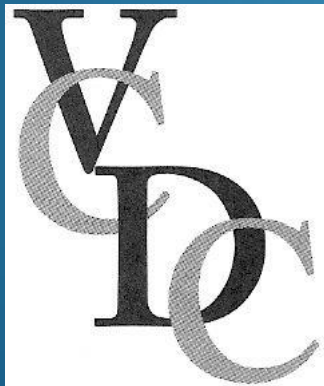


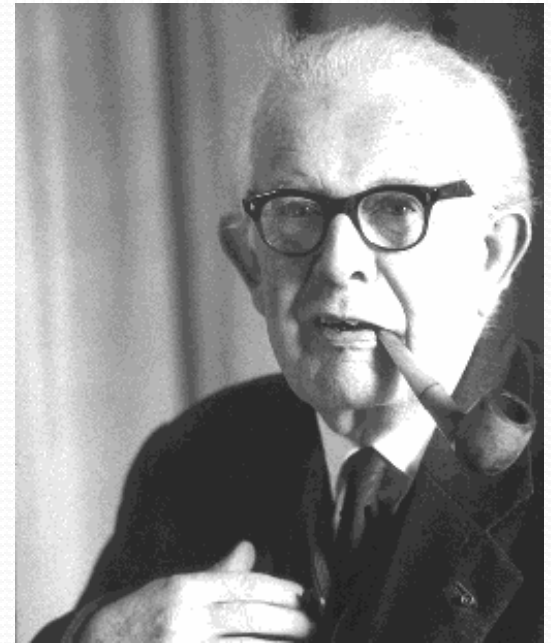
The Neurological Implications of Piagetian Vision Therapy

Dr. Mehrnaz D. Azimi Green
Skeffington Symposium
January 2010



Piaget's Theory of Development of Intelligence

- Meaningful Experience
 - Prior knowledge
 - Physiological maturation
 - Desire
- Scheme is created
 - Unit of intelligence
 - Number of schemes possessed is one's intelligence in that aspect



Visuo-Cognitive Therapy is:

- Presented at an appropriate developmental level
- Presented in a way that is meaningful and interesting to the patient
- Tailored to meet the child's unique needs

A Good Visuo-Cognitive Therapist

is:

- Flexible in terms of setting and presentation
- Empathetic, perceptive, and patient
- Quick thinking, dynamic, and fun!

"I am willing to guarantee that you will not read a more important
and useful book in 2009, or any other year."

—TOM PETERS, coauthor of *In Search of Excellence*

THE



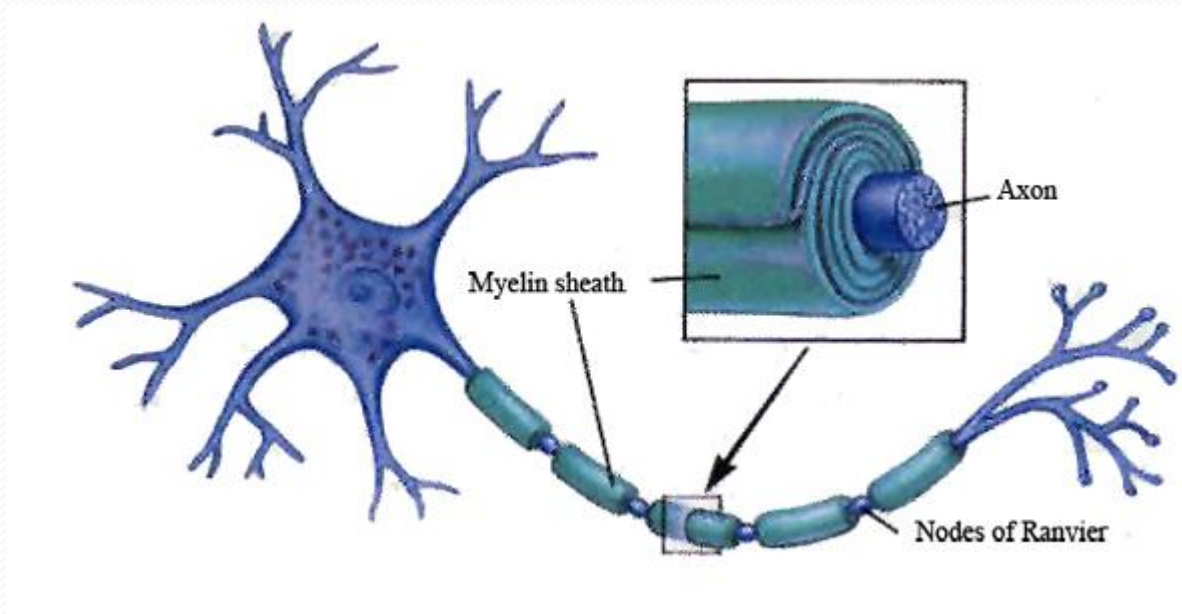
CODE

GREATNESS ISN'T BORN.
IT'S GROWN. HERE'S HOW.

DANIEL COYLE

author of the *New York Times* bestseller *Lance Armstrong's War*

Myelin



White Matter Matters

- White matter, long thought to be passive tissue, actively affects how the brain learns and dysfunctions
- Although gray matter (composed of neurons) does the brain's thinking and calculating, white matter (composed of myelin-coated axons) controls the signals that neurons share, coordinating how well brain regions work together

Mechanism of Myelin

- “Supporter cells called oligodendrocytes and astrocytes sense the nerve firing and respond by wrapping more myelin on the fiber that fires.”
- “The more the nerve fires, the more myelin wraps around it.”
- “The more myelin that wraps around it, the faster the signals travel, increasing velocities up to one hundred times over signals sent through uninsulated fibers.”

