

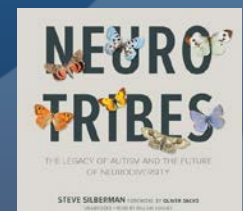
# Neurodiversity

## 10<sup>th</sup> Annual Nurturing Developing Minds Conference

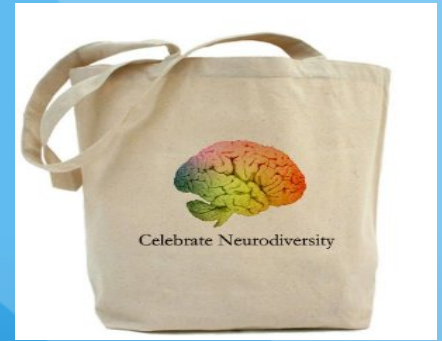
Manuel F. Casanova, M.D.  
SmartState Endowed Chair in Childhood Neurotherapeutics  
University of South Carolina  
Greenville Health System

# Conflict of Interests

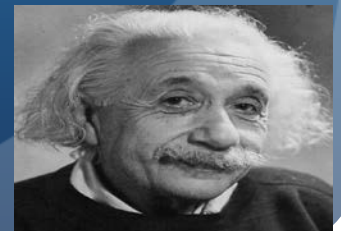
- Neuronetics (TMS platform), Neuronetrix Incorporated, Clearly Present Foundation
- Pfizer, Eisai, Nycomed Amersham, Aventis Pasteur Limited, Medvantis Medical Service
- Council of Health Care Advisors for the Gerson Lehrman Group
- Royalties: Springer, Nova, Taylor and Francis, John Wiley
- I am a physician who deals with individuals with neurodevelopmental disabilities and have a grandson with autism.



# Neurodiversity



- "A new wave of activists wants to celebrate atypical brain function as a positive identity, not a disability." New York News and Politics
- "...neurological (brain wiring) differences, traditionally seen as disadvantages, are really advantages." Fox and Hounds
- "What is autism: a devastating developmental disorder, a lifelong disability, or a naturally occurring form of cognitive difference akin to certain forms of genius?" SUPOZA.COM



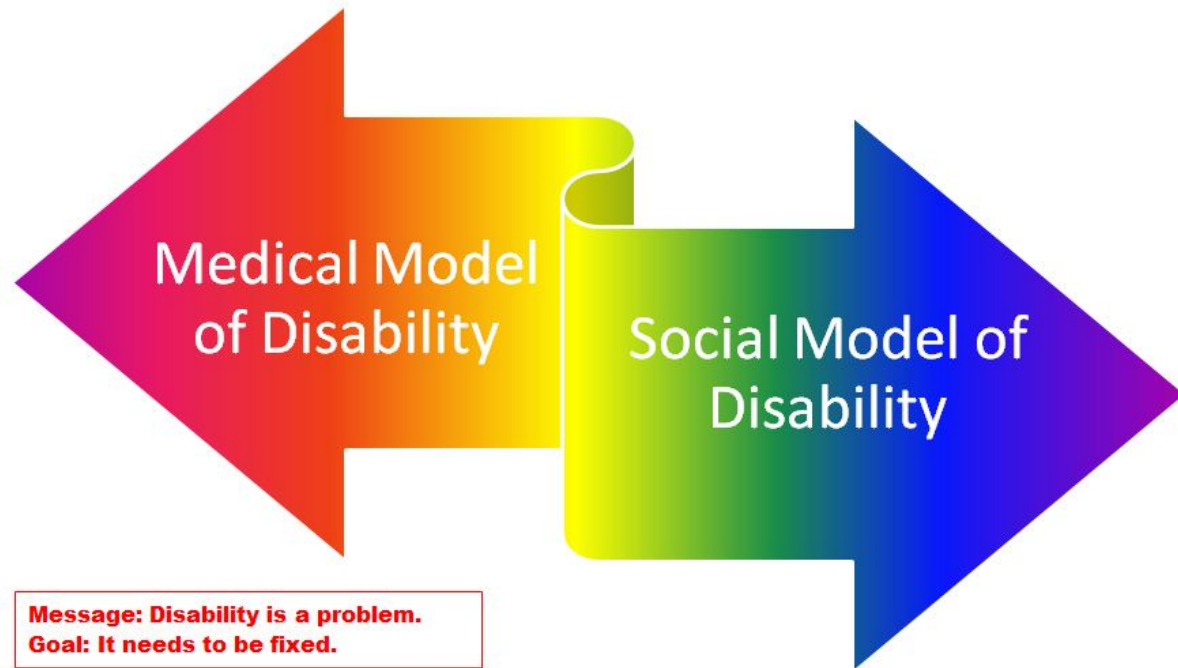
# NEURODIVERSITY AND AUTISTIC PRIDE



Individual with autism vs. Autistic Individual  
Control subject vs. Typically developing(TD)  
subject

# What message are you sending???

“Why is it that what makes me *me*, needs to be classified as a disability?”



**Message: Disability is a problem.**  
**Goal: It needs to be fixed.**

**Message: Disability is a natural form of diversity.**  
**Goal: Accommodate disability, with optimal outcomes.**

A child under 18 will be considered disabled if he or she has a medically determinable physical or mental impairment or combination of impairments that cause marked and severe functional limitations, that can be expected to cause death or that has lasted or can be expected to last for a continuous period of not less than 12 months.

Normal variation in the human genome



A social category rather than a medical disorder

Includes autism, bipolar disorders, and other neurotypes

It does not need to be cured

ABA is specially pernicious.

## Neurodiversity

**Neurodiversity** is an approach to **learning** and **disability** that suggests that diverse **neurological conditions** appear as a result of normal **variations in the human genome**.<sup>[1]</sup> This **neologism** originates in the late 1990s as a challenge to prevailing views of neurological diversity as inherently pathological, instead asserting that neurological differences should be recognized and respected as a social category on a par with **gender**, **ethnicity**, **sexual orientation**, or disability status.

There is a neurodiversity movement, which is an international civil rights movement that has the **autism rights movement** as its most influential submovement. This movement frames **autism**, **bipolar disorder** and other neurotypes as a natural human variation rather than a pathology or disorder, and its advocates reject the idea that neurological differences need to be (or can be) cured, as they believe them to be authentic forms of human diversity, self-expression, and being.

Neurodiversity advocates promote support systems (such as inclusion-focused services, accommodations, communication and assistive technologies, occupational training, and independent living support)<sup>[2]</sup> that allow those who are neurologically diverse to live their lives as they are, rather than being coerced or forced to adopt uncritically accepted ideas of normalcy, or to conform to a clinical ideal.<sup>[3]</sup>

Español



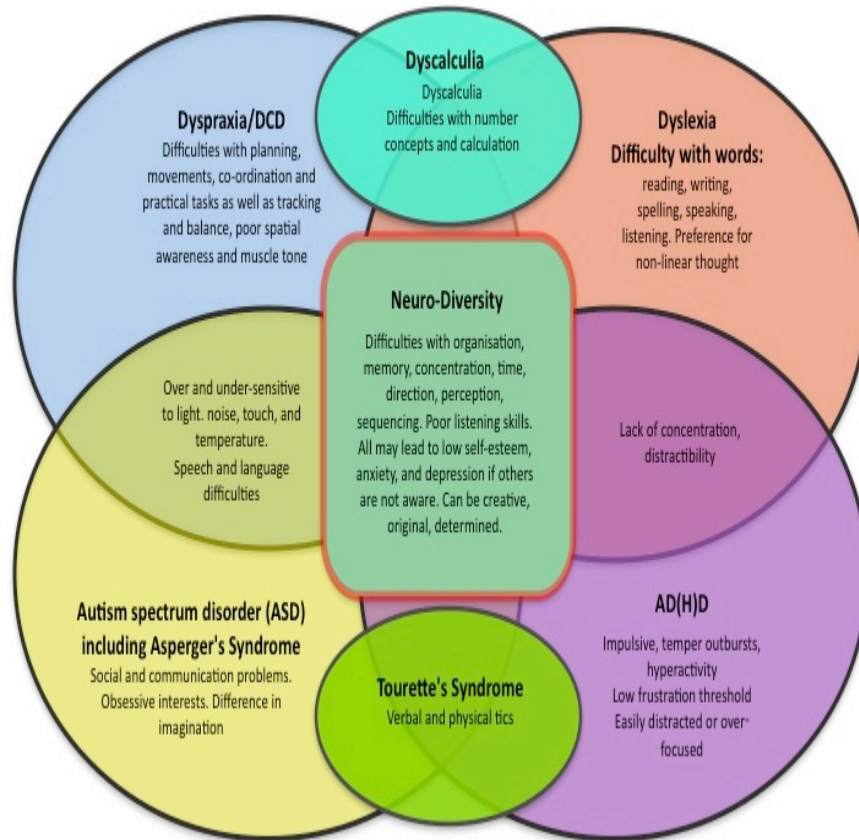
The rainbow-colored **infinity** symbol represents the diversity of the autism spectrum as well as the greater neurodiversity movement.

Nick Walker argued in 2012 that there is no such thing as a "neurodiverse individual", because the concept of neurodiversity encompasses all people of every neurological status, and that all people are neurodiverse. Walker instead proposes the term neurominority as "a good, non-pathologizing word for referring to all people who aren't neurotypical".



## The Make-up of Neuro-Diversity

This is a document for discussion, concentrating mainly on the difficulties of those with neuro-diversity. It must however be pointed out that many such people are excellent at maths, co-ordination, reading etc. We are people of extremes.

