2009 p. 1353).

### **Some Exceptional Savants**

The researcher has deliberately attempted to select investigating the cognitive profile of three savants in the most prominent fields of expertise arithmetic and music. A third domain is in the less recurrent field of language; two male savants are contemporaries and the third one, a female savant, is a manifestation of the triad of musical prodigy, blindness and mental retardation.

**Kim Peek:** (1951 – 2009) is a native speaker of American English, mega savant, a mnemonist, speed reader and calculator. Savant syndrome has witnessed a quantum leap in drawing the world’s attention to this rare condition. Utterly tabooed and woefully neglected, it has gained global recognition and international prominence after the case of Kim Peek has been popularized by the movie industry in the four Oscar-winning movie “Rain Man” in 1988. It got public notice after a renowned American actor, Dustin Hoffman, starred the case of Kim serving as an inspiration for the fictional character Raymond Rabbit, a mathematical genius. Ever since, a turning point has been apparent in literature and people’s views. Peek was known as mega savant due to his wide knowledge of over 15 subjects. He was born with macrocephaly and congenital brain anomaly mainly, a mal-formed cerebellum, with the absence of corpus callosum, a group of nerves that connects both right and left brain hemispheres. Simply formulated, this connecting nerve in charge of communication between the two halves of the brain was missing.

He also had an enlarged head with a blister on the right side of his skull, additionally, he had below average IQ. (Treffert 1988 p.565) Other researchers (Opitz et al.2008 p. 128) ascertain the fact that Peek had FG syndrome, a rare genetic syndrome that is linked to the X chromosome which is the cause of some physical defects as hypotonia {low muscle tone} and macrocephaly {abnormally large head}. (Treffert & Christensen 2005 p. 110) speculate that due to the non-existent corpus callosum, certain neurons have provoked other connections and as a consequence, an overwhelming enhanced memory has been demonstrated. Elsewhere this absence is referred to as ‘agenesis’ (Moran 2010 p. 15). At the personal/social level, he was a recluse, had poor motor coordination skills, showed physical awkwardness as the inability to dress himself, unbutton his clothes, untie his shoe laces or even go to the lavatory.

However, after the movie was released, his autism diminished and his social interaction flourished. Kim was called a walking encyclopedia; and ‘kim-puter’ with reference to his incredible brain abilities in calculating, high knowledge of geography, classical music, space programs, acting, literature especially Shakespeare, the Bible, church history, history and sports. He learned by heart 8,600 to 9,000 books, he knows all the highways that connect each and every state in the States, their postal zip codes, television stations and telephone networks. What is perplexing is the fact that his reading/scanning techniques involved reading two pages at one time, one page with his left eye and the facing page with the right one in 8 to 10 seconds; he can also read upside down or from the sides of the page. (Hewett 2010 no page). Hiles (2002 no page) attributes this unusual way of reading to his anomalous brain which allows both hemispheres to communicate concurrently. Peek, the senior, (Peek 1996 p. 21) talks about Kim’s having ‘a knowledge quotient’ that is comparable to Einstein. In 2004, NASA scientists ventured performing many computerized brain tests as tomography and MRI to obtain a three dimensional view of Kim’s brain in attempts to discover underlying brain mechanisms contributing to his case.

**Brittany Maier:** (1989- ) a native speaker of American English with German roots, a savanté , impaired vision, an autistic musical genius, pianist, composer, philanthropist and motivational performer. Brittany was prematurely born and was given a slight chance of survival due to her overall health condition. She started playing on a toy piano at the age of six. Being highly capable of reduplicating whatever she hears without formal training, she has unveiled her potentials into becoming a well-known savanté nationally and internationally. Her genius is apparent in the composition of more than 15,000 pieces as current enrichments of her music repertoire. One peculiar aspect is that she plays the piano with only six fingers though all are normal. She has performed in famous world arenas inspiring thousands of young and old people alike. (Treffert, Wisconsin Medical Society, no page)

**Christopher Taylor:** (1962- ) a native speaker of British English, mildly autistic, hyper polyglot savant, an apraxic, mentally retarded. Christopher was born as a normal child with no obvious disability. At the age of six he was brain damaged with unusual shape and size due to severe dysfunctions of motor skills amounting to apraxia. He was poor-sighted and partially speech-defected.

His overall development was somewhat default being late in walking and talking. His medical history shows that he underwent MRI scan diagnosing moderate cerebral atrophy with wide sulci over both hemispheres. (O'Conner & Hermlin 1991 p. 674 cited in Smith 1995 p. 12) By the age of three, however, he showed remarkable keenness on reading, particularly, the French books of his elder sister. Parents showed no genuine interest on his early reading abilities 'hyperlexia' due to his retardation. (Smith & Tsimpli 1995 p.19: O'Conner & Hermlin 1991 p. 674 cited in Smith 1991 p. 336). Other researchers have equally dwelled on his language prowess, speedy and correct acquisition of vocabularies and his incessant obsession of acquiring new lexical items from many different languages, an obsession that has been nurtured ever since. (Hermlin 2001 cited in Pring 2005 p. 500). The case of Christopher is globally unique as a single case in the history of literature the matter which prompted Smith to call him a talent wonder. It has turned the knowledge of this day and age upside down in terms of failing to provide empirical evidence for savant polyglottism according to Smith.

