Sledding, LIKES, and Sharks: Strategies for Teaching the Teenage Brain!

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Objectives
By the end of the presentation, the participants will be able to:

• Explain how teen development affects decision-making, risk-taking, and attention.
• Describe three factors of teen brain development that must be considered when teaching or working with this group.
• Discuss three teaching techniques or strategies that can be used to engage teens most effectively in critical thinking.
Different Generation, Different World, Different Needs

- Too much, too fast
- Grammar – language
- Tired
- Attention span
- How they learn
Like fingerprints or snowflakes, no two brains are the same! There is no “one size fits all”!
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But there are similarities…

- Developmental rates
- Experiences
- Information Storage
ANATOMY OF A TEENAGER’S BRAIN

THE BIRDS AND THE BEES LOBE

MEMORY FOR MUSIC

LOVE FOR PARENTS

ALL THE ANSWERS

SLANG DECODER

JUDGEMENT GLAND

MEMORY FOR CHORES, HOMEWORK, ETC.

“COOL” GAUGE

CENTER OF UNIVERSE

“SELF” IMAGE

FITTING-IN GLAND

EVERY EPISODE OF THE SIMPSONS

INDESTROYIBILITY CORTEX

SLAM DOOR REFLEX

CAR KEYS CRAVING

ABILITY TO BE SEEN IN PUBLIC WITH PARENTS

PRONE TO BRUSHING

PEER PRESSURE RESISTANCE

FRIENDS, ADDICTIONS

MARK PARISI @ AOL.COM
Brain Development
Gray/White Matter & Frontal Lobe Development

- **Gray** $\rightarrow$ neurons (nerve cells)

- **White** $\rightarrow$ connective wiring

- Adolescents overabundance gray and undersupply white
Adolescent Loss of Gray Matter

(Powell, 2006)
Brain Development

Gray/White Matter & Frontal Lobe Development

- Develops from back to front

- Frontal lobes
  - Executive function, judgment, insight, impulse control
  - More than 40% brain’s total volume! (Jensen & Nutt, 2015)

Prefrontal Cortex (PFC)

- Teen brain 80% mature, 20% PFC (Jensen & Nutt, 2015)
  - Ability to initiate and carry out new and goal-directed patterns of behavior
  - Sustained attention
  - Motor attention
  - Working memory
  - Planning
  - Sequencing tasks
  - Flexibility
  - Active problem solving
  - Linked to emotional regulation

(Siddiqui, S., Chatterjee, Kumar, Siddiqui, A., & Goyal, 2008)
Judgment last to develop

The area of the brain that controls “executive functions” — including weighing long-term consequences and controlling impulses — is among the last to fully mature. Brain development from childhood to adulthood:

5-year-old brain  Preteen brain  Teen brain  20-year-old brain

Dorsal lateral prefrontal cortex (“executive functions”)

Red/yellow: Parts of brain less fully mature

Blue/purple: Parts of brain more fully mature

Sources: National Institute of Mental Health; Paul Thompson, Ph.D., UCLA Laboratory of Neuro Imaging

Thomas McKay | The Denver Post
Powerful and Vulnerable

- Efficient learners
- Cognitively flexible
- Supercharged hippocampus
- Faster learning curve

- Eliminating gray matter
- Slower connection to frontal lobes
- Less efficient attention, self-discipline, task completion
- Less ability process negative info
Make those paths! Make them deep!

• Use it or lose it! Unused, weak connections, elimination of weakest gray; more activity between neurons, the stronger the synapse (connection) 
  (Jensen & Nutt, 2015; Medina, 2008)
• FREQUENCY and RECENCY (Jensen & Nutt, 2015)
  • Short-term memory - Repeat to remember!
  • Long-term memory – Remember to repeat!
  • Vary “door handles” to learning
  • Forgetting – update status
Retaining through Repetition

- Deliberately re-expose to retrieve later
- Deliberately re-expose elaborately for higher quality retrieval
- Deliberately re-expose elaborately and in fixed, spaced intervals for the most vivid retrieval
STRATEGIES

• Repeat differently – new “handles”

• Get creative
  • Songs
  • Movement
What is 5 + 10?

- A) 15 (clap your hands)
- B) 20 (stomp your feet)
- C) 50 (stand up)
Musical Chairs Review

- Paper at every desk numbered as many questions as you would like (preferably less than 10)
- Walk around room while play music
- When music stops, go to closest desk
- Teacher asks a question while students write
- Play music and walk around again until music stops and repeat!
Review Walks and Games

- Take a walk with students and ask questions
- Get outside if weather permits!
- Games to review not just before tests
- Have students come up with games too!
- Technology – Kahoot!
Give meaning! Relate!

