Autism and My Path Through Life, 3rd Edition

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No Speech Until Age 4
Brain Variability

➢ Cognitive versus more social emotional

➢ Person with Autism has more relatives in technical careers

➢ Person with Bipolar as more relatives in creative careers
Thomas Edison

- Labeled Addled and Hyperactive
- Memorized Every Street
Albert Einstein
No speech at age 3 Temper tantrums
Emotions are Different

I cried when I read about the 81-year-old scientist who keeps the 40-year Voyager Space Crafts alive.

Credit: NASA/JPL
Voyager has left our solar and we are still learning from it.

Credit: NASA/JPL
Ultimate NASA Geek Out
Do Not Become Hung Up on Labels

- DSM-5 autism is a huge spectrum ranging from top scientists, artists, and musicians to severe behavioral problems which makes normal activities impossible.

- At age 3, non-verbal kids that become high functioning and kids that remain severely impaired look similar.
➢ Grandparents and parents often tell me they have autism after a child was diagnosed.

➢ Most had successful careers. Learned work skills as children.

➢ Diagnosis helps fully verbal teens and adults with relationships.
Too Many Kids Become Their Labels and Never Get to Do the Fun Stuff
Visiting the Vehicle Assembly Building Was an Emotional Experience
Foundation Principles

✓ Sudden surprises scare
✓ Continuous gradual stretching to gain new skills
✓ Do not overprotect
✓ Continually teach life, social, and work skills
✓ Limit screen time and give your child choices of interesting real activities
• A good teacher is gently insistent
• Early educational programs for non-verbal children are essential
• Don’t Wait! Grandmothers may be the best volunteers!
Teach Turn Taking

✓ Learn how to wait and take turns
✓ Teach with board games or an electronic game
✓ Phone MUST BE physically passed back and forth between two or more individuals
Use Teachable Moments When the Child Makes a Social or Manners

✓ No Yelling!

✓ Never say NO or STOP IT

✓ Calmly give the instruction and tell the child what he/she should do. Also explain the reason why you use normal language.
- A child has to be stretched just outside his/her comfort zone to keep learning new skills.
- Pushing too hard causes sensory overload and no progress.
- Never have sudden surprises. This causes fright and tantrums.
- Adults and teenagers must also be pushed to try new things and keep learning.
- Create opportunities for child to use language and build on normal behavior.
- Limit video games and video watching to one hour on weekdays, two hours on weekends
- Do not allow a child to become a recluse in his/her bedroom
- Do allow some calming down time for stimming or electronics
- Recent studies show greater risk for depression in teen’s excessive social media use
○ Provide choices when doing a “stretching” activity

○ Examples of stretching activities:
  ➢ Karate or Cub Scouts
  ➢ Robotics or soccer
  ➢ Theater or band
  ➢ Debate club or Star Trek Club

○ The activities should involve interaction with other people outside the home
Child blocks ears because certain sounds hurt

Sounds are better tolerated when the child initiates them.

_Little Rainman_ by Karen Simmons
○ Give the child or adult control over stimulus exposure

○ Do not wear head phones all the time. They make ears more sensitive

○ Keep head phones with you. Try NOT to wear them
Sensory Perception in Autism

“Sensory symptoms are core primary characteristics of the neurobiology of autism.”

- Robertson and Simon Baron-Cohen, 2017; Nature Reviews - Neuroscience
Auditory Threshold Normal

Hearing auditory detail is impaired

Stretch out and enunciate consonants

Hearing may be like a bad mobile phone connection

Occurs with many disorders

Hearing may fade in and out like a poor mobile phone connection

Echolalia increases as receptive language becomes worse.
Jacqueline Roberts, 1997
Echolalic Children Use Phrases from Movies in the Real World
Attention shifting slowness occurs with many disorders.

Takes longer to shift back and forth between two different things.

