

A Review of: Exploring Giftedness and Autism, a study of differentiated educational program for autistic savants.

By Trevor Clark, National Director, Education and Research at Autism Spectrum Australia (ASPECT). Routledge: London. 2016.

Reviewed by Associate Professor David Dossetor

Introduction: Darold Treffert, an authority on savant syndrome and exceptional abilities sets the scene in the foreword: How is it possible for extraordinary ability and giftedness to co-exist with incapacitating disability in the same individual. The best known example is from the movie "Rain Man"? What does this say about dormant potential? How do islands of genius impact on our theories of overall intelligence? What brain changes account for the differences in Savants?

The focus of this book, which was based on Trevor Clark's PhD, is: Can these seemingly non functional traits be used in a strengths based approach to better communication, functional skills and independence? The book provides a specific Savant Skills Curriculum (SCC) in a control study to look at outcomes and then measures the strategies that improve the critical skills for life. Secondly he examines school-age students with autism who display savant skills with psychometric measures to standardise and document their skills. He documents their obsessive nature, their high levels of challenging behaviour as well as high levels of interest and motivation, using the Savant Skill Nomination Form and the Family and Teacher Savant Skill Questionnaires. He documents the early onset of skills without training and a familial link with superior performance of giftedness in family members. The students with savant skills show imaginative and creative skills, high-level memory and showed multiple savant skills rather than a single talent. These skills did not diminish with intervention. The challenge is to find them valued roles as adults and in employment.

Clark's PhD explored savant and splinter skills in the autistic population through a differentiated educational 'Savant Skill Curriculum' (SSC) over 2 years, using a multiple-replication case study research design in a group of 22 children aged 4-16. In the context of low IQ, the students with savant skills showed skills in: memory, hyperlexia (the ability to read, write and spell), art, music, mechanics, spatial skills, calendar and mathematical calculation, sensory sensitivity and athletic ability. This study continues to be a 'world first'. The study focuses on strengths rather than defi-

cits, and as such they should be seen as gifted students, not disabled children with freak talents. The book is rich with case stories. This study was done while studying at the Gifted Education Research, Resource and Information Centre at the University of NSW under Emeritus Professor Miraca Gross. For this study Clark was awarded the International Award for Excellence in Education and Psychology for the Gifted.

Bringing the challenge alive with case stories:

Patrick (14yrs) will not greet you with a hello but with what is your birthday or your car registration, etc and will recite these to you every time he sees you subsequently. He has loved numbers since he was 2 and can do 6 digit calculations faster than his teacher can on the calculator. He prefers to spell words than speak them. He is hyperlexic being able to decode words without necessarily knowing their meaning. He also loves computers and can use many software programs without training, such as removing his brother's files from the computer.

Bradley (6yrs) loves words and reads street directories, the telephone book and encyclopedias for leisure. He could read and write at 2 years. He constructs electronics with lego, making traffic lights, stereos and computers. He is 2 years ahead on reading and numbers, including number concepts.

Terry (5yrs) could recite 12 times table by 5 years, and knows the location of every street hole in Northern Sydney and draws complex marble mazes. His father is in finance, and grandfather and great grandfather are gifted in mathematics.

Yet all these three have autism. Patrick has mild Intellectual Disability (ID), while the others are of average IQ.

Challenging behaviours include: Patrick will bite himself or others, tantrums, running away from class, running through traffic with no road sense. His communication skills are delayed to the first centile, his social skills are delayed, he has low self esteem, and his behaviours are in the severely disturbed range.

“Innovative programs that focus on strengths are demonstrating some research results...”

Bradley easily stresses if a piece of Lego is missing, or if he has to change class, when he throws tantrums. He also is extremely anxious, crying, and demanding that routine be followed. Terry also tantrums, screams and refuses to cooperate and becomes aggressive if he doesn't get his own way. He is solitary but can cooperate with structured interactive games like snakes and ladders. He gets distressed and anxious if someone disagrees with his viewpoint.

Those with savant skills can be of any IQ, although it is rare in those with severe ID. Some are remarkable in contrast to their IQ (categorised as Talented Savants or Savant I) others are spectacular even in a normal IQ

(categorised as Prodigious Savants or Savants II).