Savants are rarely gifted in languages and rarer than females in language giftedness. Treffert (2005 p. 28) and Bates (1997 p. 163) mention that most savants have poor language skills weaker than their non linguistic potentials. Conversely, Professor Neil Smith from the UCL has been studying his case for over twenty years. His monthly visits are intended to test Christopher's linguistic and psychological behavior; a double dissociation between language and non-linguistic cognition. Christopher lives in an institution for the mentally disabled. His knowledge of languages is attained from reading books and newspapers, but mostly from real life encounters, realia and interactions with people in public places in the company of Dr. Smith. Christopher does not know how to reach any of these destinations on his own though he knows these places as locations very well since he has been living in the area for over twenty years. Smith acknowledges Christopher's acquisition of more than twenty languages ranging from complete fluency to mere bare vocabularies from Indo-European to exotic. He knows German, Danish, Finnish, Modern Greek, Italian, Spanish, French, Polish, Portuguese, Norwegian, Swedish, Turkish, Welsh, Russian, Dutch and Hindi.

Furthermore, he can identify some other languages from their orthography: Bengali, Chinese, Czech, Arabic, Hebrew, Japanese, Icelandic and Gujarati<sup>3,3</sup> Gujarati is an Indo-Aryan language, and part of the greater Indo-European language family. It is derived from a language called Old Western Rajasthani (1100 - 1500 AD) which is the ancestor language of the modern Gujarati and Rajasthani languages. It has a total of 46 million speakers worldwide. Adopted from [www.wikipedia.org/wiki/Gujaarati\\_language](http://www.wikipedia.org/wiki/Gujaarati_language) Retrieved on 8/2/2011.

He can distinguish between Chinese Mandarin and Chinese Cantonese. His knowledge extends to a meager knowledge of a few other languages. (Smith 1995 pp. 18-20) His talent extends to other realms as playing various word games in which he shows dazzling instantaneous response as when prompted to deal with the word 'disaster' by means of which he elicited the words: star, sister, dare, tea, aster, Sid, ride, read, teas and tears. Likewise, he dealt skillfully with the German<sup>4</sup> word 'regenschirm' which means 'umbrella' by means of which he extracted the words: 'schirm' small umbrella ; 'ich' I, 'mein' my, 'schnee' snow and 'regen' rain which are perfectly constructed. (ibid) Smith has observed this asymmetric profile where he masters acquiring languages smoothly while scoring poorly on specific semantic and pragmatic tasks. (Smith & Tsimpli 1995 p.19)

Nonetheless, what is astonishing about Christopher is the fact that he can read upside down or sideways. His overriding concern is how to deal with languages, collect lexical items from different languages, converse with people using these languages and establish social rapport only around the realms of languages, but apart from that, he does not mingle. Smith presented him with 'Berber' an Afro-Asiatic, non-European language spoken in North Africa, Morocco in particular. A major characteristic of this language is its richness in the inflectional system. It has syntactical sentences without a subject that would equal sentences like: goes home, which is rightly understood as she is going home or she goes home. Similarly, go home, means I am going home, or I go home in this language but not in English. Christopher was tested on this issue and he spontaneously performed all the sentences correctly leaving the subject out just like native speakers. Smith argues that the theory of the Chomskyan innate universal grammar is valid and applicable even in the case of Christopher, the language savant. Upon being asked how to describe the whole process of leaving the subject out, Christopher could not provide any answer. (Smith et al. 1993 p. 281).

Smith & Tsimpli (1995 p.20) presented him with Epun, an invented, artificial language that does not exist in the world and could not be acquired by ordinary children. It contained structures that violated universal grammar principles. Some examples are cited on the use of the past tense and negation. His answers were 100% totally mistaken on the tense and 70% on negatives while in the controls they showed correct answers in both tenses and negation denoting that his central system is damaged and hence is incapable of working outside language faculty, whereas his language system is highly intact.

(Smith & Tsimpli 1991 p.335) have provided compelling evidence about the segregation of language and cognition keeping in mind language faculties and the idea of innate universal grammar. Additionally, Smith (2010) is studying the signs of a savant in Christopher, by means of which his subject is learning BSL (British Sign Language), as a vital part of the tested UG theory and also to be able to delve into the human brain, the composition of memory and the modularity of functions. <sup>4</sup>The researcher is a polyglot of English, German and Arabic as the mother tongue language and a smattering knowledge of Greek.