- Sense and meaning (Sousa, 2011)
- Appeal to senses, especially vision (Medina, 2008)
- Peer influence
- Remain relevant and current!
- Repeat real-life examples - MEANING! Expands ability to retain info.

(Sousa, 2011)
STRATEGIES

- Images
- Videos (shorter clips)
- Stories
- Placement/Imagery
- Association
- Auditory/Visual/Kinesthetic
- Discussion boards and interaction

“THERE’S NOTHING WRONG WITH YOUR IPOD, DAD. IT’S JUST TOO EMBARRASSED TO PLAY THE KIND OF MUSIC YOU LIKE!”
http://www.glasbergen.com/?count=2&s=teens
Pictures

N + 4s +

Motor
Jewelry
Candy
Hi my name is…

1800 Bannister St.
York, PA 17404

867-5309

2016 Honda Civic

Color

Owner
Placement and Imagery

- Cherries
- Green Beans
- Chicken
- Walnuts
- Pasta noodles
- Orange Juice
- Bagels
- Grapes
Placement and Imagery

- Hair
- Mouth
- Neck/Chest
- Armpits
- Stomach
- Backside
- Knees
- Feet
Imagery

- Cherries (rolling in your hair)
- Green Beans (making mustache)
- Chicken (pecking at your neck)
- Walnuts (crushing in your armpits)
- Pasta (noodles like a belt)
- Orange Juice (sitting in it)
- Bagels (on your kneecaps)
- Grapes (smashing with your feet)
Imagery
Placement and Imagery

- Cherries
- Green Beans
- Chicken
- Walnuts
- Pasta noodles
- Orange Juice
- Bagels
- Grapes
Association

Meaning through transfer - write the first two words that come to mind next to each word.

- Cherries
- Green Beans
- Chicken
- Walnuts
- Pasta noodles
- Orange Juice
- Bagels
- Grapes
Attention!

How things have changed
Look over here!

- Novelty!!! Incoming information compared with previous knowledge, information that matches considered redundant and discarded (valuable brain space) (Jensen & Nutt, 2015)
  - Brain programmed to pay special attention to new information (Sousa, 2011)
  - Think like a marketing professional – unusual, unpredictable, distinctive (Medina, 2008)

- Emotions – higher priority than cognitive processing for commanding attention (Sousa, 2011)
Look over here!

• MEANING before details (Medina, 2008)

• Primacy-Regency Effect (Medina, 2008)

• KISS principle – one or two things, also not multitasking (Jensen & Nutt, 2015)
  • Not enough time to “connect the dots” (Sousa, 2011)
STRATEGIES

- Use emotion
- Primacy-regency – new material at the beginning, after breaks, and end
- Chunking information (creating more beginnings and ends)
- Meaning first
- Few instructions, details, or concepts at once (KISS)
- Go off-task and give breaks!
- Humor
Chunking

The apple is red.
(16 items - 13 letters and 3 spaces)

DNA NBC TV FBI USA

Easier?
You likely learned the alphabet in chunks!
Brain Breaks

Mary had a little lamb…

- Stand or sit every time you hear the letter “l”

- Add a clap every time you hear the letter “m”
Brain Breaks

Carbohydrate – jumping jack
Protein – make muscle
Fat – hug yourself

Provide energy
Sleep

• Just one hour less weekday sleep among adolescents $\rightarrow$ greater odds of feeling hopeless, suicide attempts, and substance abuse (Winsler et al., 2015)

• Melatonin released at different times than adults

• “Sleeping on it” (Medina, 2008)
CIRCADIAN RHYTHMS

The Psychological/Cognitive Cycle

Degree of Focus

6AM  8AM  10AM  12N  2PM  4PM  6PM  8PM  10PM

Time of Day

Pre/postadolescent

Adolescent

(Sousa, 2011)
Stress

- Lower stress tolerance (amygdala in teens, PFC adults)
- Adults can rely on PFC to control extreme emotions
- Anxiety modulating hormone different effect on teens
- When fearful, higher amygdala activation than adults
- Opportunity for resilience – learned, so better equipped than adults to learn how to positively respond

(Jensen & Nutt, 2015)
STRATEGIES

• Push for later school starts, at home - ban device use two hours before bed
• Breaks
• Things are “a big deal” – listen
• Healthy ways to cope
• Ability to weigh costs and benefits less developed – lack ability to delay gratification and see far-reaching consequences → so focus on more immediate and tangible consequences, also avoid “because I said so” (Herman, 2005)
Thank you for your attention!

Questions? Comments? Feedback?
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References