Myelin-the Holy Grail of Acquiring a Skill

- When we fire our circuits in the right way, myelin is added
- Thicker myelin, more insulation, leads to faster and more accurate movements and thoughts
- Myelin is developed efficiently through “Deep Practice”

Lets Try a Test

A

- Ocean/Breeze
- Leaf/Tree
- Sweet/Sour
- Movie/Actress
- Gasoline/Engine
- High School/College

B

- Bread/Bu_tter
- Music/L_rics
- Sh_e/Sock
- Phone/Bo_k
- Chi_s/Salsa
- Pen_il/Paper



From Which Column Do You Recall
More Words?

From Which Column Do You Recall More Words?

- Studies show we will remember three times as many on the B side
- Why?
- Stop, stumble (ever so briefly), then figure it out
- We did not practice harder on the B side, we practiced deeper

Deep Practice

- “...struggling in certain targeted ways-operating at the edges of your ability, where you make mistakes-makes you smarter.”
- “...experiences where you are forced to slow down, make errors, and correct them...”

Ignition

- Motivation created and sustained
- Ignition supplies energy for Deep Practice
- Ignition and Deep Practice work together to produce a skill

Ignition & Coaches

- Ignition comes from the person, but a master coach gets and keeps their students “in the zone”
- Coaches help get their students to the sweet spot on the edge of each person’s abilities and help them reach towards the right goals
- Coaches also facilitate self-correction by encouraging (in a variety of different ways depending on the student) to slow down and practice deeply

Tailoring VT for Z -Initial exam

- 4 y.o.
- ASD diagnosis since 2 yo
- “Always Tantrums”
- “In her own world”
- “Looks through people and objects-not at them”
- “Left eye turns out”
- PT, OT, Speech, Floortime since 2 yo
- DFE with OMD six months ago-Oc Heath-WNL

Tailoring VT for Z -Initial exam

- 25- 30 prism diopters intermittent exotropia D&N OS
- Inadequate: fixation, tracking, convergence
- Could not match two blocks
- Sustained primitive reflexes: head-righting (not developed), ATNR, STNR, SPG
- Easily visually overwhelmed, even when engaged

Tailoring VT for Z -Initial exam

- Receptive and Expressive Communication- diagnosed by SLP at 18 mo. old level
- Farsi and English-switches back and forth
- Receptive: extremely inadequate. Difficult to know if she does not understand Vs. does not want to listen
- Expressive: only able to give basic statements
- Says “you want” when she wants something. Not sure if she is confused with pronouns or wants to hear you ask her

Tailoring VT for Z -Initial exam

- Lots of crying
- Lots of screaming

- PROGNOSIS:
 - Guarded

- RECOMMENDATIONS:
 - VT in-office and at home
 - Program General Cognitive Movement and Ocular Sensorimotor initially
 - Monitor frequently with progress evaluations

Z's VT Notes

- “Tantrum”, “more crying”, “not interested”
- 3rd visit: “30 minutes before tantrum”
- 5th visit: “minimal screaming” “no tantrum”

Progress Evaluation-7th Visit

- Alternate occlusion activities: pen stab, beading
- She's in the zone!
 - Making mistakes, trying again and again, then getting it!
 - I'm pushing her
 - SHE IS PUSHING HERSELF!

Progress Evaluation

- Movement-Silhouette
 - Likes the idea of it
 - Excited to try
 - Begins and sees how difficult it is
 - I start to loose her
- “do you want something sweet and delicious to eat?” -in Farsi

Progress Evaluation

- “do you want something sweet and delicious to eat?”
- Changed gears and tailored the therapy to what she needs now
- No longer focused on silhouette-now trying to get her to express herself logically

Progress Evaluation

- Shocked I wasn't giving her a break
- Started to get louder and screaming
- I began using more gestures and more exaggerated tone of voice

Progress Evaluation

- “No! Not you. I want it!”
- Where do we get it? “mom” POINTS to waiting area!

Coached Z to Practice Deeper

- Did I know she wanted to stop the activity?
 - YES – but I was not going to allow her to revert back to lower level thinking
 - Pushed her to break through and express herself logically
 - Then do it again and again and again – myelinating the pathway

Coached Z to Practice Deeper

- I was lucky, I spoke Farsi
- Pushed her to break through the communication barrier and express herself logically
- Now we knew she could do it (and so did she)
- Required to express herself logically again and again by her therapists

Z Still Growing: VT Notes

- “Good day”, “very flexible”, “no tantrums”
- Much more aware of her surroundings- “Look at that! It’s pink”
- Able to follow verbal schedule rather than picture cards
 - ex. “First this, then that”

Z Still Growing: Parents are Happy

- In a good school for kids with ASD that would not have been able to accept her if she was still screaming/tantruming and poor communication abilities
 - More observant
 - Better eye contact
 - No longer has the eye turn
 - Able to make social and emotional connections to peers

Z Still Growing

- We are happy because she is filling her intellectual gaps and delays
- Z is proud of herself

Z Still Growing: Everyone has Good Days and Bad Days

- “STRIPPED! Water on shirt, so took off clothing, tantrum ,etc.”



Conclusions: I Believe...

- Vision therapy is a type of “Deep Practice”
- VT develops neuropathways
- Repeating the activity until the knowledge is internalized and the skill is habitual myelinates those pathways
- Further research should be done regarding VT’s role in brain development and rehabilitation

Questions/Comments?