Although Rimland found savant skills in 9.8% of children with autism, Howlin found about 30% of adults with autism had savant skills; yet in her study of 137, only 5 were in employment. 95% (of 81,000 people with autism) reported restrictions to their education in the 2014 Australian Bureau of Statistics survey. 86% reported school difficulties, 6% were not attending school at all and 81% had not completed a post school qualification. In the ASPECT 'We belong too' survey 65% of parents felt their child's teacher didn't understand autism and 70% felt their child's educational needs were not being met. There has also been a lack of autism educational research, with the available research emphasising early intervention. There can also be a gap between research and practice.

Innovative programs that focus on strengths are demonstrating some research results, such as in finding post school employment and quality of life. One student described was sensitive to noise and was found to have perfect pitch. He was introduced to making music on an Ipad, which he used for social engagement, and created songs for emotional regulation, and subsequently composed some top 10 popular songs

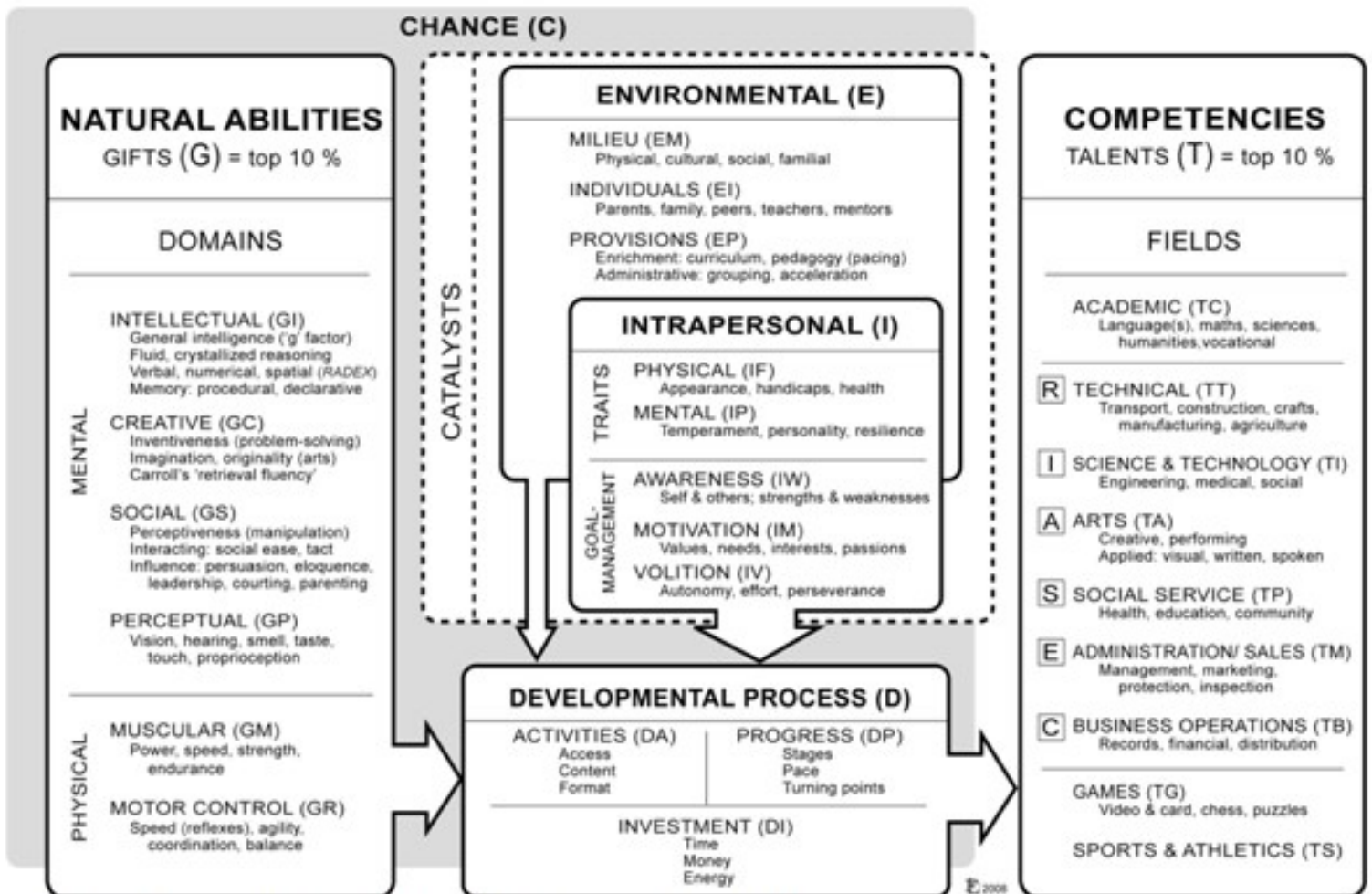


FIGURE 3.1 Gagne's Differential Model of Giftedness and Talent (2009)