Slow Processing Speed
Viewer with Autism (Red Line)
Normal Comparison Viewer (Yellow Line) Shows Attention Shifting Slowness

Ami Klin
Give the Child Time to Respond Their Brain May be Like a Phone With A One Bar Signal

Photo Credit: dappered.com

Photo Credit: Clarisa Clarity
Visual images break up and fragment similar to migraine headaches

Fig. 4. The stages of “mosaic” vision, as experienced during migraine aura (see text)

Oliver Sacks
Examples of Video Interference

Source: www.snug.com
Signs of Visual Processing Problems in Autism, Dyslexia, and Sensory Processing Disorder

✓ Hates escalator

✓ Print jiggles on the page during reading

✓ Eye exam may be normal
Words vibrate and jiggle on page.

Trends in Neuroscience, Vol. 20, pp. 147-152, 1997

Perspectives

J. Stein and V. Walsh – Temporal processing and dyslexia

Words can be hard to read for several different reasons.

Fig. 1. Words can be hard to read for several different reasons. Visual confusions can cause letter reversals (‘worbs’), distortion and blurring (‘can be hard to read’) and superimposition (‘for several different’).

Dyslexia is caused by defects in brain circuits which process fast moving auditory and visual information. Reading and doing number work with one eye may improve reading and help stabilize abnormal eye movements.
Interventions for Visual Processing Problems

- Incandescent lamp by desk
- Block fluorescent lights or LED with a hat
- Laptop or tablet computer
- Gray, tan, or pastel paper for reading
- Irlen lenses or pale colored glasses
- Balancing games - sit on ball
- Prism glasses - Developmental Optometrist
Severe Sensory Problems

- Extreme effort required to screen out background noise and visual distractions
- Needs frequent breaks to prevent sensory overload
- Mono-channel
- Body boundary problems
- Often an auditory thinker
Environmental Enrichment is an Effective Treatment for Autism

✓ Stimulate two senses simultaneously
✓ Adjunct to ABA and speech therapy
✓ One of the senses is always smell or touch
✓ Novelty and keep changing the stimulation
✓ Use simple economical things. Two 15 minute sessions per day
Nonverbal Individuals who Type Independently Describe Severe Sensory Problems

- How Can I Talk if my Lips Don’t Move by Tito Rajarish Muhopadhyay
- Carly’s Voice by Arthur Fleischmann with Carly Fleischmann
- The Reason I Jump by Naoki Higashida
- Fall Down 7 Times Get up 8 by Nooki Higashida
A music mixing board is a good model for many different personality traits. There is no firm dividing line between mild autism and geeks and nerds.
High Definition Fiber Tracks of Temple Grandin
Axon Projection Field Much Less Organized

Temple Grandin

Normal Age Matched Subject

©Walter Schneider U. Pittsburgh
Speech Production

Visual Representation
Auditory

Walt Schneider, Univ. of Pittsburgh
Develop the Child’s Strengths
- My ability in art was always encouraged
- Academic skills are uneven
- To reduce behavior problems due to boredom, provide more advanced school work in the child’s area of strength
My mind works like Google for Images

Little Rainman by Karen Simmons
Notice Visual Detail - Helpful in Animal Behavior Research
Increased Auditory Capacity

✓ Enhanced pitch discrimination
✓ Better at detecting unexpected sounds
✓ Easily distracted
✓ Explains sensory overload

Source: Remington and Fasmler, 2017
Half the cattle in the U.S. are handled in equipment I have designed.
Starting My Career in Construction

Swift, 1974

McElhaney Cattle, 1976
Sold my work by showing my portfolio
Sold My Work by Showing My Portfolio
Big Complex Projects for Skilled Trades
Worked with people who had autism or were dyslexic on this type of project
I realized my thinking was different when I asked other people to think about church steeples
Most people see in their imagination a generalized generic steeple.
I see only specific pictures of steeples I have observed

