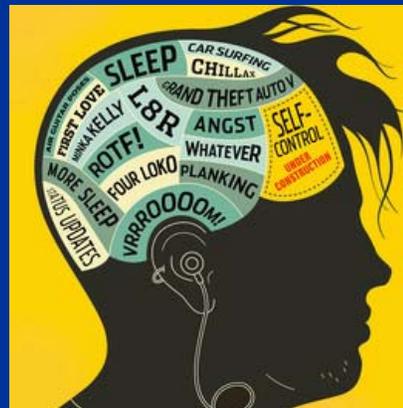


Emotion Regulation and Adolescent Substance Use: Research Findings and Implications for Interventions



Tara M. Chaplin, Ph.D.
Department of Psychology
George Mason University

Introductions

- Tara
- Audience
- Our team: does research on parent-teen relationships, emotion regulation (brain and behavior), and teen risk behaviors and are developing a parenting-focused mindfulness intervention

Contact Info

- Contact us anytime for more information!

Tara Chaplin: tchaplin@gmu.edu

Youth Emotions Lab Website: yel.gmu.edu



Today

1. Adolescent Emotion

-research on the teen brain and emotion

-links to risk behavior

2. Family Environment

3. What Can We Do?

-Interventions



Teenagers and Emotion

- Stereotype of teens as “emotional”
- Some research supports this
- Greater lability
- Higher rates of depression
- Brain changes related to emotion



What Does Research Tell Us on Teen Brains and Emotion?

- Recently, fMRI (functional magnetic resonance imaging) allows us to examine brain activity in children in a safe way (e.g., no radiation).
- fMRI machines use magnetic fields to detect changes in blood flow in areas of the brain.



What Does Research Tell Us?

- Frontline “Inside the Teenage Brain” special

<http://www.pbs.org/wgbh/pages/frontline/shows/teenbrain/view/>

-Or:

https://www.youtube.com/watch?v=Bhv3bA_qG24

What Does Research Tell Us?

1. Brain Development:

-Brains do not stop changing in childhood. They are still developing in adolescence.

-Thus, teen's experiences can shape the brain, in part by impacting what connections get pruned!

What Does Research Tell Us?

1. Brain Growth:

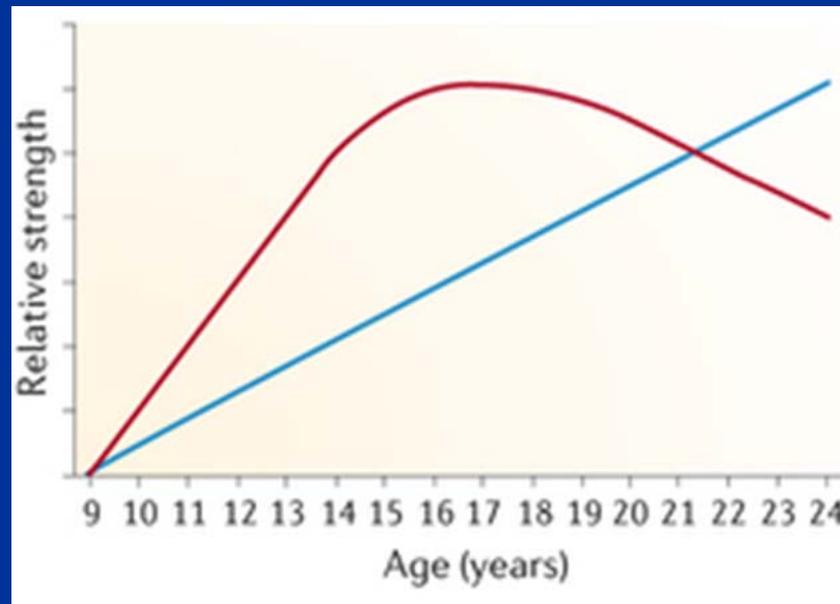
-What do you all think of the video and the idea of teen brains continuing to be shaped?

What Does Research Tell Us?