### **Some Savants' Peaks**

- Kim Peek, nicknamed as 'a walking encyclopedia and Kim-puter', has the ability to scan two facing pages with enormous speed with his both eyes one scanning the left and the other the right in 10 seconds. (Treffert 1988 p. 565 ) He changed the stereotypical, negative image of the disabled by addressing around two million people during his lifetime exemplifying a genuine example of the powerful potentials of the mentally retarded. (Moran 2010 p. 14)
- Christopher Taylor, nicknamed as 'the talent wonder' is a hyper polyglot savant who is mentally retarded and autistic. He masters over twenty languages with varying degrees of speaking, writing and translating though without formal instruction. Additionally, he is incredibly skillful at playing miscellaneous word games, anagrams and crosswords. (Smith & Tsimpli.1995 pp. 18-20)
- Stephen Wiltshire, a British architectural artist, nicknamed as 'the human camera', is a combination of arts and visual memory. He has got marvelous drawing abilities to draw extended landscapes of cosmopolitan cities after seeing them one time from a helicopter. <http://www.stephenwiltshire.co.uk/>; <http://news.bbc.co.uk/2/hi/health/1211299.stm>
- Richard Wawro, a British artist. He exemplifies the triad of blindness, prodigy and cognitive handicap. He draws, paints and sculpts reaching a master-like standard. His crayon drawings are so pricey reaching up to \$10,000 each.
- Leslie Lemke is an American music savant. After removal of his eyes at early age due to severe birth defect, he showed early signs of talent playing 'Tchaikovsky's Piano Concerto No. 1.' after a single time of listening. He used to give concerts around the world.
- Tony DeBlois is a jazz virtuoso. He graduated with magna cum laude showing a mastery of playing 22 instruments. (Treffert , Wisconsin Medical Society, no page)
- Florence 'Flo' and Katherine 'Kay' Lyman, female calendar calculator twins, human computers. They can tell the day on which a day fell in the past, when to happen in the present and thousands of years in the future. [www.examiner.com](http://www.examiner.com)
- Daniel Tammet: British autistic savant, author and best seller of his memoir *Born On A Blue Day* in 'New York Times' magazine making reference to his epilepsy, synesthesia, Asperger's syndrome and savantism. He has natural aptitude to learning languages. He speaks eleven languages: English, French, Finnish, German, Spanish, Lithuanian, Romanian, Estonian, Icelandic Welsh and Esperanto. He invented a language of his own 'Manti' which is based on Finnish and Estonian vocabularies and grammar. He blends science and personal experience into a well-woven piece of arts. (Tammet 2006, 2009.)
- Nadia. A Ukrainian female autistic savant and artist. Despite her inability to speak fluently, she has got dazzling talent in drawing from her photographic memory. She started drawing professionally and without didactic training at the age of three and a half years. She draws images of animals, people and other objects from her memory even months after seeing the image by her tracing back, selecting and retrieving abilities. (Rayala, 1981 pp. 70-72)
- Ping Lian Yeak is a Malaysian teenager who is an artistic, autistic savant, nicknamed as 'the autistic hero' He is exceedingly talented and has got his own art exhibitions in the world's most famous galleries as in New York, Tokyo, USA, and Malaysia. One of his paintings, 'Ubudaih Mosque 1' has been sold for RM 100,000.00 to an anonymous benefactor bidder in raise funding for the disabled. [www.pinglian.com](http://www.pinglian.com); Wisconsin Medical Society
- Henriett Seth is a Hungarian female autistic savant artist. She is a highly esteemed poet and writer. She has published two books and has acquired the Gypsy language. Wisconsin Medical Society
- Tom Bethune was a manifestation of the triad of genius, blindness and impairment. A slave who lived in the plantations of Georgia and Virginia in 1862. Given the negative associations of slavery at that time, he excelled as a pianist virtuoso, in playing pieces of music genius of their time as Beethoven, Verdi, Chopin and Bach amongst others. His own composed repertoire of musical pieces amounted to almost 5,000 songs. (Rush 1789 p. 62; Treffert, Wisconsin Medical Society; Snyder 1981 pp. 2, 3.)

**Discussion**

The exponential expansion of scholarly research on savant syndrome and its interdisciplinary domains have somehow contributed to the unfolding of the syndrome. Nonetheless, an unraveling of the hidden workings of the brain and their impact on savants need more investigation. Savant syndrome is a serious condition at various levels: individual, familial, communal and societal. Depending on its mental/physical severity, it can even hamper the accomplishment of simple every day chores as evident in severely retarded savants. Savants are individuals who show marked genius in particular areas of expertise yet lag in other equally important domains. Their minds tend to focus on just one single activity to the exclusion of all other ones as being sealed off. Mal-functioning motor skills, poor cognition and overall mental disabilities are some observed traits. Their memory is momentous but their IQ does not conform to the standardized intelligence tests having it below 25. To many researchers, unleashing of some abilities while sealing off others, remains a riddle despite many theories, diagnostic tools, brain imaging techniques and a huge body of research. (Treffert 2005; Snyder 2009; Smith & Tsimpli 1995, 2011; Hermlin & O'Conner 1986) However, the stereotypical view of this category of people is rather dim portraying them as imbecile, pathetic, incapable, burdensome and generally, not at ease to be and deal with.

