• EXECUTIVE FUNCTIONS AND ORCHIDS

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DISCLOSURE #1

I have no relevant financial relationships with commercial interests in any proprietary entity producing, marketing, re-selling or distributing health care goods or services consumed by or used on patients.
DISCLOSURE #2

I am not from around here.
MAPLE SYRUP

I’D TAP THAT
THE HUMAN BRAIN

- Balance
- Sensation
- Emotion
- Skill
- Speech
- Vision
THE AVERAGE NUMBER OF BRAIN CELLS IN A HUMAN BRAIN

- 86,000,000,000
- 86,000 MILLION
- 215,000 WOODSTOCKS
- 258 USA’s
How many synapses per typical neuron?
There are 1000 to 10,000 synapses per "typical " neuron
BRAIN CIRCUITS

- **executive control loop**
  - Outcome monitoring
  - Action selection

- **reward loop**
  - Outcome valuation
  - Affective valuation
Neurodevelopmental Disorders DSM—V, 2013

- Intellectual Developmental Disorders
- Communication Disorders
- Autism Spectrum Disorders
- Attention Deficit/Hyperactive Disorders
- Learning Disorders
- Motor Disorders
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Phineas Gage
EXAMPLES OF EXECUTIVE FUNCTION

• **IMPULSE INHIBITION**  **IMPULSE CONTROL**

• Impulse control.......Think before you act
• The ability to inhibit (stop or delay) one’s initial response
• The ability to inhibit what you’d like to do so you can do what you should do
DISTRACTION INHIBITION  ATTENTION SKILLS

• The ability to pay attention to the appropriate task
• Resist being distracted by internal thoughts (day dreaming)
• Resist being distracted by activities going on around you
• The ability to maintain focus / stay on task (Attention span)
• The ability to focus on what is important or relevant
SHIFTING

• *THE ABILITY TO SHIFT BETWEEN THOUGHTS OR ACTIVITIES
• *THE ABILITY TO DEAL WITH CHANGE
  • Problems changing or transitioning to new thoughts or activities
  • “Gets stuck” -- “Can’t let go” -- “Hyper focused”-- “Perseverates”
    Prefers routines Perform repeated rituals
  • Difficulty changing behavior even if it’s not working
  • Super stubborn “My way or the Highway “ I’ll do it my way (Frank Sinatra Syndrome)
SELF-REGULATION OF MOTIVATION  
*Perform Non-preferred Tasks*

*Delayed Gratification Skills*

- Be able to concentrate on tasks that are boring or have rewards that aren’t immediate
- Be able to work toward long term goals
- Be able to perform a task even if it is not interesting, don’t like it, or not good at it (Saliency)
- Be able to SELF-MOTIVATE / Delay Gratification
SELF REGULATION OF MOTIVATION

• PERFORM NON-PREFERRED TASKS
• DELAY GRATIFICATION
• SELF MOTIVATE TO DO NON-PREFERRED TASKS
META COGNITION / SELF AWARENESS

• ABILITY TO OBSERVE ONES SELF / ANALYZE HOW ONE IS FEELING AND BEHAVING

• SELF MONITOR

• BE AWARE OF ONE’S EFFECTS ON OTHERS
Working Memory

– Temporary storage and use of information, ability to take in, temporarily store information and then use that information to perform one or more tasks

– **BIG BUCKET** versus **THIMBLE**

– **Nonverbal Working Memory** - internal sense of time (wait a minute....) time management
NEURODEVELOPMENTAL DISORDER TREATMENT OPTIONS

• 1. Wait and pray
• 2. Promote Cognitive Skills
• 3. Teach the Adaptive Behavior/Skill (Replace the maladaptive with the adaptive)
• 4. Modify the environment /Modify expectations
• 5. Chemistry Experiment (Neurotransmitter Manipulation)
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   SPECIALIZED INSTRUCTION EXAMPLE: ABA THERAPY

4. Modify the environment /Modify expectations

5. Chemistry Experiment (Neurotransmitter Manipulation)
   OTHER MANIPULATION
NEURODEVELOPMENTAL DISORDER TREATMENT OPTIONS

1. Wait and pray  
   **BRAIN DEVELOPMENT**

2. Promote Cognitive Skills  
   **HEALTHY LIVING**

3. Teach the Adaptive Behavior/Skill (Replace the maladaptive with the adaptive)  
   **SPECIALIZED INSTRUCTION**  
   **EXAMPLE:**  **ABA THERAPY**

4. Modify the environment /Modify expectations  
   **BUILD A BETTER GREENHOUSE**

5. Chemistry Experiment (Neurotransmitter Manipulation)  
   **? OTHER MANIPULATION**
Developmental / Behavioral Pediatrics is the identification and cultivation of Orchids

- David Dobbs
- The Science of Success
- The Atlantic Monthly, 2009
Most of us are dandelions—adaptable, hardy, resilient—can grow pretty much anywhere.

Some of us are orchids—fickle, fragile, very susceptible to environment—need a very specific environment in which to thrive.
GENETIC VULNERABILITY VERSUS
“Orchid Hypothesis” (Plasticity Hypothesis, Sensitivity Hypothesis, Differential-Susceptibility Hypothesis)
INDIVIDUALS WITH AUTISM NEURODEVELOPMENTAL DISORDERS ARE ORCHIDS.

ORCHIDS REQUIRE A SPECIALIZED GREEN HOUSE
ORCHIDS REQUIRE A SPECIALIZED GREEN HOUSE

FAIR IS NOT EQUAL...FAIR IS EVERY ONE GETS WHAT THEY NEED
The reason human species is successful - orchids
If in the right environment …not only succeed and thrive …

THEY HAVE THE POTENTIAL TO EXCEL
NOTHING IS WRITTEN IN STONE