

The outstanding abilities of those with savant syndrome

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Look at each one of these numbers once, how many numbers can you remember from the sequence, 5, 10 maybe all 19, but how about reciting 22, 514 numbers. This almost impossible feat was done by Daniel Tammet, an autistic savant and this amazing feat of memory is something that many savants share. In Oliver Sacks "The Man Who Mistook His Wife For a Hat" Dr. Sacks recalls many stories of his savant patients accomplishing amazing tasks with little to no practice, whether it be musical, artistic or numerical talents they all leave Dr. Sacks amazed and interested about how these talents were achieved. How could someone with seemingly no practice in a field excel beyond any of their peers and how are these patients able to break the typical idea of human learning is something that must be understood to truly deepen humanities knowledge of the brain.

Savant syndrome is described as a rare condition in which persons with developmental disabilities, including but not limited to autism, or other CNS (Central Nervous System) disorders or disease have some spectacular 'islands of genius' that stand in jarring juxtaposition to overall limitations (Treffert, 2010). These "spectacular 'islands of genius'" can be seen in many of Dr. Sacks patients, for example in the story "the twins" he writes about how two extremely autistic twin brothers who are incapable of reading or doing basic multiplication are able to determine what day of the week it will be on a date in last or next 40, 000 years, they are able to memorize numbers up to 300 with ease and are able to figure out nine digit prime numbers within seconds.

This is just one of the many examples of the ability of Savants, although the “the twins” display great numerical ability savant abilities come in multiple varieties, for example musical savants, some musical savants are able to play intricate piano pieces although only hearing it once, similarly artistic savants are able to recreate images only seen once with extreme detail and accuracy. To first understand how savants are able to accomplish these impressive feats, a basic understanding of the brain of a savant must be understood. Savants will always have some sort of injury to their brains left hemisphere and because of this there is a recruitment of still available cortical tissue elsewhere in the brain that compensates for this loss, this allows for increased development in the right brain hemisphere. Proof of this left-brain damage right-brain compensation hypothesis, is shown in Research done by Dr. Allan Snyder who has shown that using low-frequency magnetic pulses to suppress the left frontal temporal lobe allows an increase in savant like abilities (eg: proofreading ability, artistic ability) in the test subjects. Furthermore research done by Dr. Bruce Miller who has documented that elderly patient with frontotemporal dementia, specifically with degeneration on frontal and anterior temporal lobes on the left side of the brain expressed an increase in musical and artistic abilities.

Understanding how the brain of a Savant functions we can see how this change in anatomy affects how they learn and retain information. Learning has been discussed by Professor Davies multiple times, one specific type of learning he mentioned, Observational Learning, is a good starting point in understanding how savants learn. Observational learning explained by

Professor Davies is learning that happens by observing another individual do something, savants do observe (or listen to) things around them, but many savants aren't explicitly trying to learn about the things they experience rather through prolonged exposure to a certain thing savants are able to implicitly learn about it due to their unique brain anatomy. Proof of this idea is shown in "The Man Who Mistook His Wife For a Hat" in the story "A Walking Grove" where his patient Martin. A, who suffered from mental retardation (Martin's left brain hemisphere was also injured due to birth complications), was able to memorize 2,000 operas and the complete map of New York, what is also mentioned about Martin. A is that his father was renowned musician in New York, the city he was raised in. And this idea of prolonged exposure and savant abilities is also shared by Jose in "The Autist Artist" who's close family contains multiple artists which explains why he was able to attain such great artistic skills seemingly out of nowhere.

Great implicit learning skills aren't savants only unique ability their prodigious memory allows for them to be able to retain the implicit knowledge they have. The certain type of memory that seems to be heightened in all savants is implicit memory, implicit memory is described by Professor Davies as being made of knowledge based on previous experiences in skills that are performed automatically once we have mastered them, implicit knowledge resides outside of our conscious awareness and the example Professor Davies gives to the class of how we cannot explain how we walk is very similar to how savants aren't able to explain their own abilities. Savants merely memorize anything that you put

around them and with long enough exposure they are able to see patterns, understand and break down concepts to allow for them recreate these actions without seemingly ever having to practice and all this is done unconsciously.