By the same token, published literature has conveyed a rather gloomy picture coupled with negative assessment. By contrast, some researchers have demonstrated positive views about islets of genius and prodigy showing average, below average, and in rare instances, exceptional, savant skills. Their array of brilliance is wide-ranging including arithmetic, calendar calculations, music, arts, mechanical and spatial skills, and geographical orientations (scientifically, are functions of the right brain hemisphere.). On the other hand, as previously mentioned, language savants are extremely rare and their scarcity is related to the left brain hemisphere that is either damaged from birth as congenital or acquired as in brain injuries or diseases. (Treffert 1989; Tammet 2006, 2009, Smith et al. 2010) In the case of Christopher, the polyglot savant, he is completely unique. Due to left brain damage, the acquisition of languages would be out of question in the case of savants since it is purely a left brain function. In contrast, the right brain functions have to do with music, math, art and the like, these domains that savants are skillful at.

In this regard, Christopher is a prodigy in language that does not fit the right-brain hemisphere functional profile, so to speak. So far, no research has given how and why this is the case by Christopher. Moreover, what is peculiar about Christopher is that in spite of his excessive acquisition of umpteen languages, he fails to communicate properly with others; so these do not serve as a form of communication per say, but rather as an open window to see the outside world. Smith (1995 p. 23) admits that no adequate theory has fully expounded the causes of the coexistence of these abilities and disabilities. After all, Christopher's brilliance in the confines of his mastery of polyglottism defeats the purpose of successful communication or even benefiting other retarded people, it can only serve research purposes, regrettably. In this regard and contrary to expectations, Christopher contributions are one-sided, and not as initially proposed, a multi-faceted figure. The researcher advocates the view that a reshuffling of investigated studies should be done in order to get a clear picture of savant syndrome.

It also would be expedient to conduct studies on splinter and talented savants. Hitherto, studies on prodigious savants have been on the splurge yet splinter and talented savants are of rarity though they function as equally good candidates to unravel the mystery of the human mind. Researchers are somehow inclined to carry out studies on prodigious savants, eventually because they are more rewarding in terms of their rich contributions to the human mind and to research in general. A final implication has to do with the exact information about the number of highly regarded artists, mathematicians, musicians, arithmetic and calendrical calculators who had this condition in the course of history. This undertaking is significant in eradicating negative associations attributed to them. Simultaneously, it might inspire other disabled people to value themselves and deal with every day living from a more positive perspective. Experienced researchers have acknowledged the tremendous impact it could have on them and their families as apparent in the words of (Treffert & Wallace 2002 p. 16):

Encouraging the exceptional abilities of savants can help them develop greater social skills, language acquisition and independence.

In the light of this, it is high time to destigmatize their status from all the stereotypical and judgmental labels they have been destined with ever since. To accentuate the positive aspects of their abilities is a first step towards inching to this goal. Shouldering a responsibility has never been accomplished haphazardly neither has aiding individuals in the bottleneck of their calamity. To this end, it is each and every one's onus, predominantly academics.

In the words of Treffert: (Wisconsin Medical Society) ultimately there is a little 'rain man' in each one of us, hence, 'they are national treasures wherever they are located'. To this conclusion, the researcher succumbs.