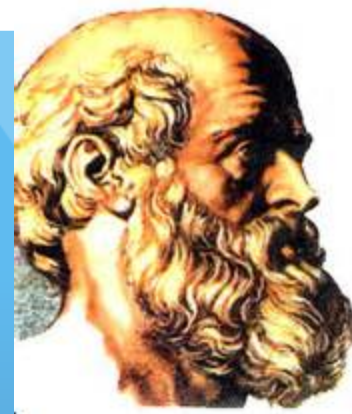


Created by Mary Colley

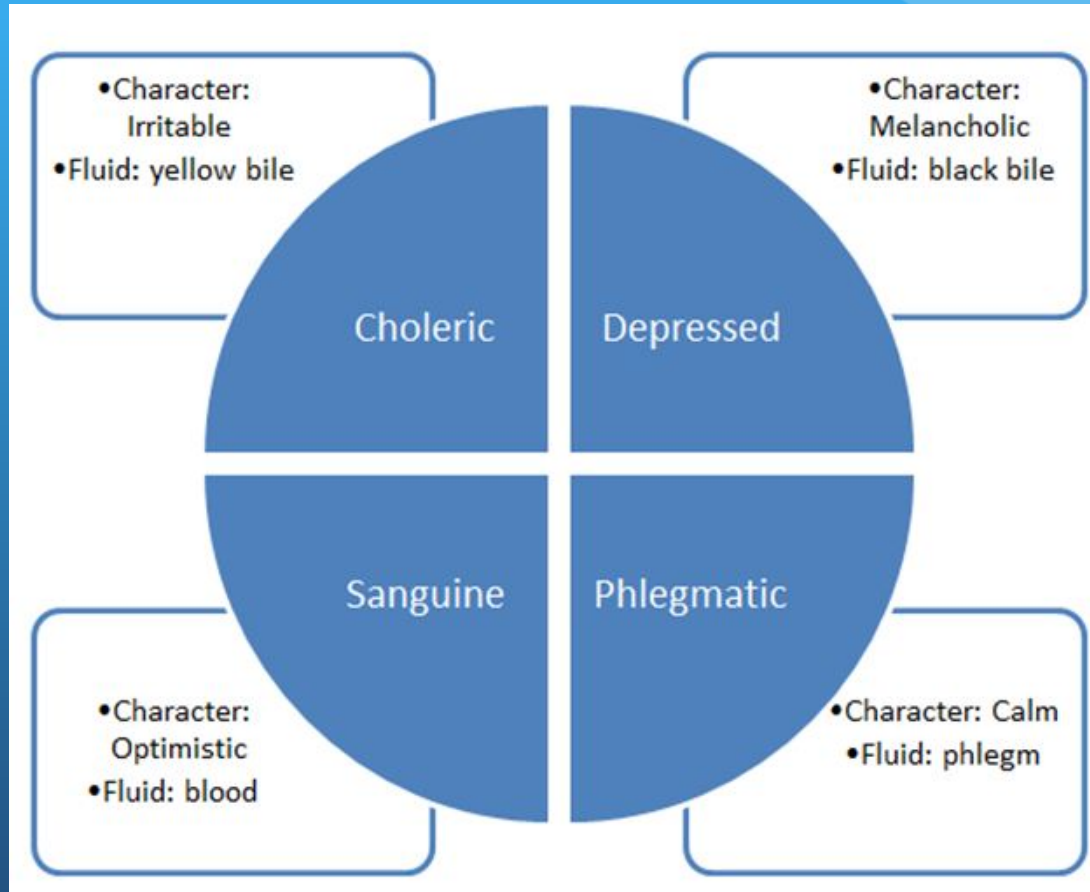


Evolutionary history: “(Neuro)diversity is not only what makes us beautiful, as a species, but it is what has helped us survive and advance” . <http://www.neurodiversity.com/neurodiversity.html>

# Hippocrates' Four Personality Types



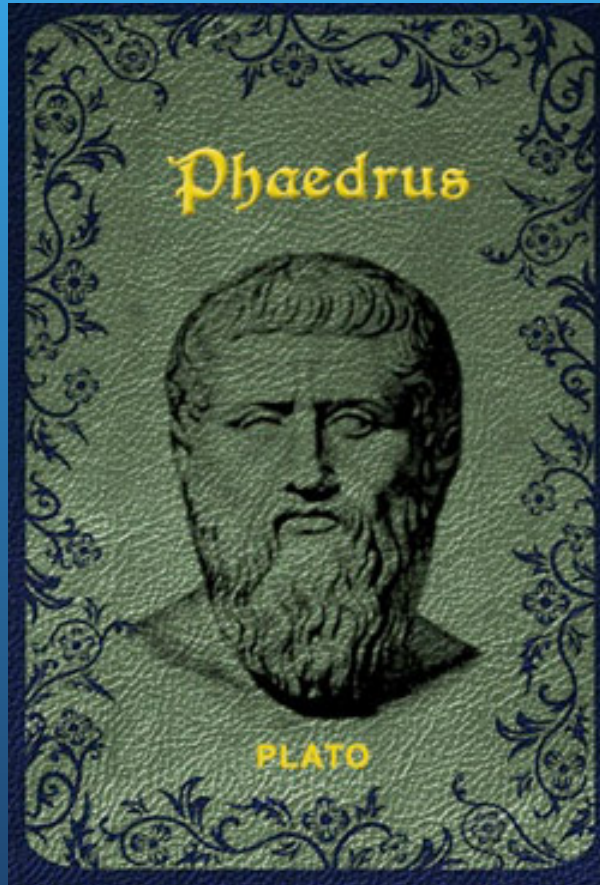
(c. 460-370 BC)



Hippocrates was a well-known Greek doctor who, in addition to being the father of the Hippocratic Oath, identified four personality temperaments displayed by people. Each temperament has its share of positive and negative traits that can either prosper or hinder a person in professional or personal situations. It is rare for a person to fit solely within one of the temperaments. While any given temperament may be dominant in a person, most individuals demonstrate characteristics of more than one temperament.



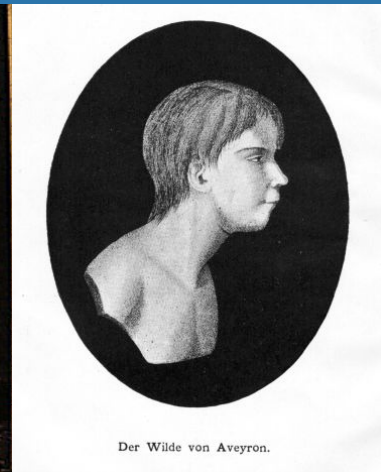
“...there is also a madness which is a divine gift, and the source of the “chiefest” blessings granted to men.” Socrates

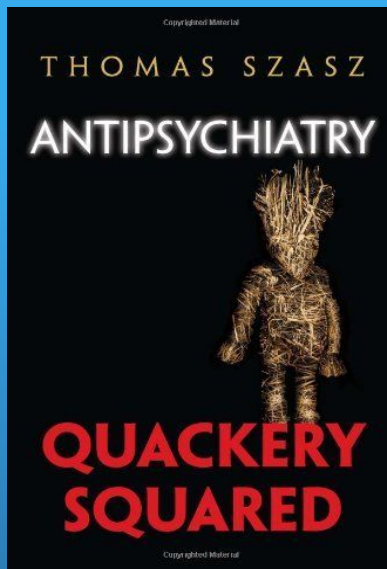


In this dialogue Socrates states that in defining madness we should “carve nature at the joints” and make a distinction between what comes from a biological disorder and what is a departure from conventions of conduct with a special emphasis on “divine madness”.

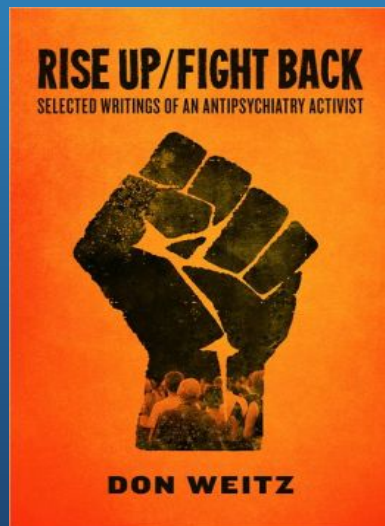
# Holy Madness

- “For some romantics, compassionate understanding could be elevated into something approaching respect or even envy. The insane, they believed, had found a way of getting back to a Rousseauian state of nature by liberating themselves from a repressive civilization that dictated normality” (Blanning, 2011).





Szasz claimed that mental illnesses were not real in the sense that cancer was objectively real. According to Szasz psychiatry deals with dogmatic assertions rather than scientific tenets. Psychiatrists from around the world joined in this criticism including Giorgio Antonucci, R.D. Laing, Franco Basaglia and Theodore Lidz.



## Mental Patients



## Unite!

End psychiatric oppression. Expose the false "expertise" of psychiatry. Guarantee liberty to all law-abiding Americans. Stop psychiatric assault, including forced administration of psychiatric drugs & electroshock. Stop kangaroo court commitment hearings: Create a right to jury trial in civil commitment, which exists in 19 states & District of Columbia—but not North Carolina. Make people aware of the brain damage caused by electric shock treatment & psychiatric drugs, including popular new antidepressants (SSRIs).

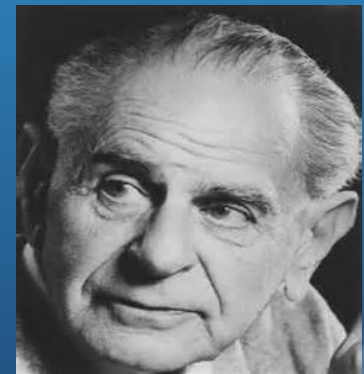
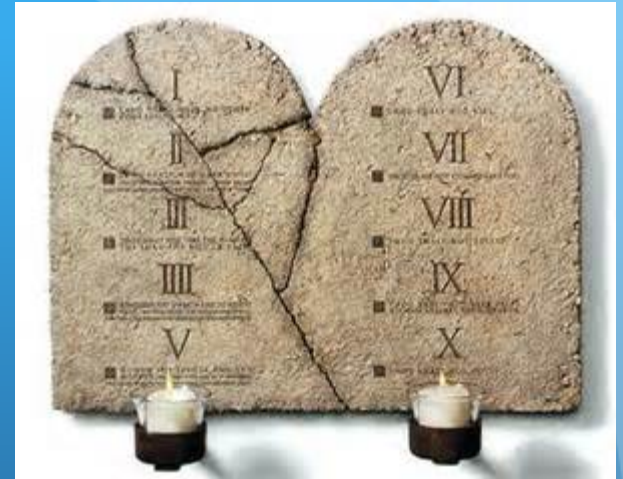
Learn more at our web site:

**WWW.ANTIPSYCHIATRY.ORG**

If you don't have Internet access, go to a public library.