Model for Savant Skill and Talent Development – Clark, 2011

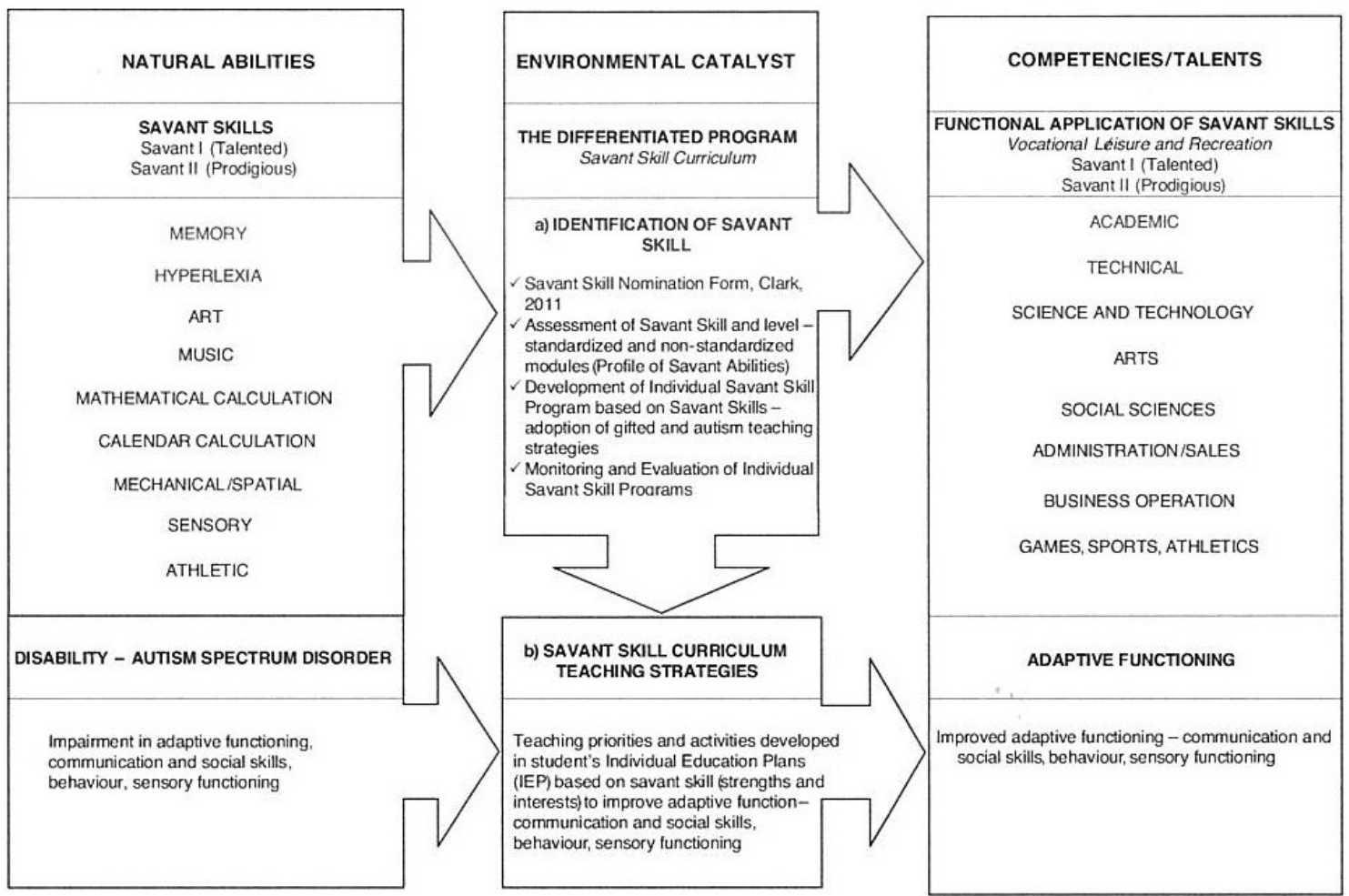


FIGURE 3.2 Model for Savant Skill and Talent Development – T.R. Clark, 2011

becoming a musical superstar. Using a special interest is the way to honour a child and motivate them to learn. One 24-year-old non verbal man with autism with special skills in Lego became an Ikea furniture assembler!

The SSC underpins practice with research, draws on the skills of autism education combined with that for the gifted, and suggests that *identifying savant skills may transform their education.*

Patrick was impossible to engage in class as he ran around flicking through books and magazines and running away. Clark provides clinical scenarios of a further 3 students to scaffold the account of the intervention. Their challenging behaviour was partly due to frustration and boredom in the absence of education of their gifted skills. While savant skills are frequently observed to be self taught, they are also dismissed as the product of relentless practice and overlearning.

Clark's research review suggests there are a discrete number of savant skills: memory generally for narrow

fields of interest; hyperlexia or pseudo-verbal skills with limited understanding; artistic ability mainly drawing or painting; musical ability for singing or an instrument; mechanical/visual spatial ability for taking apart or assembling mechanical objects, or maps; calendar calculation; mathematical calculation; athletic or coordination ability, e.g. balance (walking on the top of fences); and some include hyper or hypo sensitivity, but this may be a failure in sensory processing (this can include knowing the time without a watch, or hearing a conversation others can't hear). Young people with autism may have a talent for systemising, which requires an attention to detail. All these features were found in the study, the most frequent being: memory (100%), hyperlexia (87%), mechanical/spatial (81%), calendrical (25%), number (18.25%) and athletic (6.25%). Over 50% had sensory abilities. Patrick had the most skills at 7 years old and the details of all are provided. Some still argue that savant skills are independent of IQ. Testing these skills on psychometric measures is described: it has been suggested that those with savant skills do no better than expected for IQ. For example in memory, their memory skills have