## References

- American Association Of Mental Deficiency Retrieved from [http://en.wikipedia.org/wiki/American\\_Association\\_on\\_Intellectual\\_and\\_Developmental\\_Disabilities](http://en.wikipedia.org/wiki/American_Association_on_Intellectual_and_Developmental_Disabilities) on 10/2/2011
- APPI American Psychiatric News: Newspaper of the American Psychiatric Association  
James P. Krajeski, M.D. (Ed) Retrieved from <http://pn.psychiatryonline.org> on 13/1/2011
- Barr, M.W. 1898 Some Notes On Echolalia, With The Report Of An Extraordinary Case. *Journal Of Nerves And Mental Disorder* Vol. 25, pp. 20-30
- BBC News (10 March 2001). Fragments of genius: Unlocking the brain's potential. <http://news.bbc.co.uk/2/hi/health/1211299.stm>
- Bates, E. 1997 On Language Savants And The Structure Of The Mind *International Journal Of Bilingualism* Vol.1(2) pp. 163-179
- Barnes, R., & Stephen M. 1995 Problems with the Savant Syndrome: A Brief Case Study. *British Journal Of Learning Disabilities* Vol. 23 (3) pp. 124-126
- Bölte, S. & F. Poustka 2004 Comparing The Intelligence Profiles Of Savant And Nonsavant Individuals With Autistic Disorder *Intelligence* Vol. 32 pp. 121-131
- Bor, D. Billington J. & Baron Cohen S. 2007. Savant Memory For Digits In A Case Of Synesthesia And Asperger Syndrome Is Related To Hyperactivity In The Lateral Prefrontal Cortex *Neurocase* Vol. 13(5, 6), pp. 311-319
- Charness, N., Clifton, J., & MacDonald, L. 1988 Case Study Of A Musical 'Mono Savant': A Cognitive-Psychological Focus. In L. K. Obler & D. Fein (eds) *The Exceptional Brain: Neuropsychology Of Talent And Special Abilities*. pp. 277-293. New York: Guilford.
- Collins York English Dictionary (1999) Harper Collins Publishers
- Cowan, R., O'Conner, N., & Samella, K. 2001 Why And How People Of Limited Intelligence Become Calendrical Calculators. *Infancia. Y. Aprendizaje* Vol 93(24), pp. 53-65
- Cowan, R., et al. 2004 The Development Of Calendrical Skills *Cognitive Development* Vol. 19 pp. 169-178
- Darius, H., & Valli, K. 2007 Savant Syndrome-Theories And Empirical Findings. University Of Skövde, Sweden
- Dowker, A., et al 1996 A Savant Poet *Psychological Medicine* Vol. 26 pp. 913-943
- Down, J. L. 1887 *On Some Of The Mental Afflictions In Childhood And Youth* London: Churchill
- Encyclopedia Of Psychology*. 2000 Savant Syndrome Vol V. pp 144-148 London: Cambridge University Press
- Encyclopædia Britannica*. (2011). Autism. Retrieved from <http://www.britannica.com/EBchecked/topic/44667/autism> on 15/12/2010
- Encyclopedia Britannica*. Retrieved on 22/8/ 2010, from Encyclopedia Britannica Online: <http://www.britannica.com/EBchecked/topic/458883/Physique-and-Character> on 15/12/2010
- Fitzgerald, M. & Corvin A. 2001. Diagnosis and Differential Diagnosis Of Asperger Syndrome *Advances In Psychiatric Treatment* 7, pp. 310-318
- Geschwind, N., & Galaburda, A.M. (1985a). Cerebral lateralization: Biological mechanisms, associations, and pathology: I. A hypothesis and a program for research. *Archives of Neurology*, Vol 42, pp.428–459.
- Gritchey, M. 1979 *The Divine Banquet Of The Brain* New York, NY: Raven Press
- Goodman. J. 1972 A Case Study Of An 'Autistic-Savant': Mental Function In The Psychotic Child With Markedly Discrepant Abilities. *Journal Of Child Psychology And Psychiatry* Vol. 13 pp. 167-278
- Happé, F., & Frith, U. 2009. The Beautiful Otherness of the Autistic Mind *Philosophical Transactions of the Royal Society* Vol. 364, pp.1345-1350
- Heaton P, Wallace, G. 2004. "Annotation: The Savant Syndrome." *Journal of Child Psychology & Psychiatry* Vol. 45 (5) pp.899–911.
- Hermelin. B. 2001 *Bright Splinters Of The Mind*. London: Jessica Kingsley Publishers
- Hermelin. B., & O'Conner, N. 1970 *Psychological Experiments With Autistic Children* Oxford: Pergamon Press

