Autism, Animals, and Sensory Based Thinking
2nd Edition

Temple Grandin
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To understand animals, autism, art, and mathematics requires getting away from verbal language.
An animal’s world is sensory based. Their memories are sights, sounds, taste, and touch.
Van Gogh’s Starry Night
Eddies in the sky match Kolmogorov Statistical model of turbulence

Jose Luis Aragon and Manuel Torres, 2006
In humans, language covers up sensory based thinking

Miller et al., 1998, *Neurology* 51:978
In autism, details are attended to instead of whole Gestalts

- Autism faster response time to small letters
- Attend to details of faces instead of the whole

Behrmann et al., *Neuropsychologia*, 2005
A brain scan showed that normal people ignore details.

To understand animals, you need to train yourself to attend to the details.

Dr. Nancy Minshew, University of Pittsburgh
Animals may refuse to move toward a waving flag

Most people fail to see the problem caused by the flag
Cattle avoiding a streak of light
Cattle can see people through the open sides

To find distractions: Get in the chute to see it from the animal’s point of view
Animals also “watch” with their ears for potential danger

The horse has an ear pointed at both the photographer and the zebra.
I see movies in my imagination and this helped me understand animals.

Little Rainman by Karen Simmons
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
Third category under steeples
Famous Steeples
Westminster Abbey
Visual Thinking has been a huge asset in my career designing livestock facilities.
Aerial view of cattle handling facility
Hand drawn drawings for one of my early projects
The curved facility consists of three half circles positioned on a layout line.
Basic curved facility design
Common Perceptual Mistakes

1. Radius point of a circle is in the wrong place

2. 25 feet long gates

3. Uneven alley width on a curved alley

4. Gates swing wrong
Drawing in perspective by a 9-year-old child with autism. Most children do not have this innate ability.
I have a huge “internet” trunk line for graphics

Control

Temple Grandin
Pattern Thinking Mind for Extreme Origami, Computer Programming, and Engineering

Robert Lang, 2006
Types of Thinking

1. Photo Realistic Visual Thinkers - poor at Algebra
2. Pattern Thinkers – music and math
3. Verbal Mind – poor at drawing
4. Auditory Thinkers – poor at drawing
Both animals and people with autism can form sensory based categories.
On the leash and off the leash – two different categories
Cattle perceive a man on a horse and a man on foot as two different things.

They need to be habituated to both.
Both animals and people with autism are **bottom up** thinkers instead of **top down**
I had to learn concepts by putting many different specific examples in different “file folders” in my mind. There is a file folder for each concept.
Teach concepts with many specific examples

• Kite is up in the air
• Walk up the stairs
• Walk up a hill
• Go up into the attic
• Lift up a cup
Teaching Math Concepts

- Count many different kinds of objects to teach number concept
- Use many different objects and liquids to teach less and more
This horse is afraid of black cowboy hats because he was abused by a person wearing a black hat.

White hats cause no reaction. Animal fears are very specific.
The world needs different kinds of minds to work together.
I want you to think about different kinds of minds...
We need to help students who have unique minds to be successful
Mentors are Essential!!

My science teacher motivated me to study

More science teachers are needed
It is a shame that many schools have taken out hands-on classes where the student with a different kind of mind can excel.
Give these different minds an opportunity
Hire and mentor them
Art class was my salvation in elementary school. Carpentry and horses saved me in high school.
Sensory processing disorder occurs with many other disorders (co-morbid)

- Autism spectrum
- Dyslexia
- Learning problems
- ADHD
- Aspergers
- Head injury
- Oppositional defiant
- Many others
The student may block their ears because certain sounds hurt.

_Little Rainman_ by Karen Simmons
Attention shifting slowness occurs with many disorders

Takes longer to shift back and forth between two different things

Multi-tasking impossible
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.
Books by Temple Grandin

Thinking in Pictures
Developing Talents
Animals in Translation
Animals Make Us Human
The Way I See It
www.grandin.com