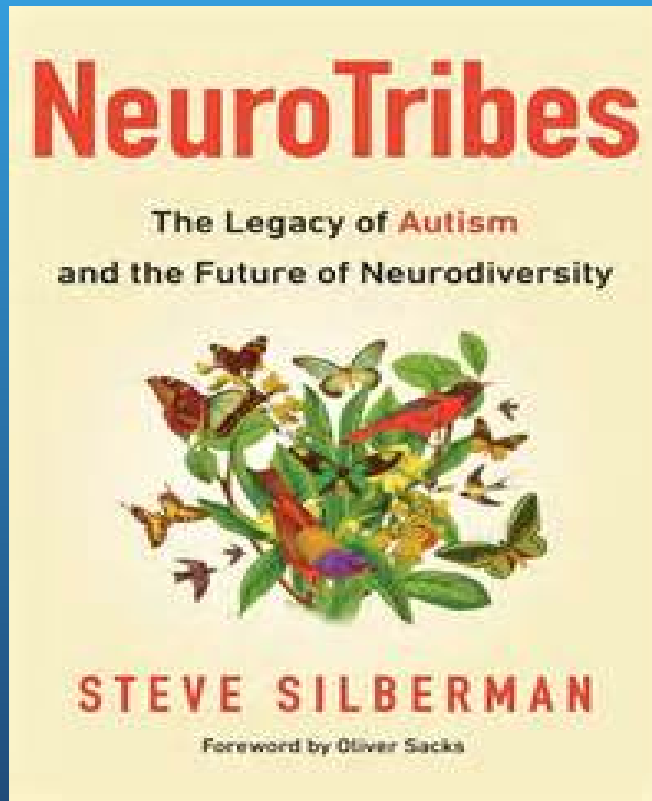
# Neurodiversity: Science vs. Dogma

- Dogma is a principle or set of principles laid down by an authority as incontrovertibly true. It serves as part of the primary basis of an ideology or belief system, and it cannot be changed or discarded without affecting the very system's paradigm, or the ideology itself.



Karl Popper  
(1902-1994)





"Revealing the untold story of the father of Asperger's syndrome, a landmark book reveals the secret history of autism..."

"Neurotribes' examines the history- and the myths- of the autism spectrum."



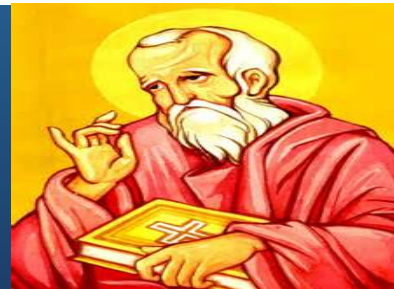


**KANNER**

**vs**



**ASPERGER**

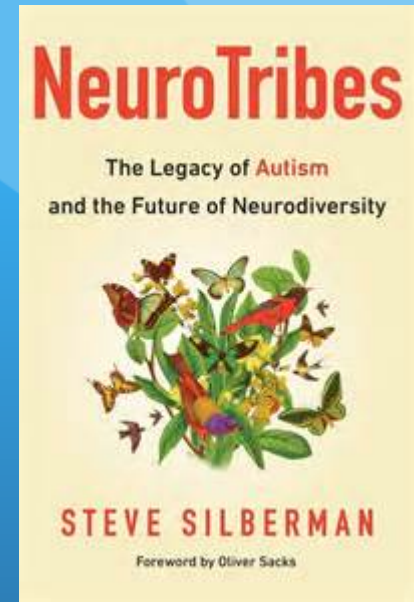


# Hans Asperger founder of Neurodiversity

- Among known monstrosities, Asperger signed a letter condemning a little girl, Herta Schreiber, to the Spiegelgrund facility. Herta died after 2 months of poisoning with Phenobarbital and starvation. The drug depressed her consciousness making her choke on her own body fluids. As liquid filled her lungs little Herta slowly suffocated. Her death certificate read pneumonia as cause of death. In 1942 Asperger was the senior pediatrician in a commission that reviewed the health status of 210 children in an Austrian institution. Thirty-five of the children were deemed by Asperger as “non-educable”. The consequences of such a description was well known to members of the commission; it was their death warrant.

# Steve Silberman

- “The most important lesson is not that brutal regimes like the Third Reich enable evil men to do evil, but that they are able to compel even well-intentioned people to do monstrous things” (n.pr/1NIHQ0r).



# Jonathan Mitchell “autism’s gadfly”

- The author repeated his offensive statement (that I've commented on previously) that the difference between autism and a non-handicapped person is analogous to the difference between a Linux and a Windows operating system that just work differently. A more accurate analogy would be between a working computer that runs windows and a computer that constantly crashes or has constant blue screens of death and shuts down due to overheating or having malfunctioning memory chips.
- Another offensive comment is implying that the problems with autism come from oppression rather than disability as was the case with Jews at one time (and possibly still in some circumstances).



# Tommy: Self-Injurious Behavior

Tommy is a teenager who keeps hitting his head. His mom has tried blocking blows several times but keeps getting bit. He uses a helmet to protect his head from trauma, but then keeps hitting the helmet with his hands. This is the third helmet in one year, he punched the rest into shreds. Occasionally he gets his fists under the helmet and punches his ears. He is still wearing diapers and suffers from uncontrolled seizures.



*"I feel bad as people will criticize me for using restraints. They believe I should be using medications. Don't they understand that we have used all medications possible?" - Mother*

In an interview by Forbes magazine Steve Silberman stated that he had left out of Neurotribes the diaper wearers and head bangers because, "If we live long enough, we all become 'diaper wearers' eventually...Disability is a part of the human experience."



In children diagnosed with autism, obsessions and compulsions have been reported to function as a way of coping when the environment is unpredictable and as a means of helping to control the unpredictability. Anxiety often develops because of the unpredictability, and it is reduced when an individual engages in repetitive behaviors. - See more at: <http://www.pathfindersforautism.org/articles/view/parent-tips-what-about-those-obsessive-compulsive-behaviors#sthash.lspFWJG3.dpuf>



"Is flapping my hands or intensely and obsessively loving something 'weird' or wanting to be by myself the psychological equivalent of diabetes, or is it a natural and beautiful part of human diversity?"  
Julia Bascom, Director of Programs ASAN,  
<http://www.thedailybeast.com/articles/2015/02/25/they-don-t-want-an-autism-cure.html>

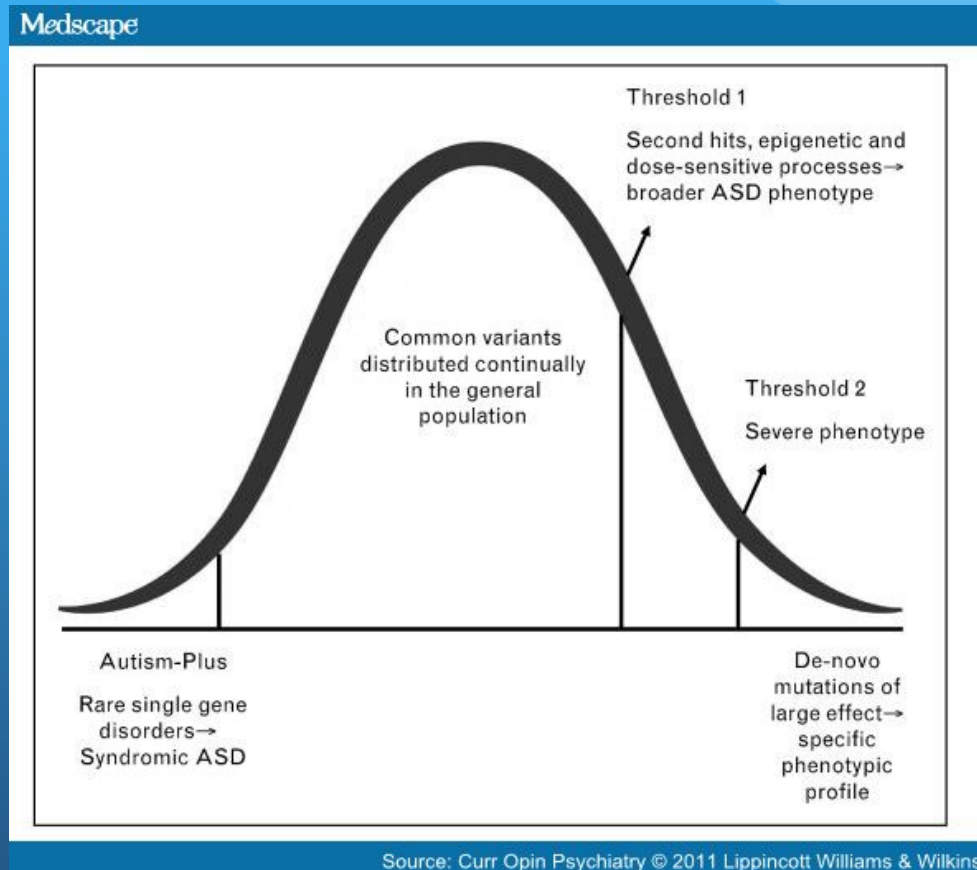
In an obsessive compulsive disorder people are unable to control either the thoughts or the activities.

[https://en.wikipedia.org/wiki/Obsessive%E2%80%93compulsive\\_disorder](https://en.wikipedia.org/wiki/Obsessive%E2%80%93compulsive_disorder)

# Comments to the Daily Beast Article

- Middle\_of\_the\_road\_guy 4 days ago  
I have a son with mild autism. He struggles to keep jobs, keep relationships and to live on his own. Yes it would be great if people were more accepting of his condition, but it would be better , much better, if he could find less turmoil and more joy in his life. Those who want no "cure" are so wrong and are cruel. Nothing more than a self centered view.
- jazzlily 5 days ago  
It's called a spectrum because of the totally different severity of each person. I can understand why parents with an autistic child you can't control their bowels or bladder, lashes out physically at them, is nonverbal, etc., may pray for a cure. Some of that "unique wiring" leaves some autistic brains in a very lonely place. The idea of a cure makes a lot of sense in many cases.
- rufustfirefly 5 days ago  
Pretty sure my sister would rather not have her son bang his head and do the other things he does.
- Gear\_Mentation 5 days ago  
We heard this s--- about deafness, too.

Autism is..."The result of normal, natural variation in the human genome." JE Robison, Psy Today 2013



Some of the sequence variations noted in ASD are common in the general population, but, when they reach a certain threshold through complex genetic, epigenetic and environmental mechanisms (e.g., epigenetic and dose sensitive processes and environmental triggers acting as second hits), result in a broad range of ASD phenotypes with a considerable overlap with other neurodevelopmental and psychiatric disorders. Those reaching a further second threshold result in a more severe form of autism phenotype; a small proportion of patients exhibit 'autism plus phenotype', where autistic features occur in the context of a single-gene disorder presenting as syndromic ASD; and specific phenotypic profiles are caused by 'de-novo' mutations

# Is autism really a disorder?

## Dogma vs. Science

- "We know that autism is not a disease, and we oppose any attempts to 'cure' someone of an autism spectrum condition, or any attempts to make them 'normal' against their will." Autism Friends Network



### Disorder vs. Condition

Simon Baron Cohen, Ph.D.

- 1) Disorder implies a biomedical cause.
- 2) Disorder implies severity.
- 3) Disorder implies suffering.
- 4) Disorder implies disability.
- 5) Disorder implies that something is broken or dysfunctional in the brain.
- 6) Disorder implies that there is only one way to be normal.
- 7) Disorder implies that there is nothing positive about the lived experience of autism.
- 8) Disorders implies the presence of cognitive defects.
- 9) Disorder implies the presence of serious psychiatric risk associated with autism, e.g. suicide.
- 10) Disorder gets you insurance cover.