- Hermelin, B., & O'Conner, N. 1986 Idiot Savant Calendrical Calculators: Rules And Regularities *Psychological Medicine* Vol. 16 .pp 885-893
- Hewett, C. 2010 The Thought Process Of Savants Massachusetts Academy Of Math And Science. Retrieved from [www.scienciereview.org/pdfs/122.pdf](http://www.scienciereview.org/pdfs/122.pdf) on 15/10/2010
- Hiles, D. 2002 Savant Syndrome. Retrieved from <http://www.psy.dmu.ac.uk/drhiles/savant/20%syndrome.htm> on 9/11/2010
- Hiles, D., & Hiles, E. 2009 Savant Syndrome: An Unusual Case Of Narrative Ability In *Narrative, Memory And Identities*. University Of Huddersfield: Huddersfield pp. 39-52
- Hill, A. L. 1978 Savants: Mentally Retarded Individuals With Special Skills. *International Review Of Research In Mental Retardation* (Ed N. Nills) pp. 277-298 New York, NY: Academic Press
- Howe, M.J.A., Davidson., J.W., & Sloboda, J.A. 1988 Innate Gifts And Talents: Reality Or Myth? *Behavioral and Brain Sciences* Vol. 21 pp. 399-442
- Howe, M.J.A., & Smith, J. 1988 Calendar Calculating 'Idiot Savants': How Do They Do It? *British Journal Of Psychology* Vol. 79 pp. 371-386
- Howlin, P., et al. 2009 Savant Skills In Autism: Psychometric Approaches And Parental Reports *Philosophical Transactions of the Royal Society Biological Sciences* Vol. 364, pp. 1359-1367
- Hughes, J.R. 2010 A Review Of Savant Syndrome And Its Possible Relationship To Epilepsy. *Epilepsy & Behavior* Vol.17 (2):pp.147-52.
- Jolliffe, T., & Simon Baron –Cohen 1997 Are People With Autism And Asperger Syndrome Faster Than Normal On The Embedded Figures Test? *Journal Of Child Psychology And Psychiatry* Vol. 38 pp. 527-534
- Kanner, L 1943. Autistic Disturbances of Affective Contact. *Nervous Child* No 2, pp. 217-225
- Kraepelin, E. 1919. *Dementia Praecox and Paraphrenia in Textbook of Psychiatry* (8<sup>th</sup> edn) pp. 176-177 Edinburgh: E.S. Livingstone
- LaFontaine, L. 1974 Divergent Abilities In The Idiot Savant. Unpublished Doctoral Thesis, Boston University School of Education: Boston
- Miller, L. 1998 Defining The Savant Syndrome *Journal Of Developmental And Physiological Disabilities* Vol 10 pp. 73-85
- Mishkin, M., Malamut, B. & Bachevalier, J. 1984 Memories And Habits: Two Neural Systems. In *Neurology of Learning And Memory* (Eds G. Lynch, J.L. MacGaugh & N.M. Weinberger), pp.65-77. New York, NY: Guilford Press.
- Morgan, G., et al. 2007 Classifier Learning And Modality In A Polyglot Savant. *Lingua* pp.1339-1353
- Moran, M. 2010 Autistic Savant Made Famous by 'Rain Man' Dies - What Is New In Understanding of Syndrome? *Neurology Today* Vol 10 (3) pp. 14–15
- Moritz, K. P. 1783 Gnothi Sauton. Magazine For Experimental Knowledge Of The Soul As A Reader For Scholars And Laymen . *Journal of Empirical Psychology* pp. 1783-1793 Berlin, Germany: August Mylins Retrieved from [journals.cambridge.org/article\\_S003329170002030390](http://journals.cambridge.org/article_S003329170002030390) on 26/1/2011
- Mottron L, Dawson M, Soulières 2009 Enhanced Perception In Savant Syndrome: Patterns, Structure And Creativity . *Philosophical Transactions of the Royal Society Biological Sciences*. No 364 (1522): 1385– 1391
- NODCC 2007 National Organization For Disorders Of The Corpus Callosum. Retrieved from <http://www.nodcc.org> on 19/1/2010
- "NASA Studying 'Rain Man's' Brain"; Associated Press/Space.com, November 8, 2004.
- Nettelbeck T, Young R 1996 Intelligence And Savant Syndrome: Is The Whole Greater Than The Sum Of The Fragments?. *Intelligence* Vol. 22 (1): pp.49–68.
- Nettelbeck, T. & Young, R. 1999 Savant Syndrome. *International Review of Research in Mental Retardation*. Vol 22, pp. 137-173 New York: Academic Press
- Neuman et al. 2010. The Mind of a Mnemonists: An MEG and Neuropsychological Study of Autistic Memory Savants. *Behavioral Brain Research* Article in Press Doi:10.1016/J.Bbr.2010.07.008
- Osborne, L. 2003 Savant For A Day. *The New York Times Magazine*
- Opitz JM, Smith JF, Santoro L September 2008. The FG syndromes (Online Mendelian Inheritance in Man 305450): perspective in 2008. *Advanced Pediatrics* Vol. 55 (1) pp.123–170.
- Pearce JC 1992. *Evolution's End: Claiming the Potential of Our Intelligence*, Harper: San Francisco, San Francisco.
- Peek, F. 1996 *The Real Rain Man*. Salt Lake City, Utah: Harkness Publishers