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been described as similar to artificial intelligence, not geared to everyday problem solving, and they may have these skills at the expense of efficiently accessible and coherent memories. This proved to be incorrect. In this cohort they all had superior memory skills on memory testing. Treffert's book 'The complexity of Greatness' (2013) it is argued that innate talent is linked to genes for memory and that neuroscientists have discovered neurones that make connections independent of experience, indicating genetics underlie such skills. There is also genetic evidence of domain specific gifts in non-disabled populations e.g. in absolute pitch. However, the research evidence also shows that rehearsal and practice also contribute. All of the subjects spent hours on their interest each day. Conversely these skills can be lost if not supported. There is also a relationship between restricted interest and motivation for practice. Weak central coherence and problems with abstraction/perspective as a deficit of executive function appears to be part of the picture. There remains dispute on savants' creativity which may be related to IQ, yet some certainly achieve originality, for example in music. Treffert suggests savant skills involve pathological events forming exceptional neuronal structures in prenatal brain development, and this rewiring is associated with restrictive thought processes and reduced abstract thinking. He backs this with EEGs, brain scans and neuropsychological testing and has found a number of cases with right hemisphere imbalance. Functional brain imaging suggests increased recruitment of memory areas. Savant skills in ID tend to be seen as curiosities, but Clark's aim is to make this skills of functional value through developing the Savant Skill Curriculum. Some of the savant success stories are well worth reading on their own.

The SCC is a framework to merge the fields of giftedness and autism education. Clark works from the Gagne differentiated mode of giftedness and talent and developed a modified Model for Savant skill and Talent Development (see figures above).