# Mortality Rates for Mental Disorders

**Table 1. Standardized Mortality Ratios (SMRs) From Published Studies Evaluating All-Cause Mortality in Adult Patients With Schizophrenia, Bipolar Disorder, Depression, and Anxiety Disorders Compared With Population Controls**

Duration of Follow-up by Diagnosis, y	Evaluations, No. <sup>a</sup>	Patients, No.	Actual Deaths, No. (%)	SMR <sup>b,c</sup>
<b>Schizophrenia<sup>d</sup></b>				
<10	3	11 429	2155 (18.9)	2.60
10-20	1	99	39 (39.4)	2.83
>20	3	6722	4811 (71.6)	1.32
<b>Depression<sup>e</sup></b>				
<10	3	39 715	9153 (23.0)	2.02
10-20	3	1606	607 (37.8)	1.28
>20	3	523	340 (65.0)	1.59
<b>Bipolar disorder<sup>f</sup></b>				
<10	3	16 191	3506 (21.7)	2.57
10-20	2	389	123 (31.6)	1.45
>20	2	320	212 (66.2)	1.49
<b>Anxiety disorders<sup>g</sup></b>				
<10	1	82	4 (4.9)	0.90
10-20	2	1288	283 (22.0)	1.07
>20	1	113	31 (27.4)	1.88

<sup>a</sup> Several individual studies reported mortality outcomes for more than 1 psychiatric indication. The number of evaluations represents the number of studies that reported an SMR for the specified indication during the specified follow-up period.

<sup>b</sup> Each of the identified studies calculated and reported the SMR by retrospectively identifying a cohort of psychiatric patients and following medical and death records over a period of time. The mortality risk in the psychiatric patients was then compared with that in a matched cohort control or with those in the general population to create a ratio between observed deaths in the psychiatric patients and what would be expected in the population or matched control cohort.

<sup>c</sup> There was considerable heterogeneity in the number of psychiatric patients included in the studies as well as the reported SMRs at follow-up. To minimize this variability in the SMRs, we therefore weighted the reported SMR for each evaluation by the total number of psychiatric patients that were included and reported the mean overall SMR for each row total.

<sup>d</sup> References 7, 9-11, 13, 15, 16.

<sup>e</sup> References 4-6, 8-10, 12, 14, 16

<sup>f</sup> References 4, 6, 9, 10, 12, 14, 16.

<sup>g</sup> References 8-10, 12.



# Wikipedia List of Neurological Conditions

Abulia  
Agraphia  
Alcoholism  
Alexia  
Alien Hand Syndrome  
Alzheimer's disease  
Amaurosis fugax  
Amnesia  
Amyotrophic lateral sclerosis

[Angelman syndrome](#)  
[Aphasia](#)  
[Apraxia](#)  
[Arachnoiditis](#)  
[Arnold-Chiari malformation](#)  
[Asperger syndrome](#)  
[Ataxia](#)  
[Ataxia-telangiectasia](#)  
[Attention deficit hyperactivity disorder](#)  
[ATR-16 syndrome](#)  
[Auditory processing disorder](#)

# The Seinfeld Syndrome: Self Diagnosis



In an interview with Brian Williams of NBC's "Nightly News", Jerry Seinfeld proclaimed that on a very drawn-out scale he fell on the autism spectrum.

Members of the Neurodiversity movement, especially Ari Ne'eman president of the Autistic Advocacy Network, hurriedly jumped into the spotlight and commended Mr. Seinfeld for his expressions. A few days later Jerry Seinfeld backtracked during an interview with "Access Hollywood" and said, "I am not on the spectrum".

- Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning. DSM5

# Self-Diagnosis



"I'm 50 and suspected I had aspergers all my life cause I dont relate good with people [sic] and I have a lot of the symptoms but when i wanted to get tested for it, the psychiatrist talked to me for about 5 minutes and told me i didnt have it, and never tested me for it, but if i take an online test i pass it every time, any suggestions?"

Social Security: A medically determinable impairment is one that is established by medical evidence that consists of signs, symptoms and medically acceptable clinical and laboratory diagnostic techniques... not only by the individual's statements.

# Liz Bell an her son Tayler

- As for Ne'eman distaste for the word "cure", he is unflinching nor does he offer sympathy. The total imperviousness she witnessed seemed to reflect not only conviction, but also an inability to take on a point of view other than his own.



# Neurodiversity and the Anti-Cure Perspective

- Members of the various autism rights organizations view autism as a way of life rather than as a disease and thus advocate acceptance over a search for a cure. Some advocates believe that common therapies for the behavioral and language differences associated with autism, like applied behavior analysis, are not only misguided but also unethical.
- The "*anti-cure perspective*" endorsed by the movement is a view that autism is not a disorder, but a normal occurrence—an alternate variation in brain wiring or a less common expression of the human genome. Advocates of this perspective believe that autism is a unique way of being that should be validated, supported and appreciated rather than shunned, discriminated against or eliminated. They believe quirks and uniqueness of autistic individuals should be tolerated as the differences of any minority group should be tolerated and that efforts to eliminate autism should not be compared, for example, to curing cancer but instead to the antiquated notion of curing left-handedness.
- Jim Sinclair was the first individual to communicate the anti-cure or autism rights perspective in the late 1980s.



# Criticisms and counter-movements

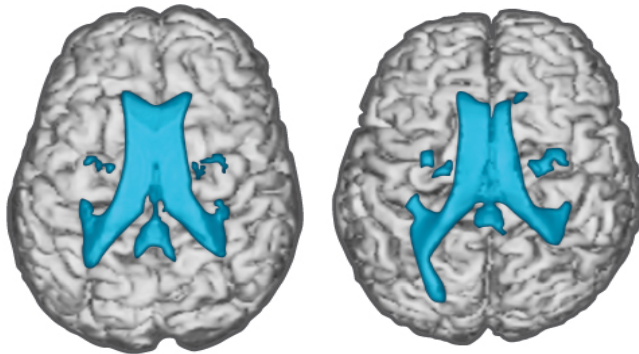
“Oppressors searching for a cure”

“Curebie”

- Parents with the perspective of autism as a disorder (which is called the *“pro-cure perspective”* in the autism rights movement) believe that therapy with the intent of extinguishing stereotypically autistic behavior is in their children's best interests; they see this as a treatment that will reduce their children's suffering. These critics say ABA gives autistic children the best chance of success in adulthood, as they either do not believe it is possible that adult society could accommodate autistic people (who have not been trained by ABA to exhibit neurotypical behavior at all times) or they do not believe it is desirable to do so.

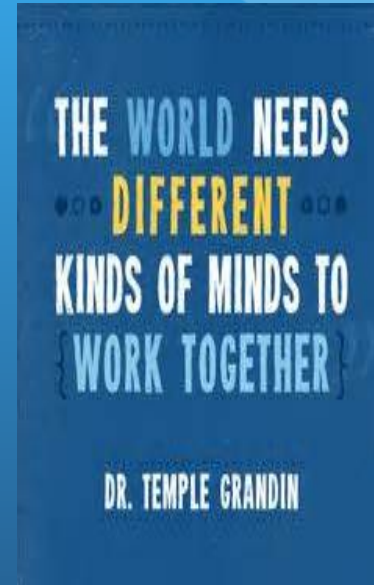
“Slaves to conformity”

# Temple Grandin



Normal Brain

Grandin's Brain



Temple Grandin, one of the first people to chronicle her struggles with autism, says there needs to be more research into how the condition affects people's senses. (<https://www.questia.com/newspaper/1P3-3119766041/temple-grandin-more-research-needed-on-how-autism>)

# Jonathon Tarbox, Ph.D.



- “I think it’s critically important to acknowledge the potential strengths associated with autism, but it’s equally important, if not more important, to reiterate the notion of the right to effective treatment.”
- “If an individual with [autism] is having a difficult time in their life because they don’t know how to do something that they want to do, and there is a proven effective method to teach that skill, then we as fellow humans have a moral and ethical responsibility to provide the treatment that addresses it.”