- Pring L 2005. Savant talent. *Developmental Medicine and Child Neurology* Vol. 47, pp.500–503.
- Ramachandran, V. S., & Blakeslee, S. 1998. *Phantoms In The Brain*. New York: William Morrow.
- Rush, B. 1789 Account Of A Wonderful Talent For Arithmetical Calculation In An African Slave, Living In Virginia. *American Music* Vol.5 pp. 62-63
- Rohan, S. 2010 What Is Savantism Retrieved from [autismsummer2010.providence.wikispaces.net/.../Savantism+Project+EDU+599.pdf](http://autismsummer2010.providence.wikispaces.net/.../Savantism+Project+EDU+599.pdf) on 11/12/2010
- Rayala, Martin 1981 On Nadia's Drawings: Theorizing about an Autistic Child's Phenomenal Ability *Studies in Art Education* Vol. 22 (2) pp. 70-72 Retrieved from <http://www.jstor.org/stable/1319837> on 8/1/2011
- Rimland, B. 1978 Savant Capabilities Of Autistic Children And Their Cognitive Implication. In *Cognitive Defects In The Development Of Mental Illness* (ed. G. Serban) pp. 43-65 New York, NY: Bruner-Mazel
- Sacks, O. 1985 The Twins *The New York Review of Books* 32, pp 16-20
- Sacks, O. 1985. *The Man Who Mistook His Wife For A Hat*. London: Duckworth.
- Sacks, O. 2007 *Musicophilia: Tales Of Music And The Brain*. New York, NY: Knopf Publishing Group
- Selze, L. 1977 *Nadia: A Case Of Extraordinary Drawing Ability In An Autistic Child*, London: Academic Press.
- Scripture, E. W. 1891 Arithmetical Prodigies. *American Journal of Psychology* Vol. 4 pp. 1-59
- Silberman, S. 2003 The Key To Genius *Wired Online Magazine*. [www.wired.com/wired/archiv/11/12/geniushtml](http://www.wired.com/wired/archiv/11/12/geniushtml) accessed on 15/10/2010
- Smith, N., & Tsimpli, I. M. 1995 *The Mind Of A Savant: Language Learning And Modularity* Oxford: Blackwell
- Smith, Tsimpli and Ouhalla 1993 Learning The Impossible: The Acquisition Of Possible And Impossible Languages By A Polyglot Savant *Lingua*, Vol. 91 pp.279-347
- Smith, N. & I. M. Tsimpli 1991 Linguistic Modularity? A Case Study Of A 'Savant' Linguist. *Lingua* Vol 84 (4) pp. 315-352
- Smith, N. V., Tsimpli, I., Morgan, G., Woll, B. 2010 *The signs of a savant*. Cambridge: Cambridge University Press. [Submitted] retrieved from [onlinelibrary.wiley.com/doi/10.1002/9780470775059.refs/pdf](http://onlinelibrary.wiley.com/doi/10.1002/9780470775059.refs/pdf) on 12/2/2011
- Snyder AW, Mitchell DJ 1999. Is Integer Arithmetic Fundamental To Mental Processing? The Mind's Secret Arithmetic. *Proceedings Of The Royal Society Of London Series B*. 266 (1419): pp. 587–592.
- Snyder AW, Mulcahy E, Taylor JL, Mitchell DJ, Sachdev P, Gandevia SC. 2003. Savant-Like Skills Exposed In Normal People By Suppressing The Left Fronto-Temporal Lobe. *Journal of Integrative Neuroscience*. Vol.2 (2) pp. 149–158.
- Snyder AW (2001) Paradox Of The Savant Mind. *Nature* Vol.413, pp.251–252.
- Snyder A. et al. 2004. Concept Formation: 'Object' Attributes Dynamically Inhibited From Conscious Awareness. *Journal of Integrative Neuroscience* Vol. 3 (1), pp. 31-46
- Snyder A 2009 Explaining And Inducing Savant Skills: Privileged Access To Lower Level, Less-Processed Information. *Philosophical Transactions of the Royal Society Biological Sciences* 364 (1522): 1399–1405.
- Snyder, A.W. 2006 Savant-Like Numerosity Skills Revealed In Normal People By Magnetic Pulses *Perception* Vol. 35 pp. 837-845
- Snyder, D.K. 1981 The Uncanny Abilities Of Idiot Savants. *TAT Journal* Vol 12 Retrieved from [TAT foundation.org/journal\\_archive.htm](http://TATfoundation.org/journal_archive.htm) on 10/12/2011
- Tao, B. 1999 Living with Exceptional children. In *Geniuses, Prodigies And Savants Workshop*. pp.25-33 Center Of The Mind. University of Sydney. Retrieved from [www.centreforthemind.com](http://www.centreforthemind.com) on 15/12/2010
- Tredgold, A.F. 1914 *Mental Deficiency* New York, NY: William Wood
- Tredgold, A.F. 1952 *Mental Deficiency* Baltimore, MD: Williams & Wilkins
- Tammet, D. 2009 *Embracing the Wide Sky: A Tour Across the Horizons of the Mind* London: Hodder & Stoughton.
- Tammet, D. 2006. *Born On A Blue Day*, London: Hodder & Stoughton.
- Thioux, M. 2006 The Day Of The Week When You Were Born In 700ms: Calendar Computation In An Autistic Savant *Journal Of Experimental Psychology* Vol 32(5) pp. 1155-1168.