2. A Tale of Two Brain Systems

Emotion/reward (limbic)

Cognitive control (prefrontal)

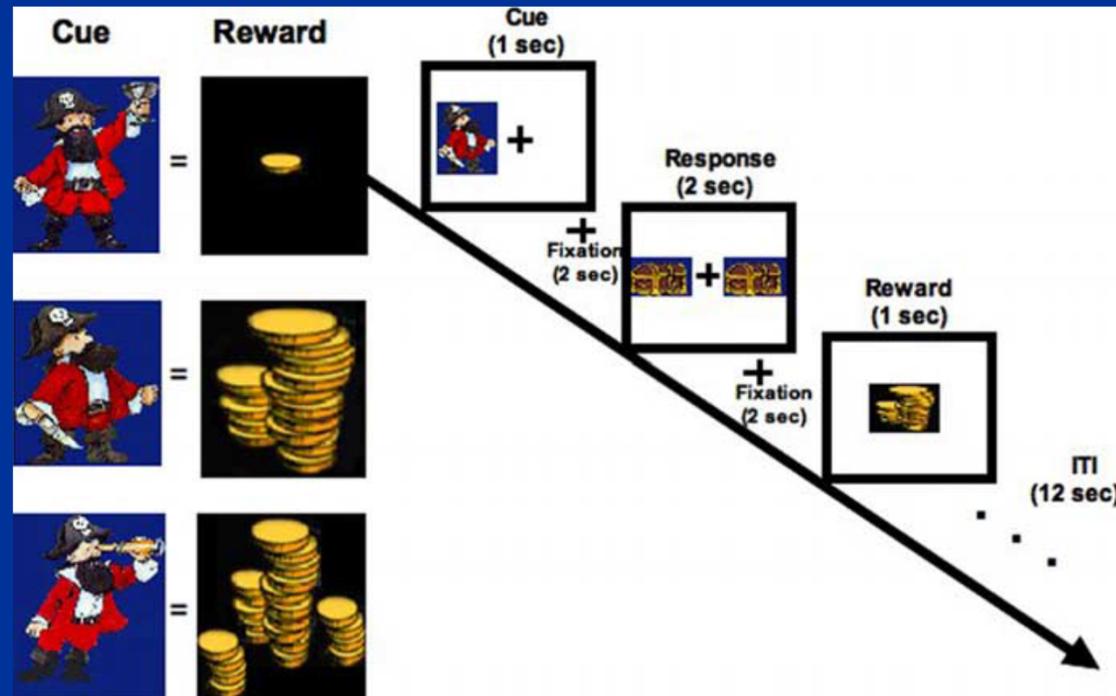


Steinberg (2013), also Steinberg (2010)

What Does Research Tell Us?

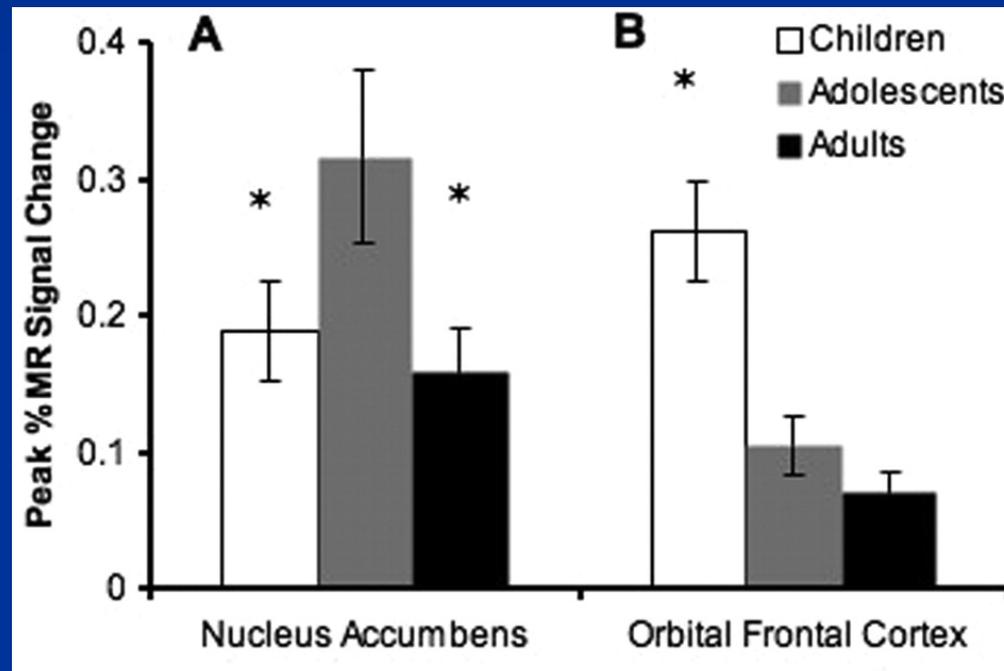
2. A Tale of Two Brain Systems

Galvan study



What Does Research Tell Us?