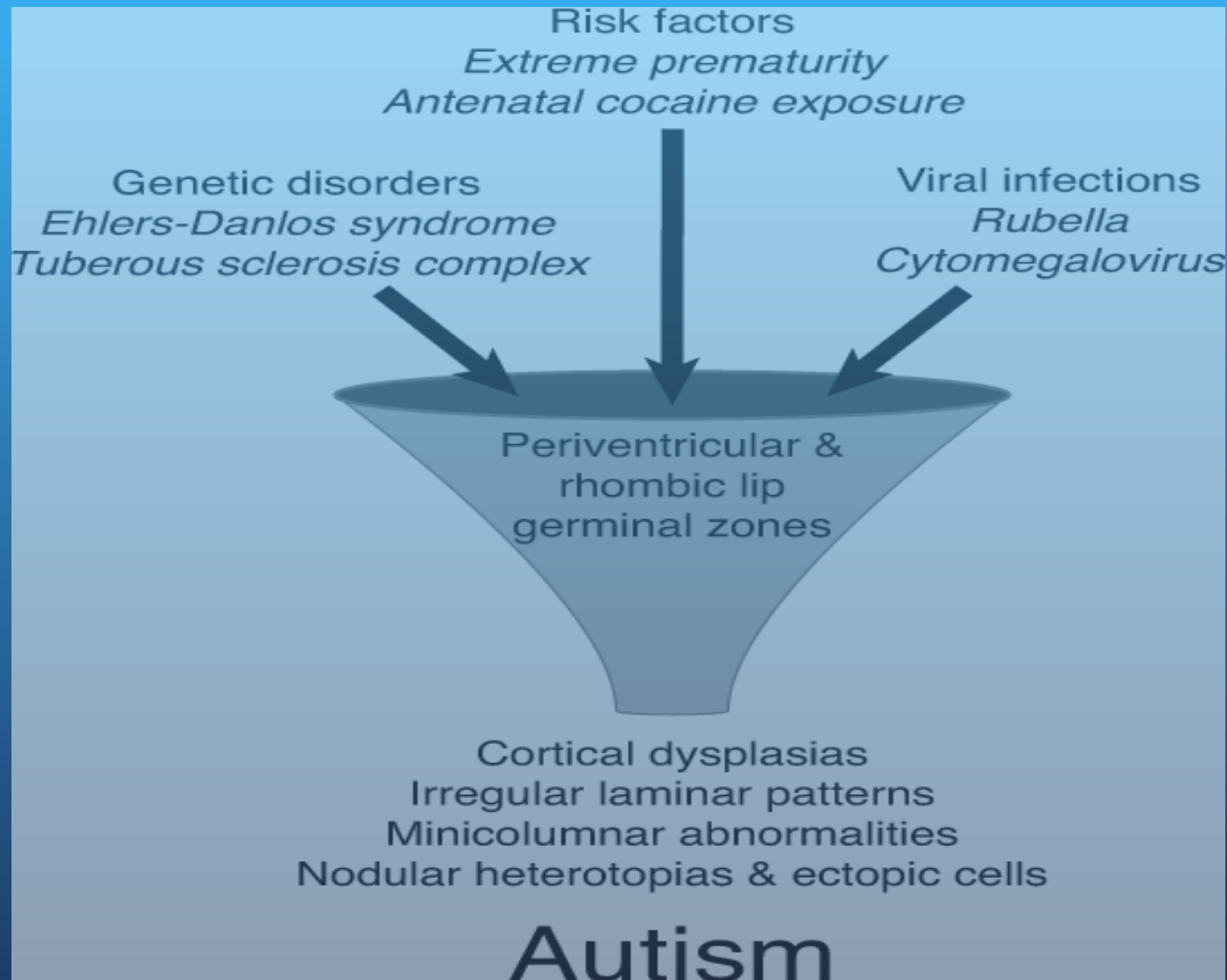




The End

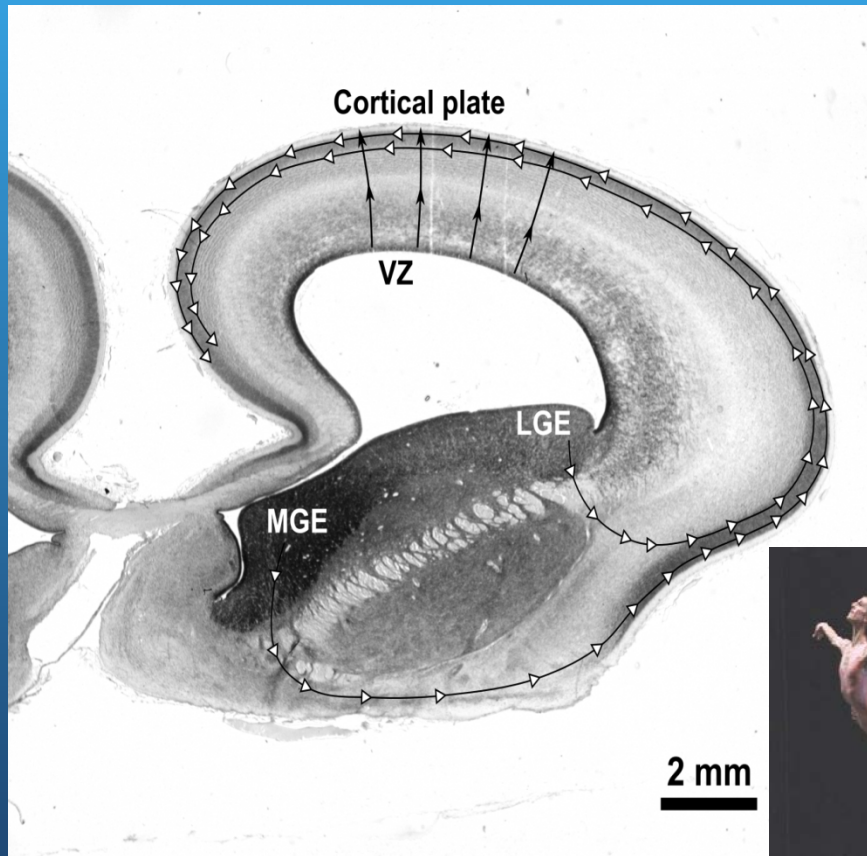


# Locus Minoris Resistentiae

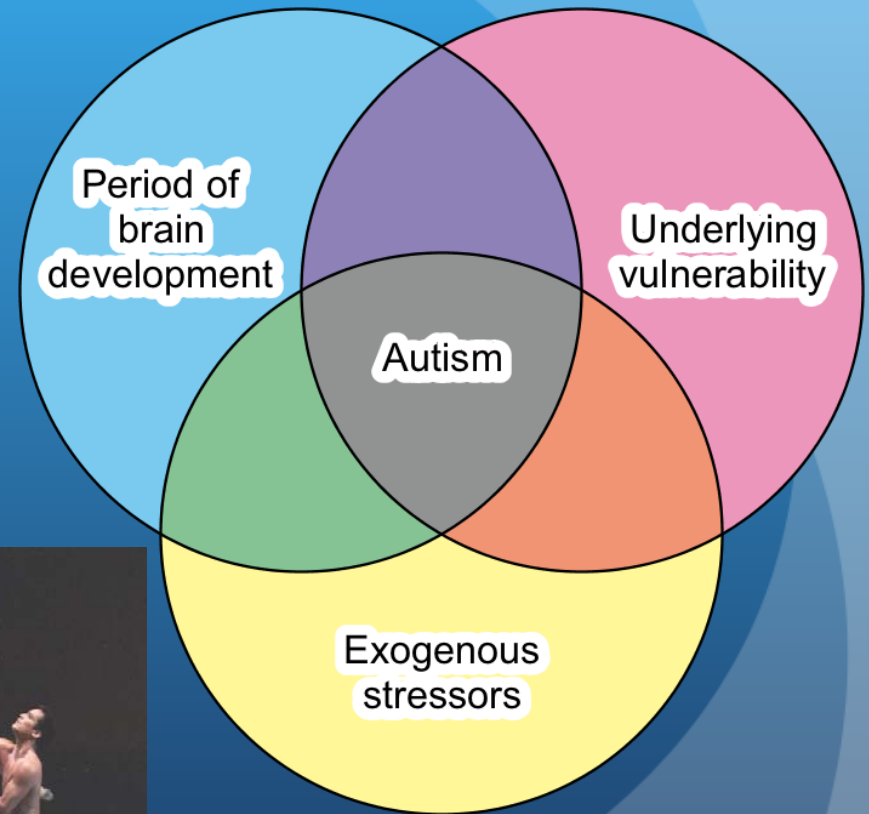




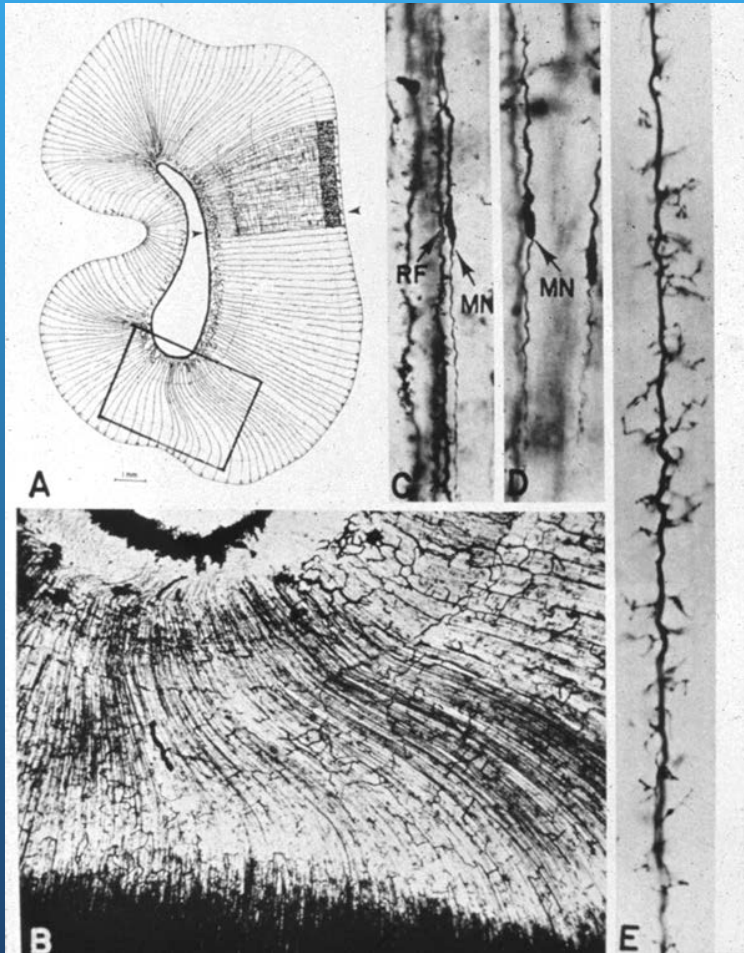
# Pyramidal Cells and INTERNEURONS



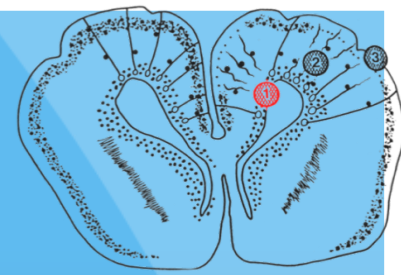
## Triple-hit Hypothesis



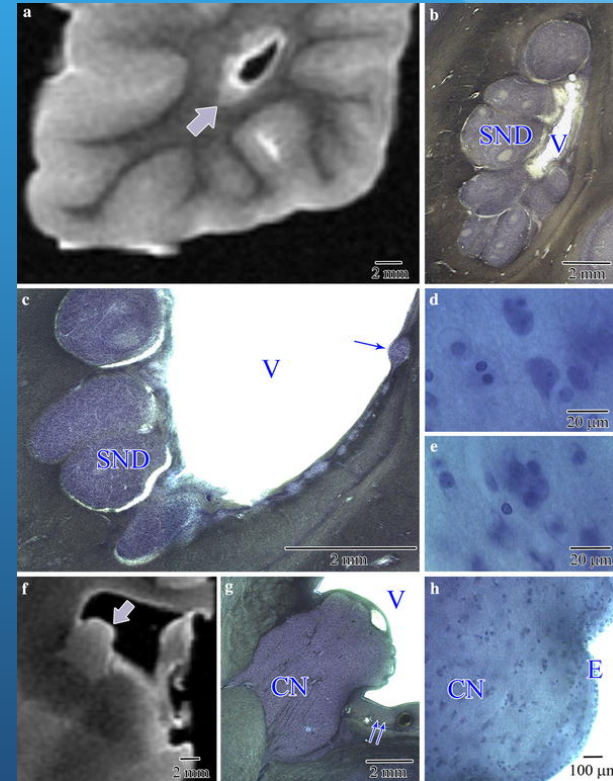
# Neuroarcheology



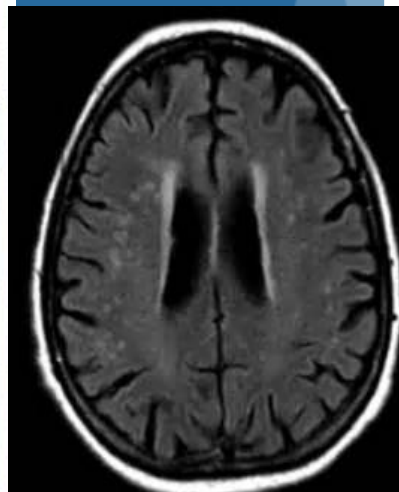
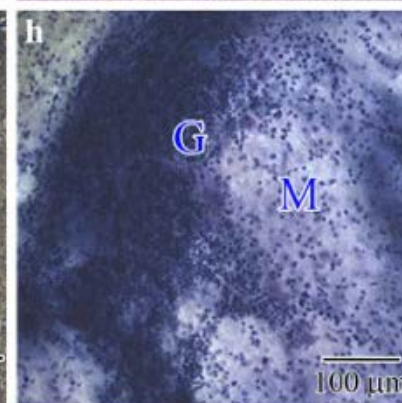
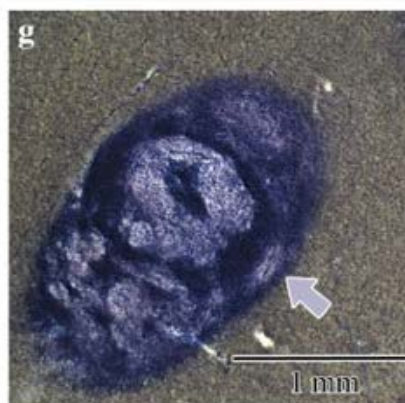
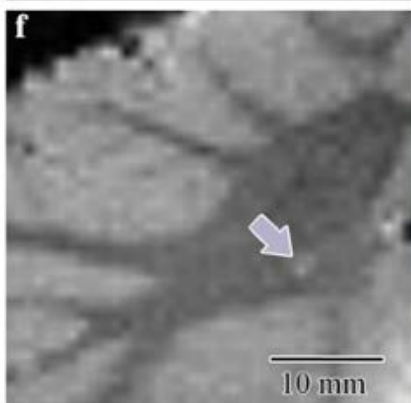
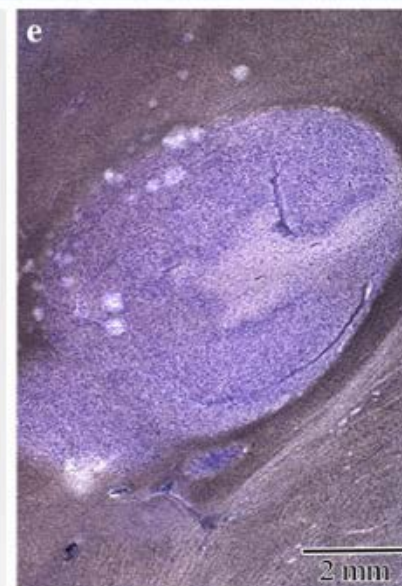
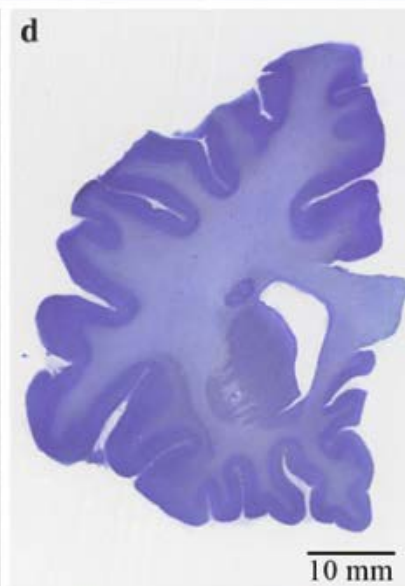
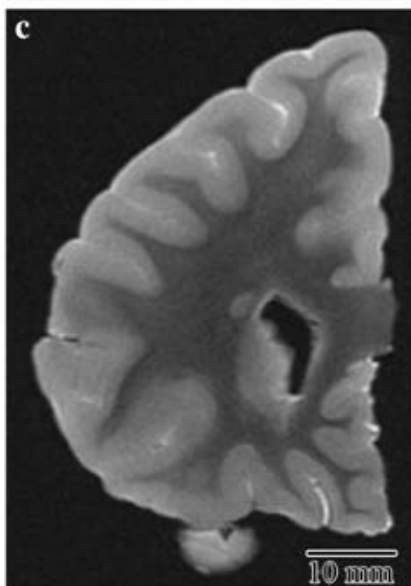