- Treffert DA 2009 Savant Syndrome: An Extraordinary Condition. A Synopsis: Past, Present and Future *Philosophical Transactions of the Royal Society Biological Sciences* Vol. 346, pp. 1351-1357
- Treffert, Darold. No Date Henriett Seth F. - Rain Girl. Wisconsin Medical Society.
- Treffert, Darold A. and Gregory L. Wallace 2003. Islands of Genius *Scientific American, Inc Special Edition* Vol. 14(1) pp 76-85.
- Treffert, Darold A. and Gregory L. Wallace 2002. Living With Savant Syndrome. *Scientific American* Vol. 286 (6) pp. 76-85
- Treffert, Darold. No Date Tony DeBlois - A Prodigious Musical Savant. Wisconsin Medical Society.
- Treffert DA 2007 The Autistic Artist, "Special Faculties," and Savant Syndrome *Archives of Pediatrics & Adolescent Medicine*. Vol. 161(4)
- Treffert DA 2000. *Extraordinary People: Understanding Savant Syndrome*. New York, NY: Ballantine Books
- Treffert DA 1988. The Idiot Savant: A Review Of The Syndrome. *The American Journal Of Psychiatry* Vol. 145 (5): 563-572.
- Treffert DA, Christensen DD 2005. Inside The Mind Of A Savant. *Scientific American exclusive online issue* 293 (6): 108-113.
- Treffert, D. A. 1989 *Extraordinary People: Understanding 'idiot savants'* New York, NY: Harper & Row.
- Treffert DA. 1999 Savant Syndrome: Recent Research, Results and Resources. Wisconsin Medical Society.
- Treffert DA 2005 The Savant Syndrome In Autistic Disorder In *Recent Developments In Autism Research* (ed M.F. Casanova) pp. 27-55 New York, NY, Nova Science Publishers
- Treffert DA 2006b Dr. Down And Developmental Disorders *Journal Of Autism And Developmental Disorder* Vol. 36, pp. 965-966
- Treffert DA 2010 Asperger's Disorder And Savant Syndrome. Retrieved from Wisconsin Medical Society [www.wisconsinmedicalsociety.org/savant\\_syndrome/overview\\_of\\_savant\\_syndrome/synopsis](http://www.wisconsinmedicalsociety.org/savant_syndrome/overview_of_savant_syndrome/synopsis) on 8/11/2010
- Treffert DA 2000 *Extraordinary People*, Bantam Press, London.
- Tsimpli, I and Smith, N 1998 Modules And Quasi-Modules: Language The Theory Of Mind In A Polyglot Savant. *Learning & Individual Differences* Vol. 10(3 ) pp.193-215,
- Tsimpli, I and Smith, N 1996 Modules And Quasi-Modules: Language The Theory Of Mind In A Polyglot Savant. *UCL Working Papers in Linguistics* 8
- Tsimpli, I and Smith, N. 1991 Second-Language Learning: Evidence From A Polyglot Savant *UCL Working Papers in Linguistics* 3 pp 171-183
- Young, R. 1995 Savant Syndrome: Processes Underlying Extraordinary Abilities. Unpublished PhD thesis, University of Adelaide, Adelaide, South Australia
- Young, R. 1999 Unveiling The Savant Mind In *Geniuses, Prodigies And Savants Workshop*. pp. 9-12. Center Of The Mind. University of Sydney. Retrieved from [www.centreforthemind.com](http://www.centreforthemind.com) on 15/12/2010
- Young, R. 2001 Current Research In The Area Of Autism And Savant Syndrome. *International Education Journal* Vol 2 (40 pp. 392-433
- Young, R. et al. 2004 Switching Skills On By Turning Off Part Of The Brain *Neuroscience* Vol. 10 pp 215-222
- Young, R. & Nettelbeck, T. 1995 The Abilities Of A Musical Savant And His Family. *Journal Of Autism And Developmental Disorders* Vol. 25 pp. 229-245
- Warren, L. E. 1996 Idiot Savant *Plim Report online magazine*
- Welling, H. 1994. Prime Number Identification In 'Idiot Savants' Can They 'Calculate' Them *Journal Of Autism And Developmental Disorders*. pp. 199-207
- Wing, L. 1981. Asperger Syndrome: A Clinical Account *Psychological Medicine* Vol. 11, (1) pp. 115-130
- Winner, E. 2006 Uncommon Talents: Gifted Children, Prodigies And Savants *Scientific American exclusive online issue*
- Wisconsin Medical Society: Savant Syndrome  
[www.thesavantacademy.com](http://www.thesavantacademy.com) <http://www.savantacademy.org/>  
[http://www.wisconsinmedicalsociety.org/savant\\_syndrome/savant\\_articles/prodigy](http://www.wisconsinmedicalsociety.org/savant_syndrome/savant_articles/prodigy)  
<http://www.vaccinationnews.com/DailyNews/June2002/SavantSyndrome.htm> [www.wikipedia.org](http://www.wikipedia.org)
- Smith, N. Christopher And Language Acquisition, 4 parts Video on You tube. Author: newrationalsim <http://www.ofw-zone.com/ofwtube/linguistics/>