2. A Tale of Two Brain Systems



Galvan et al. 2006

What Does Research Tell Us?

2. A Tale of Two Brain Systems

Highly active emotion/reward systems + immature cognitive control systems = period of high emotional arousal, but low control over emotions/behaviors

-can lead to risky-taking and risky behavior.

What Does Research Tell Us?

2. A Tale of Two Brain Systems

-Do you see higher emotionality in teens in practice?

What Does Research Tell Us?

3. Effects of Peers

-Greater influence of peers/friends on taking risks and brain responses to risk-taking during adolescence

What Does Research Tell Us?

3. Effects of Peers

Chen Study, Stoplight Game



What Does Research Tell Us?

3. Effects of Peers

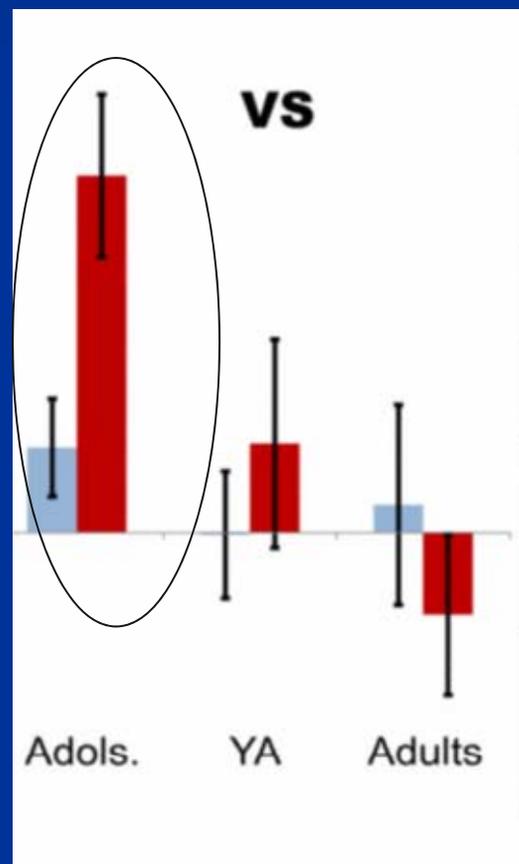
With friends there- blast through the light



What Does Research Tell Us?

3. Effects of Peers

Reward System Activation *Alone* vs *with Friends*



What Does Research Tell Us?

3. Effects of Peers

-have you noticed heightened effects of peers in the teens you work with? (particularly early adolescence)

Links To Risk Behavior

1. Adolescent brains are wired to seek out risks
(high emotion regions, low pfc, high peer input)

-Youth take more risks in terms of alcohol and drug use, risky driving, risky sexual behaviors, acting out impulsively.

-Adolescents is also a risk period for depression and other mental health issues.

Links To Risk Behavior

2. Adolescent brains are highly vulnerable.

-So, these risk behaviors can leave an imprint that lasts in the brain.

-EG, drug use during this sensitive period **MAY** lead to fairly permanent brain changes. We don't know the answer to this yet.

Links To Risk Behavior

3. Our Work: GMU Study of Teen Emotion

-We have examined links between emotion (behavior, physiology, brain) and adolescent risk behaviors in high risk and community teens.

Links To Risk Behavior

3. Our Work: GMU Study of Teen Emotion I



Links To Risk Behavior

3. Our Work: GMU Study of Teen Emotion I

-emotion reports



-physiology

*salivary alpha amylase

(SNS)