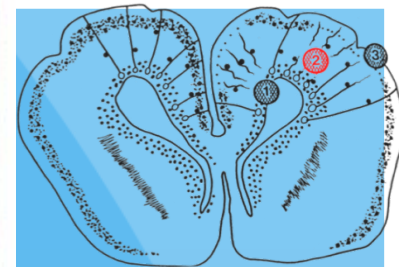
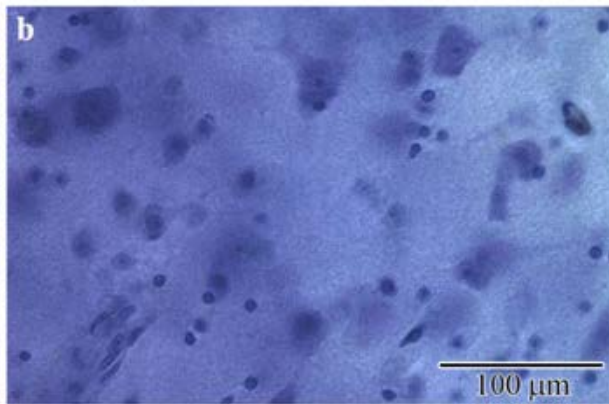
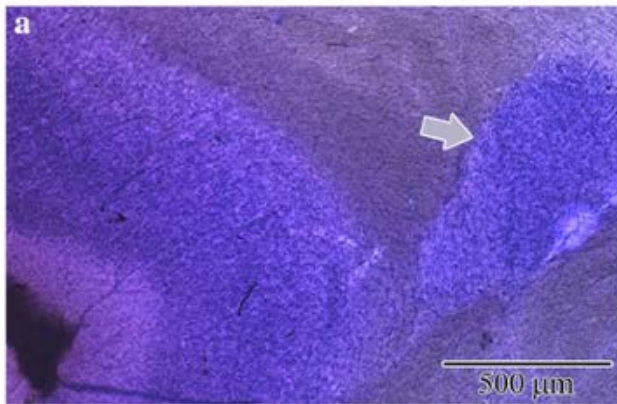
# Heterotopias in Autism



- “Heterotopias” are malformative lesions comprised of “normal” cells in the wrong location.
- Studies in autism suggest a defect in radial migration involving: 1) its onset out of their precursor field, and, 2) ongoing migration through the white matter (intermediate zone).







# Quantification of the Gray/White Matter Boundary in Autism Disorders

Spectrum

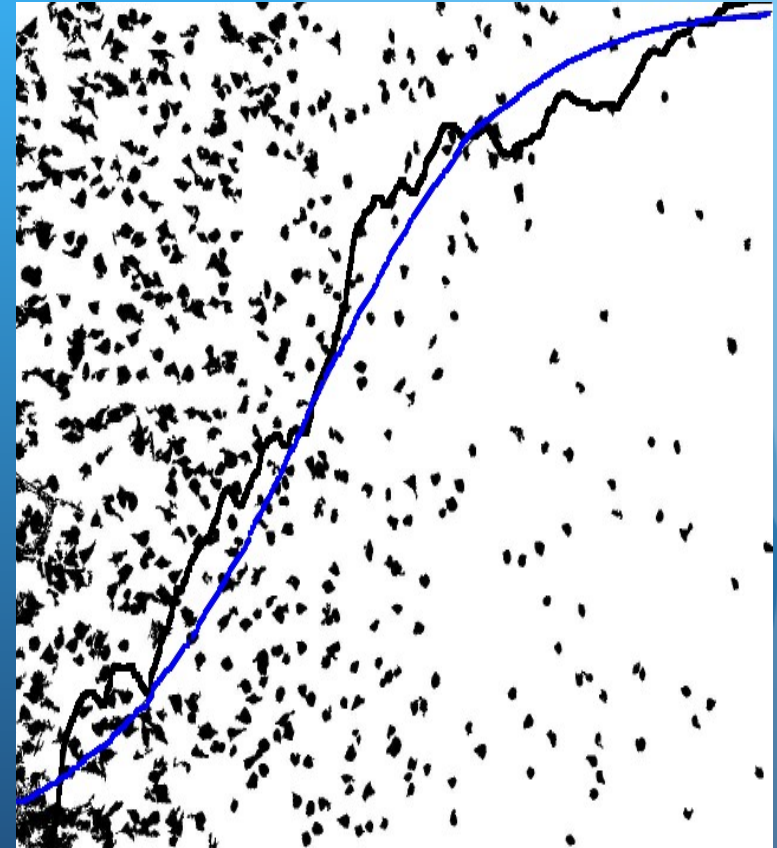
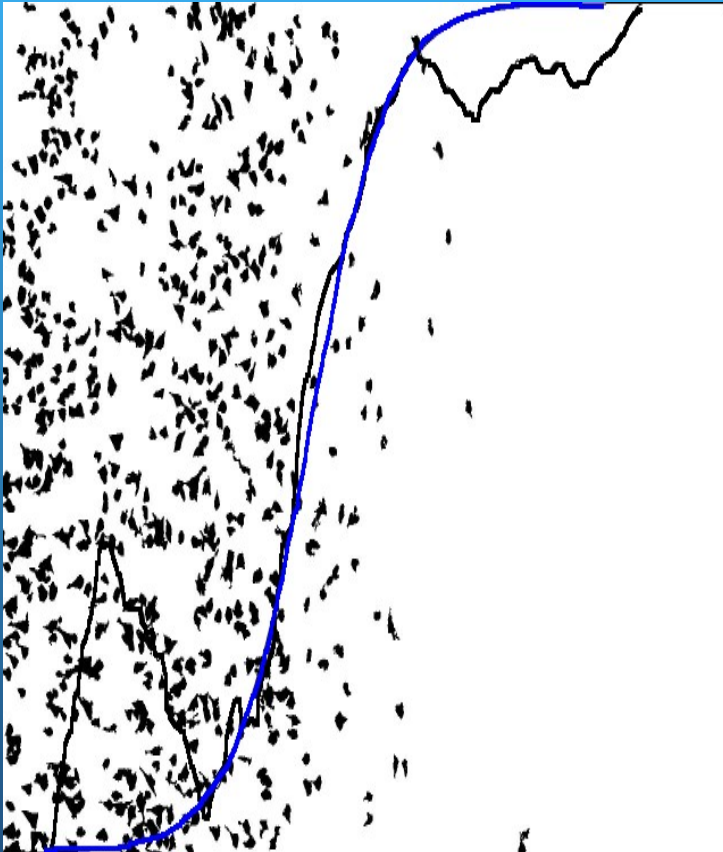
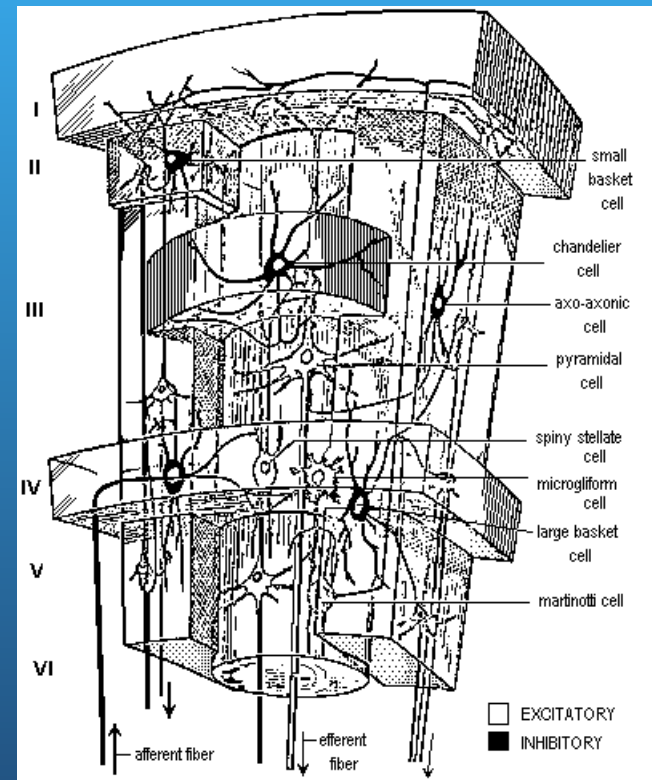
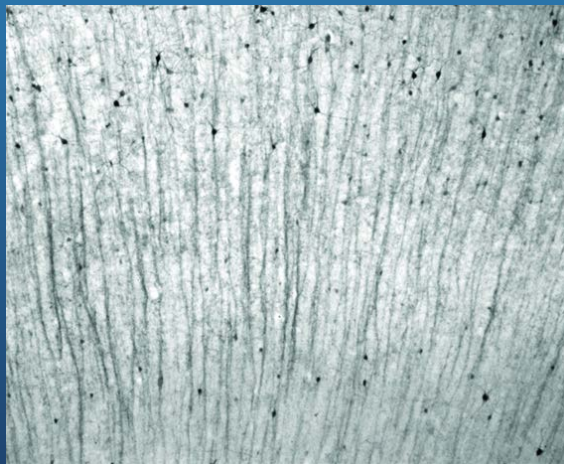


