

## Autism as an Intellectual Lens

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Received Date: June 17, 2020; Accepted Date: June 22, 2020; Published Date: July 01, 2020

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### Abstract

There is an inherent neurophysiological difference in how the autistic brain processes information. We who are autistic live in a specialized inner world that is entirely intellectual, free from emotional and social distractions.

### Introduction

Autism, from the Greek word meaning *self*, was coined in 1911 by Swiss psychiatrist, Eugen Bleuler, who used it to describe withdrawal into one's inner world [1]. Autistic children appear to be in a world of their own, isolated and alone, with senses that can overload easily. There is a recently coined word for autism in the Maori language: "takiwātanga". It means "in his/her own space" [2].

In 1943, psychiatrist Leo Kanner studied the case histories of 11 highly intelligent children who shared a common set of symptoms consistent with autism: the need for solitude, the need for sameness, to be alone in a world that never varied [3].

In 1944, medical professor Hans Asperger studied four boys whom he considered autistic because of their shutting off relations between self and the outside world [4]. Asperger described these boys as having an autistic personality that is an "extreme variant of male intelligence" [5]. He felt that their severe difficulties with social integration were compensated for by the kind of high level of thought and experience that can lead to exceptional achievements in later life.

From intimate knowledge of my own autistic brain, I can say with certainty that autism is not a withdrawal. It is simply a specialized way of being in the world. We who are autistic study the world in great scholarly detail, but without feeling any emotional attachment to what we see. We are simply living in our own intellectual space.

### Neurophysiology of the Autistic Brain

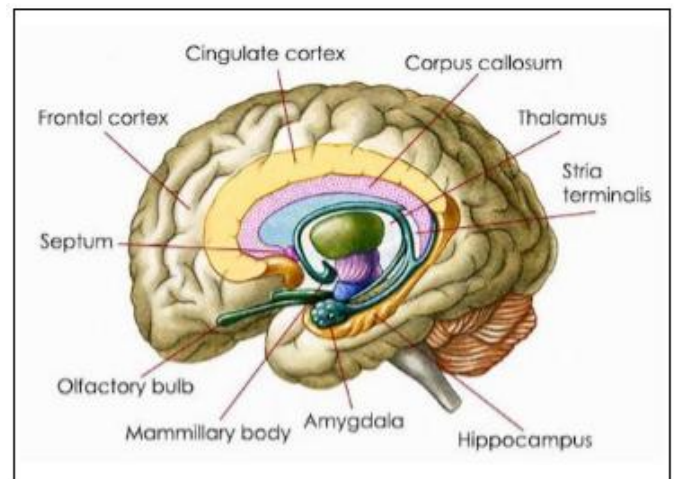


Figure 1: image credit: nutritionreview.org

The neurological structure of the autistic brain is the same as for any other brain. What differs about the autistic brain is how it functions with respect to its neurophysiology (Table 1).

|                                  |               |   |
|----------------------------------|---------------|---|
| <b>Cingulate Cortex/Gyrus</b>    | Dysfunctional | The cingulate gyrus (CG) is that part of the brain which focuses attention. In autism, the CG appears to keep the person’s attention trapped in the left frontal lobe, creating a perpetual state of hyper focus.   |
| <b>Left Frontal Cortex/Lobe</b>  | Dysregulated  | In the autistic left frontal lobe, alpha frequencies (8-12 Hz) predominate over beta (12.5-30 Hz), which is the exact opposite of the neurotypical brain. Higher alpha frequencies in the left brain appear to be compensating for the inability to access creativity and intuition from the right brain. |
| <b>Right Frontal Cortex/Lobe</b> | Inaccessible  | There is normal brainwave activity in the right frontal lobe, with alpha frequencies predominating over beta frequencies. However, the autistic person is completely unaware of anything that happens in his/her right frontal lobe, the place where emotions and social connectivity are experienced.    |
| <b>Amygdala</b>                  | Inactive      | The amygdala plays a central role in the expressing of emotions, especially fear. A dysfunctional CG prevents the autistic person from feeling any emotion, with the result that the amygdala is virtually non-functioning. An autistic person typically never experiences fear.                          |

**Table 1:** Autistic Neurophysiology.

In a neurotypical brain, the cingulate gyrus (CG) acts like an automatic transmission that seamlessly switches attention back and forth between frontal lobes, as required. In autism, however, a dysfunctional CG keeps the person trapped in his/her left frontal lobe, the intellectual, analytical, problem-solving part of the brain – with no ability to access the emotional/creative right frontal lobe, which plays a central role in spontaneity, social behavior, and nonverbal abilities. Some neurotypical people are left-brain dominant whereas others are right brain dominant. Autistic people, however, are left brain exclusive. They always speak factually, with no trace of emotion, and a deadpan facial expression.

Being left brain exclusive means that one can only process his/her emotions intellectually, by deduction or inference, a process that can take about 24 hours. Failure to process emotions causes anxiety, which is an upsetting physiological response (different from emotion) that bypasses the intellect.