They flash into my memory like a series of still Googled pictures
My childhood church
First category under steeples
Local churches in Fort Collins
Secondary category under steeples
Famous Steeples
Mormon Temple, Washington, D.C.
Third category under steeples
Famous Steeples
Old North Church - Boston
Third category under steeples
Famous Steeples
Notre Dame
Famous Steeples
Westminster Abbey
Brain Scans

Control  

T. Grandin

Humphreys, Minshew, Behrmann, and Cibu, 2006
Brain Scans

Humphreys, Minshew, Behrmann, and Cibu, 2006
Abnormalities in Left Hemisphere

University of Utah, 2010
Pilot’s Checklist

✓ Use for tasks with a sequence of steps

✓ Do NOT load working memory
Develop Talents in the Individual’s Specialist Brain

1. Photo Realistic Visual Thinking – Poor at algebra

2. Pattern Thinker Music and Math – Poor in reading

3. Verbal Facts Language Translation – Poor at drawing

4. Auditory Thinker – Visual perception fragmented

There can be mixtures of these thinking types.
Use a Variety of Teaching Methods

- Reading: Try phonics or whole word
- Math: Try the old fashioned methods
- Some college students were never taught practical math
Two Categories of Mathematicians

Algebraists
\[ a^2 + b^2 = c^2 \]

Geometers – See this figure

Masha Gessen – Perfect Rigor, 2009
Use Google Image Search for Visual Math Lesson

- Geometry
- Trigonometry
- Calculus
- Origami golden ratio
- Fractals
- Symmetry
Hands-on Activities Taught
Practical Problem Solving Skills

I learned from my mistakes
Some teenagers today do not know how to connect a garden hose
All my thinking uses specific examples to create concepts.

It is bottom up thinking and not top down thinking.

I learned ALL concepts using specific examples put into categories.
Sensory thinkers sort specific pictures, sounds, touches, and

Little Rainman by Karen Simmons
Bullies Called Me Tape Recorder

Is autistic learning just memorization? It is memorization and scripting, but as more information is memorized, it can be assembled into more and more categories which will help thinking to become more flexible.
Teach Number Concept Generalization

- Count a variety of different kinds of objects
- Addition and Subtraction - Teach with many objects
- Fractions – Teach by cutting up fruit and paper circles
Teach “Position” Words with Several Specific Examples

- Walk **down** the stairs
- A plane goes **down** and lands
- Put a cup **down**
- Lie **down** on the bed
Objects are More Interesting than Faces

T. Grandin

Blue = objects

Control

Red = faces

Humphreys, Minshew, Behrmann, and Cibu, 2006
Make Friends Through Shared Special Interests

- School Clubs and Activities
- Organizations such as Scouting, FFA and 4-H
- Maker Community Groups
- Careers
- Classes that really interest an individual
My 1950’s upbringing taught me many important social and job skills. Everything was learned by categorizing specific examples into these concepts:

- Turn taking in conversation and activities – such as board games
- Being on time
- Doing family activities I disliked
- Party hostess at family parties
- Saying please and thank you
➢ Parents and teachers must work together as a team
➢ The Rules should be the same at home and school and be consistently enforced
Teaching Social Skills is Like Training a Person How to Behave in a Foreign Country

- Shaking hands
- Eye contact when meeting people
- Ordering food in restaurants
- Table manners
- Shopping – Talking to store staff
- Doing household chores that benefit the entire family
Eccentric is acceptable; being dirty and rude is not.

Do not try to de-geek the geek!