Image at left from control brain and on right from an autistic individual (Avino and Hutsler, 2010).



# Shower Curtain of Inhibition



# Information (Neuronal Activity) and Background

Stimulus



Low background



High background

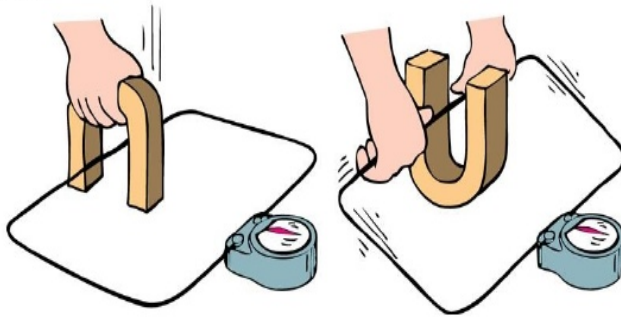


Pathological



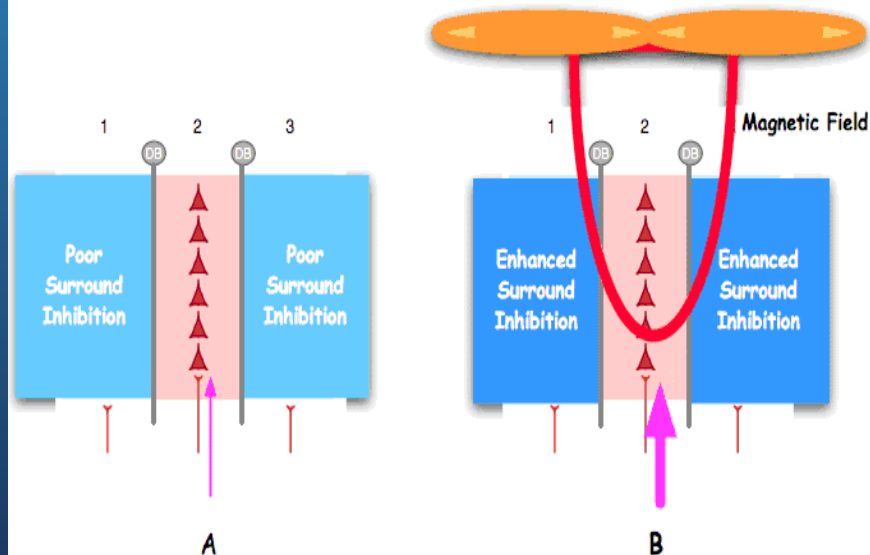
# Electromagnetic Induction

Voltage is induced whether the magnetic field of a magnet moves near a stationary conductor *or* the conductor moves in a stationary magnetic field.

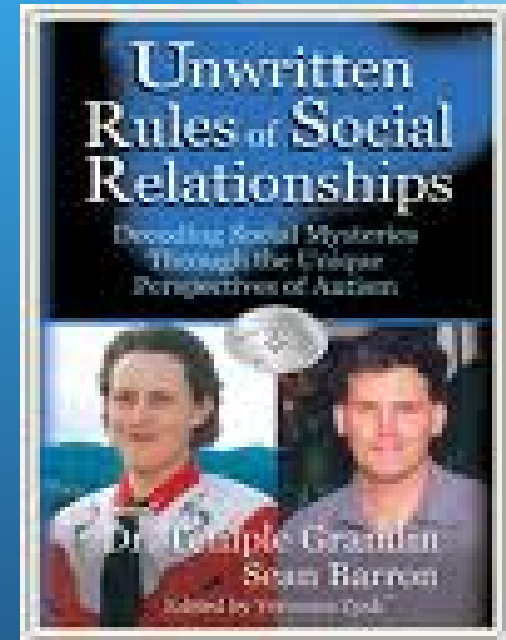
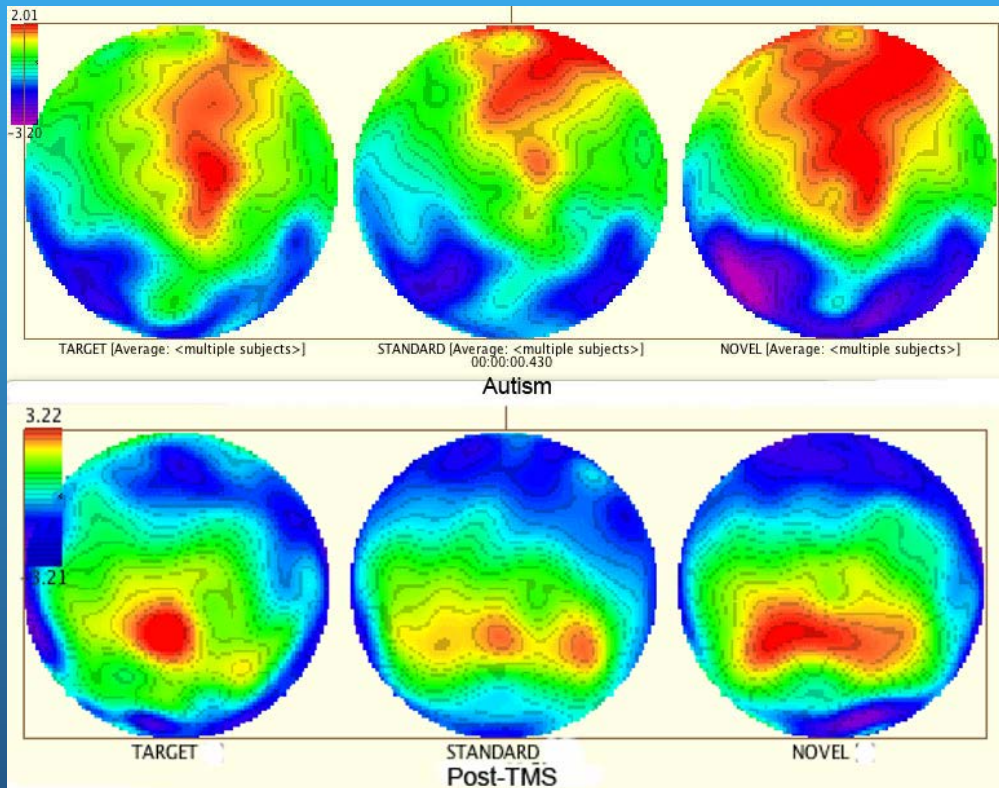