Dysfunction of the CG is the probable cause of hyperfocus, the perpetual state of intense single-minded concentration fixated on one thought pattern at a time, to the exclusion of everything else [6, 7]. Hyperfocus is so intensely single-minded that an autistic person cannot divide attention between two trains of thought. An autistic person takes everything you say literally because s/he cannot also be running a second mental program questioning how you use words. While talking at length about a favorite topic, autistic people are incapable of

running a second mental program asking how they are being received or perceived by their audience. Autistic people require structured activities because they cannot divide their attention between what they are doing and trying to figure out what may be about to happen next.

Hyperfocus also causes various kinds of sensory overload. A sudden loud or high-pitched noise switches hyper focus to the noise, which the autistic person then experiences with many times the intensity than does a neurotypical person. Seeing too many words on a page can cause cognitive impairment whereby the autistic person’s mind goes disturbingly blank. Too many products on shelves and overhearing unwanted conversations in stores can trigger anxiety. Lighting displays in hardware stores can trigger intense anxiety. For some, hyperfocus exaggerates the sense of touch, making close fitting clothing irritating and hugs unbearable.

**Autistic Hyperfocus**

Hyperfocus is the unique and defining characteristic of autism that is responsible for all 52 of its observed traits, 22 of which are listed below. Hyperfocus is the perpetual and unrelenting state of intense single-minded concentration fixated on one thought pattern at a time, to the exclusion of everything else [6, 7] (Table 2).

|                         |  |
|-------------------------|--|
| <b>Mental Traits</b>    | <ul style="list-style-type: none"> <li>• Intense single-mindedness</li> <li>• Trapped in thoughts</li> <li>• Always engaged in mental activity</li> <li>• Passionately pursues interests, often to extremes</li> <li>• Amasses encyclopedic knowledge about areas of interest</li> <li>• Spontaneity not possible, activities must be pre-planned</li> <li>• Consistent to daily routines, agitated if routine is disrupted</li> </ul> |
| <b>Emotional Traits</b> | <ul style="list-style-type: none"> <li>• Unable to feel emotion</li> <li>• Processes emotions intellectually</li> <li>• Incapable of experiencing fear</li> <li>• Never (or rarely) cries or laughs</li> </ul>   |

|                        |  |
|------------------------|--|
|                        | <ul style="list-style-type: none"> <li>• Shrinks from emotional displays by others</li> <li>• Unable to defend against emotional attacks</li> </ul>  |
| <b>Social Traits</b>   | <ul style="list-style-type: none"> <li>• Lacks innate motivation to socialize</li> <li>• Unaware of feelings, needs, and interests of others</li> <li>• No awareness of how perceived by others</li> <li>• Unaware of socially appropriate responses</li> <li>• Misses subtleties, unable to take hints</li> </ul> |
| <b>In Conversation</b> | <ul style="list-style-type: none"> <li>• Innate forthrightness tends to scare others</li> <li>• Speaks factually with no trace of emotion</li> <li>• Takes everything literally</li> <li>• Prefers monologue to dialogue</li> </ul>  |

**Table 2:** 22 Autistic Traits Caused by Hyperfocus.

### Autism in History

Examination of the personal lives of the following historical figures indicates that these men functioned with autistic hyperfocus: Thomas Jefferson (1749-1826), Charles Darwin (1809-1882), Thomas Edison (1847-1931), Nikola Tesla (1856-1943), and Albert Einstein (1879-1955). Most geniuses are not autistic. Neither are most autistic people geniuses. However, autism tends to increase one’s IQ much higher than it would have been if the person had been born with a neurotypical brain. This is because the autistic person spends every waking moment in a virtual intellectual laboratory free from emotional and social distractions.

### Autism in Fiction

The fictional detective, Sherlock Holmes, displayed most of the above characteristics of autistic hyperfocus, especially including (a) astute powers of observation, (b) brilliant at deductive reasoning, (c) phenomenal memory for details, (d) unemotional when speaking, (e) asocial, and (f) delivered monologues. Sherlock also played the violin – as did Jefferson, Edison, and Einstein. Playing a musical instrument enables autistic people to bypass the intellect to feel emotion directly.

In 2004, the creator of the medical drama “House” starring actor Hugh Laurie, described it as “a subtle homage to Sherlock Holmes” [8]. The setting for this TV series thus takes the character back to its medical roots.

Arthur Conan Doyle explicitly modelled his Sherlock Holmes character after autistic medical professor Joseph Bell (1837-1911) [8]. Bell was the first Scottish scientific surgeon and a pioneer in forensic pathology. Bell had astute powers of

observation, which he loved to display by picking a stranger at random and deducing his previous history, habits, nationality, occupation, and recent travels, based on observation alone.

### Conclusion

We who are autistic view the world and everything in it as if through an intellectual lens. Our specialized brains enable us to acquire encyclopedic knowledge about whatever topics are of interest to us. Every day we passionately pursue new thoughts and ideas.

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**Citation:** Rowland D (2020) *Autism as an Intellectual Lens*. *Jr Neuro Psycho and Brain Res: JNPBR-142*.