Photo Credit - Reuters
NASA Space Scientist Cries When the Shuttle Was Cancelled

It’s ok for Geeks to cry!
Rule System

1. Really bad things
2. Courtesy rules
3. Illegal, but not bad
4. Sins of the system
Need to Teach Values for a Good Life

✓ Golden Rule – Teach one specific example at a time
✓ Teach the importance of controlling anger and making the world a better place
✓ Media in 1950’s taught good values
The squeeze machine helped reduce anxiety and panic attacks.
Things I was Afraid of in My 20’s

✓ Airplanes
✓ Public speaking – walked out during my first talk
Got Over It When an Airplane Became Interesting
➢ Fear is the main emotion in autism. My amygdala (fear center) is three times larger (University of Utah, 2010)

➢ A low doses of antidepressant has controlled my anxiety – Started early 30’s

➢ *Thinking in Pictures* – Chapter “A Believer in Biochemistry”

➢ High doses of antidepressants may cause insomnia or agitation
Using pressure to calm the nervous system during therapy
Sometimes speech is easier when the child is swinging
Sitting on a ball and wearing a weighted vest helps concentration. Use for 20 minutes then take off for 20 minutes.
It is important to desensitize touch sensitive autistic children so that they will enjoy affection. Feeling the good feelings of being held helps to develop feelings of kindness.
My Elementary School Life Skills Training

- Party hostess at family parties and shake hands with guests
- Sold candy to neighbors for charity
- Shopped by myself for small toys and snacks
My Work Experience

- 13 years of age - Sewing job
- 15 years of age – Cleaning horse stalls
- 16 years of age – Aunt’s ranch
- 16 years of age – Roofing
- 17 years of age – Sign painting
- College – Research Lab – Rent houses
I was a poor student but I learned lots of valuable work skills in high school. I did building projects that other people appreciated.

Before

After
Freelance Sign Painting at the Carnival

Photo by Leo
Sign Painting Business
Scheduled Tasks Outside the Home to Teach Work Skills to Both Children and Adults

- Walking dogs for the neighbors
- Maintaining computers
- Selling artwork or crafts
- Volunteer jobs at a church or community center
- Working in a farmer’s market
- Volunteer at Animal Shelter or Pet Store
The LEGO Mindstorms NXT 2.0 Discovery Book

Kids good at Legos need to progress to using hand tools

www.discovery.laurensvalk.com
People Were Impressed
With My Drawings
Sell Yourself with a Portfolio

✓ Put it on your phone
✓ 30 second WOW
Cattle move easily through the wide curved lane to the crowd pen.
Half the Cattle in North America are Handled in Systems I Designed
My Design in 3D Drawing Software SketchUp

Search for “sketchup spectrum”
Free College Courses

- U.S. National Science Digital Library Project
- Khanacademy.org
- Code Academy
- Udacity.com
- EdX Free courses – Stanford and MIT
- Physics Education Technology PhET
- Coursera
- Wolfram Mathematica
- Code.org
Show Kids Interesting Things

Put business and science magazines in the school library
The Guys Have Fun with Stuffy the Mechanical Cow on the HBO Movie Site
Avoid Interviews
Find the Back Door
I was wearing my portfolio. People respect ability.
Finding Mentors and Teachers

- My Mother
- Elementary School Teachers
- Mr. Carlock High School Science Teacher
- Aunt Ann on the Ranch
- Jim Uhl – Agate Construction
Jobs for Visual Thinkers

- Industrial design
- Computer network specialist
- Graphic arts
- Drafting
- Auto mechanic
- Computer repair
- Handcrafts
- Convention AV technician
- Photographer
- Animal trainer
- Architect
- Veterinary technician
Jobs for Music and Math Thinkers

Math teacher
Scientific researcher
Electronics technician
Music teacher
Chemist

Computer programmer
Engineer
Physicist
Musician/composer
Statistician
Jobs for Verbal Thinkers

- Stocks and bonds analyst
- Journalist
- Translator
- Librarian
- Copy editor
- Accountant
- Specialty Retail
- Bookkeeper & record keeper
- Budget analyst
- Special education teacher
- Book indexer
- Speech therapist
- Inventory control specialist
- Legal researcher
- Stage actor
Jobs for People with Poor Verbal Skills or Non-Verbal

- Shelve Library Books
- Factory Assembly Work
- Fast Food Restaurant Work
- Running Copies and Mail Room
- Lawn and Garden Work
- Recycling Plant/Warehouse
- Stocking Shelves
- Inventory Control
- Handcrafts
Evaluation of Treatments