The SCC is planned as an **E**nvironmental catalyst involving key **I**ndividuals (EI) (parents, teachers and

mentors) and **P**rovisions (EP), enhancing **I**nterpersonal **M**otivation (IM) using Autism education skills. The natural abilities are considered against other skills (Savant I) and the Developmental Process has a strong emphasis in transferring gifts into talents for these disabled students. This includes an emphasis on improved adaptive function: communication, social skills and behaviour, which in turns improves competencies and talents. *Acceleration, enrichment and mentorships* were borrowed from gifted student teaching. Lastly **1 to 1 mentors** were incorporated. There was also a focus on integration into mainstream classes. A longitudinal multiple-replication case study design was used which is a powerful method for rare phenomena. Various standardised and non-standardised measures before and after along with



qualitative information. The study measured: functional application of savant skill, communication ability, social skills and behaviour, academic self-esteem, and degree of Autism. Follow up was at 12 months and a waitlist control group of 6 was also included as a comparison.

Results of Clark's research included the finding that all child participants were highly motivated in working on savant skills. These skills develop from an early age between 6 months and 2 years. They had not received previous specific training. 72% had giftedness in family members. This confirmed they are 'twice-exceptional' in giftedness and autism. All participants showed special memory skills but didn't necessarily perform well on formal memory testing. This does suggest that memory may be a contributor to other savant skills.

There was a substantial improvement in the functional use of savant skills compared to controls enabling productive talents for many children, which was attributable to the design of the SCC. Communication skills improved more in the control group, which may reflect the focus of the curriculum in the control group. There was a lack of significant change in behavioural/emotional disturbance, or self-esteem although there were improvements in both. There was definite reduction in the degree of autism which seem to reflect changes in adaptive communication, behaviour and social skills. Some showed a decline in their savant skills, e.g. improved comprehension was associated with a decline in hyperlexia. Temple Grandin, an adult savant with autism, has suggested that savant skills decline with improved social development. This change may reflect a reduction in the obsessive nature of a savant skill, not a decline in the skill itself. Overall the SCC led to a decline of the deficits of these savants.

Clark's book also provides a 'how to' on how to assess a child for savant skills, how to develop the SCC for a child and then how to evaluate the changes at one year.

Changes in the example cases are described following SCC implementation: Patrick can now use the computer independently and writes the school newsletter. He showed improvement in communication and behaviour and an increased interest in social relations. Bradley had peers who were interested in his electronics and won popularity and self-esteem and an improvement in social language. He also helps the school caretaker with the school electrical systems. They both have a decline in autistic behaviours. Terry also remains with savant skills. He uses his spatial skills to

“Intellectual skills that can be developed and harnessed to reduce other areas of functional disability...”

help his mother navigate in the car. He has gained some appropriate computer skills. More improvements are generally found in practical accounts than necessarily reflected on some of the objective tests. Clark suggests that children with autism need to time to think about their special interests and one girl with autism expressed that teachers need to include them in the design and implementation of educational programs. One example was a teacher designing an examination on classroom air conditioners, which of course the relevant girl with autism won, with consequent enhancement of self-esteem.

In conclusion, these are not just 'freak talents' but intellectual skills that can be developed and harnessed to reduce other areas of functional disability. The Australian Advisory Board on Autism Spectrum Disorders position paper (2012) has two governing principles. Every child with Autism should have access to an educational service appropriate to their needs; and all educational sectors should provide services to cater for the needs of Autism. The SCC is therefore an appropriate intervention for all such 'twice exceptional' students.

As this study remains a first, there is still a need for replication, and further research on the nature of savants and giftedness, for example is the importance of IQ and communication skills. Finally, we need to examine the role of such specialised curricula for post school options that prepare for transition to adulthood and employment.

This text is enhanced by the personalised elements of the account, from the case studies, the Clark's learning experience, and the influence of his supervisor and mentors. Clark also testifies to the dedication of the parents and teachers involved. His accounts of the long term follow up of some of his students illustrates the long term benefits of the increased functionality of savants' skills to both the young men in their 20s and 30s and indeed their families. The book includes useful a range of useful resources to enable others to ap-



proach the 'how to' for themselves.

I found the text the best summary on this interesting subject of autistic savants that all those who work with autism encounter. It illustrates the importance of developing educational research for young people with disabilities. I also think that studying savants and their education may become increasingly important, as authors like Tanzi and Chopra suggests, growing intelligences and skills, and improving our capacity for using our brains, is key to the development of our species (Superbrain, 2012).

Further Reading

Rudolph Tanzi, Deepak Chopra. 2012. Super Brain: Unleashing the Explosive Power of Your Mind to Maximize Health, Happiness, and Spiritual Well-Being.