Survive or Thrive: Using Lessons from Neuroscience to Re-envision Adolescent Success

Stephanie Guinosso, PhD, MPH  Vignetta Charles, PhD
Project Director, CSHA  Chief Science Officer, ETR
sguinosso@schoolhealthcenters.org  vignetta.charles@etr.org

Webinar presented for CSHA September 7, 2016
Our Journey Today

Lessons from Neuroscience

Motivation & Self-Regulation
Learning Objectives

• Summarize latest findings in adolescent neurodevelopment;
• Describe the social and affective processes that underlie adolescent behavior; and
• Apply key findings from developmental neuroscience to our current work with adolescents.
Brain Warm-Up!

The part of the brain that is last to develop is the P________ F_________ C___________.

T/F Adolescents are less rational than adults.
Key Lessons from Neuroscience

1. Neuroplasticity shapes the brain
2. Brain regions mature at different times
3. Plasticity is shaped by experience
#1: Neuroplasticity shapes the brain
Use it or Lose It! Or... Use it to Improve It!

Source: Corel, JL. The postnatal development of the human cerebral cortex. Cambridge, MA: Harvard University Press; 1975
Use it or Lose It! Or... Use it to Improve It!

(Giedd, 1999)
#2: Brain regions mature at different times.

(Casey, 2008)
Limbic System = Survival

Limbic System
• Motivation
• Emotion
• Memory
• Learning

Source: Community Resilience Cookbook
PFC = Complex Cognitive Skills

Prefrontal Cortex
• Thinking
• Planning
• Impulse Control
• Emotional Regulation
• Attention

Source: Community Resilience Cookbook
Prefrontal Cortex

Adolescence

Casey, 2011
B

Nucleus Accumbens

Prefrontal Cortex

Adolescence

Age

Functional Development

(Casey, 2011)
B

Functional Development

Age

Adolescence

(Casey, 2011)
Hot vs. Cold Cognition

- Affective arousal, time pressure, social pressure
- Non-pressured, “ideal” conditions
#3: Plasticity is shaped by experience
Gradual development of cognitive control, depends on context

Increase in sensation-seeking, novelty-seeking, and motivational salience of peers in adolescence

Positive Growth Trajectories
- adaptive exploration,
- social competence,
- long-term goals

Negative Growth Trajectories
- diminished goals, or motivation towards negative goals,
- excessive risk-taking

(Crone & Dahl, 2014)
Survival Mode: Flight/Fight/Freeze

Prefrontal Cortex
- Thinking
- Planning
- Impulse Control
- Emotional Regulation
- Attention

Limbic System
- Motivation
- Emotion
- Memory

Amygdala
- Fight, flight, or freeze;
- Emotionally-charged memories

Hippocampus
- Short-term memory

Source: Community Resilience Cookbook
<table>
<thead>
<tr>
<th>RED</th>
<th>GREEN</th>
<th>BLUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORANGE</td>
<td>BLUE</td>
<td>GREEN</td>
</tr>
<tr>
<td>GREEN</td>
<td>YELLOW</td>
<td>ORANGE</td>
</tr>
<tr>
<td>BROWN</td>
<td>RED</td>
<td>BLUE</td>
</tr>
<tr>
<td>PINK</td>
<td>YELLOW</td>
<td>GREEN</td>
</tr>
</tbody>
</table>
Your Plastic Brain!

Type into the chat box:
-- one new thing you learned
-- one thing that surprised you
Part II

Lessons from Neuroscience

Motivation & Self-Regulation
Motivation
Strategies for Motivation

• Know what youth find important – ignite passions!
• Provide opportunities for discovery learning
• Allow some autonomy – scaffold the risk
• Practice tolerating discomfort – failure creates opportunity for learning
• Create a positive and engaging learning environment

(Schenck, 2011)
Self-Regulation
“the voluntary regulation of attentional, emotional, and behavioral impulses when immediate temptations conflict with more enduringly valued goals”
“Between stimulus and response, there is a space. In that space lies our freedom and power to choose our response. In our response lies our growth and freedom.”

—Viktor Frankl
Benefits of Delayers

- Better grades/achievement
- More positive relationships with adults & peers
- Less cigarette, drug and alcohol use
- Better physical health
- Well-being in adulthood (income, savings & health)
Benefits of Delayers

✓ Better grades/achievement
✓ More positive relationships with adults & peers
✓ Less cigarette, drug and alcohol use
✓ Better physical health
✓ Well-being in adulthood (income, savings & health)
“Non-Cognitive” Skills

- Determination
- Persistence
- Self-regulation
- Self-confidence
Strategies to Improve Self-Control

Strategies to Reduce Strength of Impulses

(Duckworth & Steinberg, 2015)
Strategies

- Situation selection
- Situation modification
- Attentional deployment
- Cognitive change
- Response modulation

- Self-talk
- Growth mindset
- Mental contrasting (*if-then plans*)
- Physical Exercise
- Practice mindfulness*

(Duckworth, 2014)
What Are You Thinking?

Instead of...

• I’m not good at this.
• I give up.
• This is too hard.
• I can’t make this any better.
• I just can’t do math.
• I made a mistake.
• She’s so smart. I will never be that smart.
• It’s good enough.

Try thinking...

• What am I missing?
• I’ll use some of the strategies we’ve learned.
• This may take some time and effort.
• I can always improve, so I’ll keep trying.
• I’m going to train my brain.
• Mistakes help me learn.
• I’m going to figure out how she does it so I can try it.
• Is this really my best work?
Take Home Points

• Teens crave novelty and rewards, especially around peers
• Teens take risks – this is a normal part of development
• Experience shapes learning – and the brain
• Ignite passions and foster self-regulation
Any Questions
Write down one thing you learned.

Write down one thing that inspired you.

Write down one action you will take.
Thank You!

Stephanie Guinosso, PhD, MPH
Project Director, CSHA
sguinosso@schoolhealthcenters.org

Vignetta Charles, PhD
Chief Science Officer, ETR
vignetta.charles@etr.org

Webinar slides and recording will be available at http://www.schoolhealthcenters.org.
Visit www.etr.org for additional information on learning and the brain!