- Risk versus Benefit –
  Too many drugs given to young children
- Cost versus Benefit
- Evidence of Effectiveness
Principles of Using Medication

√ Try **one thing** at a time

√ A medication should have an obvious **beneficial effect**

√ Withdraw a medication **slowly**, if a person has been on it a long time

√ Be **careful switching** brands

√ Don’t expect **100% control** of a symptom
Do Not Overgeneralize When Troubleshooting Behavior Problems

☐ Is it **biological**?
  • Sensory over sensitivity
  • Hidden painful medical problem
  • Difficulty processing rapid information
  • Cannot remember long strings of verbal instruction

☐ Is it **behavioral**?
  • Frustration because cannot communicate
  • Get attention
  • Escape from a task
Hidden Painful Medical Problems in Non-Verbal Individuals That Can Cause SEVERE Behavior Problems

- Acid Reflux heartburn (most common). Not always obvious.
- Constipation
- Urinary tract infection
- Yeast infection
- Ear infection
- Bad tooth
- H pylori (stomach, ulcer bug)
Special diets work for some individuals

Vitamins and supplements B6 and Magnesium

Vigorous exercise for calming

Weighted blanket or vest for calming

Omega 3 supplements help the brain

Poor diet – more depression
# SSRI’S Antidepressants

Work really well for anxiety and panic attacks

<table>
<thead>
<tr>
<th>Drug</th>
<th>Generic Name</th>
</tr>
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<tbody>
<tr>
<td>Prozac</td>
<td>(fluoxetine)</td>
</tr>
<tr>
<td>Zoloft</td>
<td>(sertraline)</td>
</tr>
<tr>
<td>Celexa</td>
<td>(citalopram)</td>
</tr>
<tr>
<td>Lexapro</td>
<td>(escitalopram)</td>
</tr>
<tr>
<td>Paxil</td>
<td>(paroxetine)</td>
</tr>
</tbody>
</table>
Atypical Anti-Psychotics
May have severe side effects

- **Risperdal** (risperdone)
- **Geodon** (ziprasidone)
- **Zyprexa** (olanzapine)
- **Abilify** (aripiprazole)
- **Seroquel** (quetiapine)
Low Dose Principle

Some individuals on the autism spectrum need only $\frac{1}{4}$ to $\frac{1}{2}$ of the normal starting dose of drugs in these 3 classes:

- **SSRI Antidepressants**
- **Tricyclic Antidepressants**
- **Atypical Antipsychotics**

Too much causes insomnia, agitation and irritability. Other drugs usually require normal doses. If used in small children, micro doses – 1/10 of mg of Rispordal.
Blood Pressure Medications Reduce Anxiety and Are Used as Sleep Aids

Much Safer than Atypicals

- Beta blocker propranolol
- Clonidine
Anti-Convulsant Drugs for Aggression and Mood Stabilization

- Depakote
- Lamitel (lamotrigine)
- Topamax (topiramate)
ADHD Drugs and Autism

- Stimulants tend to make classical autism worse
- Stimulants sometimes help individuals with mild Asperger’s
Look Up All Drug Interactions

- Prescription drugs
- Non-prescription drugs
- Herbal supplements
Traits in Close Relatives

Four Generations of Bankers

MIT-Trained Engineer/Co-Inventor Auto Pilot

Anxiety

Depression

Visual Thinking Skills – Artist, Home Decorators

Food Allergies

Intellectual Giftedness – Writing English Literature

Asperger Traits
Asperger’s and Self-Esteem

Insight and Hope Through Famous Role Models

Norm Ledgin

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http://www.equinescience.colostate.edu
Books by Temple Grandin

- Thinking in Pictures
- Developing Talents
- Animals in Translation
- Unwritten Social Rules
- Emergence Labeled Autistic
- The Way I See It, 2nd Edition
- Animals Make Us Human
- The Autistic Brain