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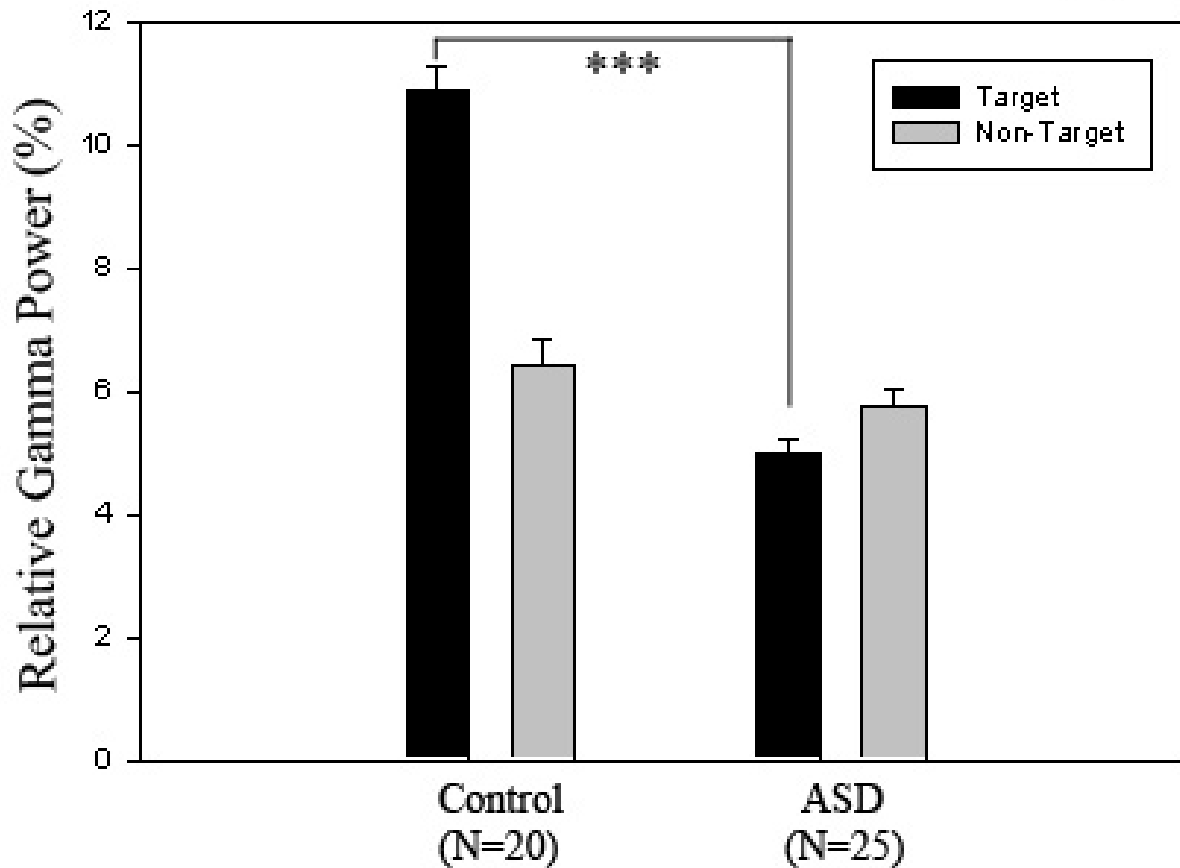


# Changes after rTMS



Before rTMS participants with ASD showed large responses over the frontal cortices to all three stimuli with evidence of a lack of stimulus differentiation.

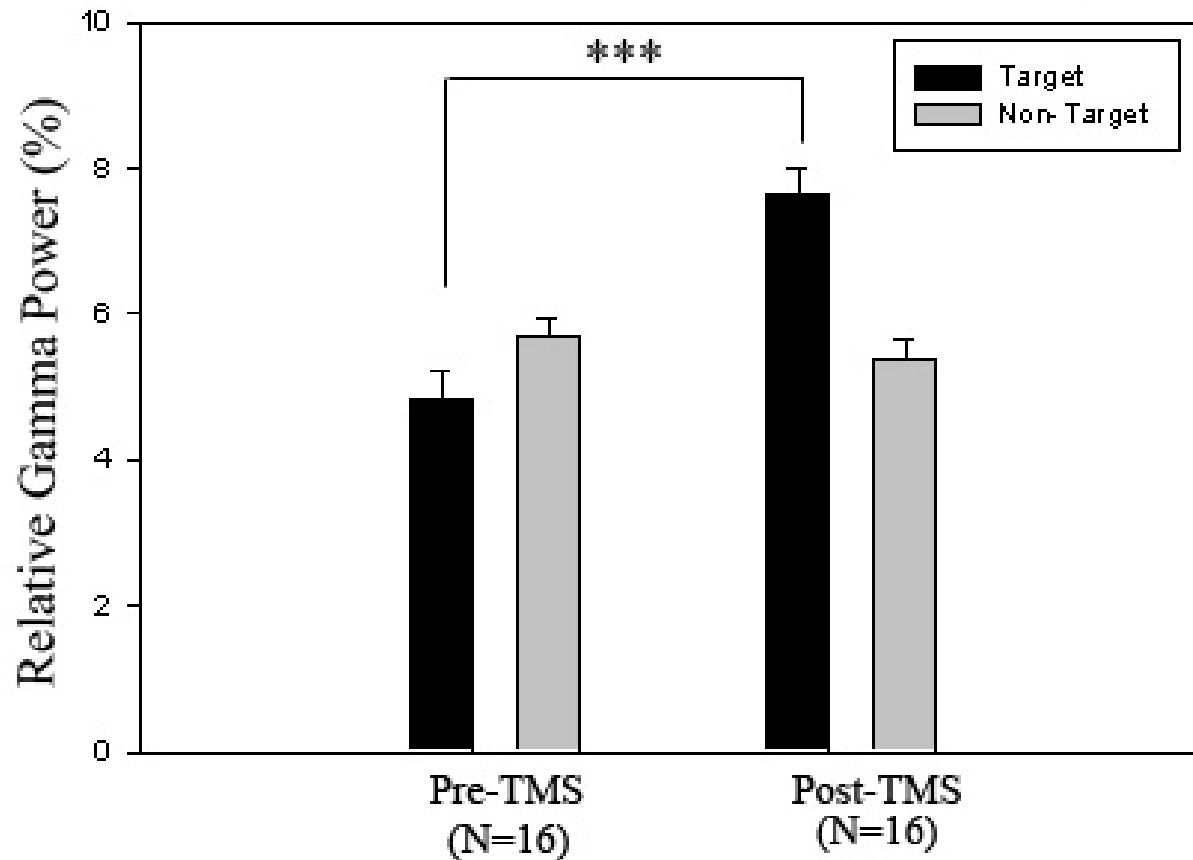
## Baseline Evoked Gamma Power at Frontal Sites (F1, F2)



Participants with ASD also showed evidence of a lack of stimulus discrimination compared to controls evidenced by gamma EEG power.

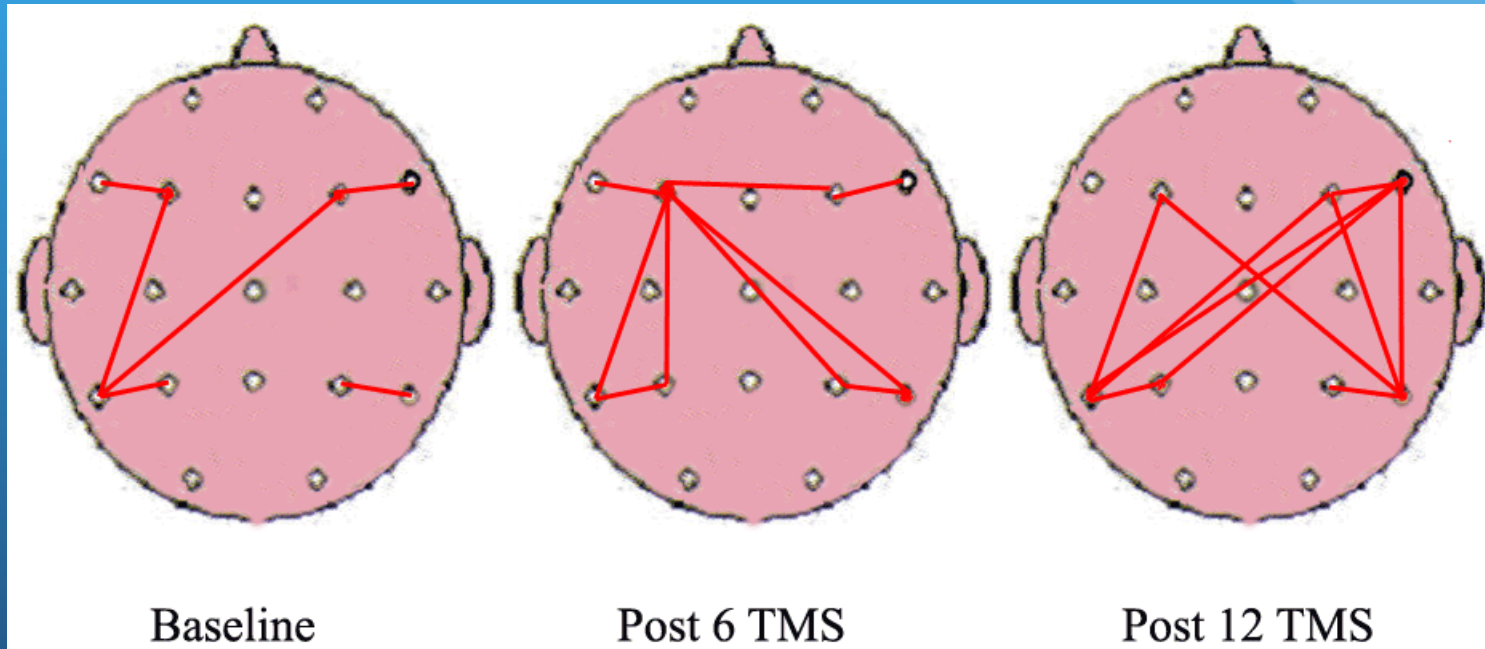


## TMS Affects Evoked Gamma Power at Frontal Sites (F1, F2)



After rTMS individuals with ASD showed significant improvement in cortical discrimination of stimuli as evidenced by gamma EEG power.

# Scalp coherence in gamma range post rTMS in autism



# Neurological Disorders vs. Neurological Variability

- Neurological disorders are diseases of the central and peripheral nervous system. In other words, the brain, spinal cord, cranial nerves, peripheral nerves, nerve roots, autonomic nervous system, neuromuscular junction, and muscles. These disorders include epilepsy, Alzheimer disease and other dementias, cerebrovascular diseases including stroke, ... etc.
- Mental disorders, on the other hand, are "psychiatric illnesses" or diseases which appear primarily as abnormalities of thought, feeling or behaviour, producing either distress or impairment of function. WHO, February 2014 (<http://www.who.int/features/qa/55/en/>)
- Note DSM: Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.

# TESTIMONIALS

- Roger Kulp: I have read before that neurodiversity had its roots in the antipsychiatry movement of the 1960s. One complaint I have with neurodiversity, is it remains stuck in that past. That it ignores all we have learned in the last couple of decades about the immune, metabolic, and genetically controlled mechanisms behind the various forms of both autism, and schizophrenia. Maybe ignore is the wrong term, perhaps willful ignorance is more like it.
- Yuval Levental: I first learned that I had Asperger's at the age of 15 during the summer of 2008. I discovered it on the internet, but I don't remember how. I then bought the book "The Complete Guide to Asperger's Syndrome" by Tony Attwood, an Australian psychologist. He speculated (key word, speculated) that Einstein had mild autism. This made me pretty obsessed with neurodiversity. I also discovered the WrongPlanet forum, a pro-neurodiversity forum, which just added even more fuel to the fire. For a good part of the next year, I would often obsessively brag about how "special" I was to others. The problem was, I had nothing to show for it. As mentioned before, I wasn't at the top anymore, and sometimes far from it, in STEM subjects. Basically, I annoyed a lot of people. Worse, I tried to get to know other autistic people, and they weren't excited about like I was, namely because a bunch of them had worse academic struggles than me.