Links To Risk Behavior

3. Our Work: GMU Study of Teen Emotion I

-lower sadness responses → SU for boys

-lower sAA responses → SU for boys

Links To Risk Behavior

3. Our Work: GMU Study of Teen Emotion II



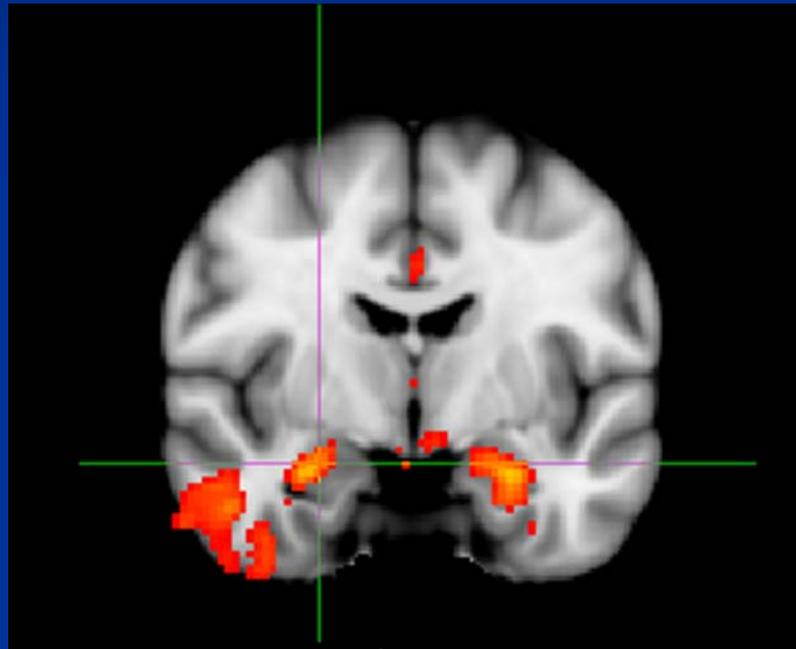
Links To Risk Behavior

3. Our Work: GMU Study of Teen Emotion II



Links To Risk Behavior

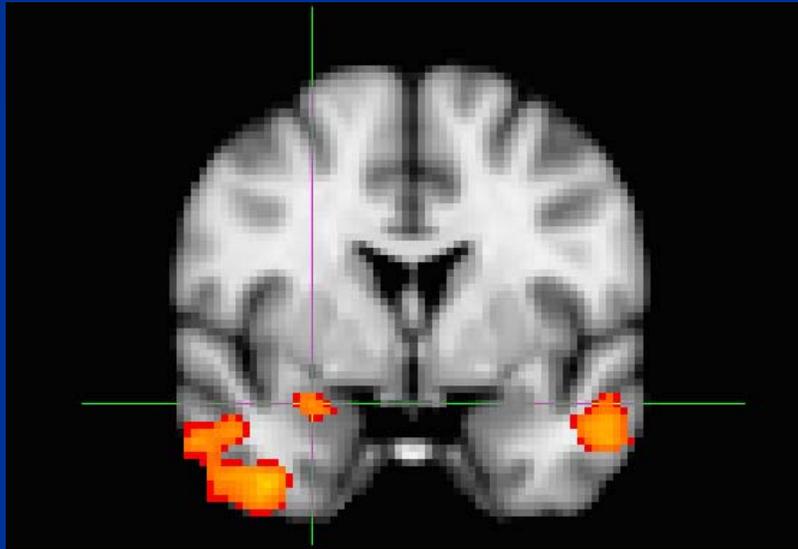
3. Our Work: GMU Study of Teen Emotion II



Teens responded to negative pictures in amygdala
(note: brain picture is averaged across 63 teens)

Links to Risk Behavior

3. Our Work: GMU Study of Teen Emotion II



Non Users



Substance Users

Links To Risk Behavior

3. Our Work: GMU fMRI Study of Teens

- Lower emotional responses (reported, physiology, brain) to emotional situations/pictures related to risk behaviors
- These youth may be *under*-aroused and seek out risk and substance use to have greater sensation.

Links To Risk Behavior

3. Our Work: GMU fMRI Study of Teens

-But... what leads to under-arousal?

Maybe family factors

Family Environment

1. Family is Important for Teen Emotion

- Adolescence: time of change in family environment.
- Parenting linked to substance use & risk behavior
- BUT, few studies of parenting and adolescent emotion-related brain function

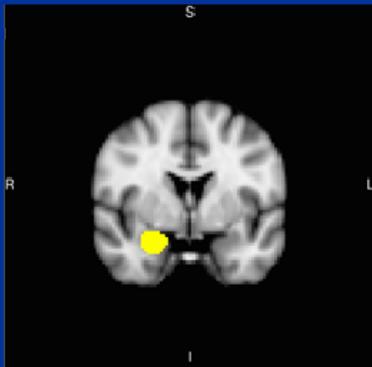
Family Environment

2. Our Work: GMU Parent-Teen Study

Family Environment

2. Our Work: GMU Parent-Teen Study

*Low Parent Warmth with Lower Youth Amygdala Response



R Amygdala mask

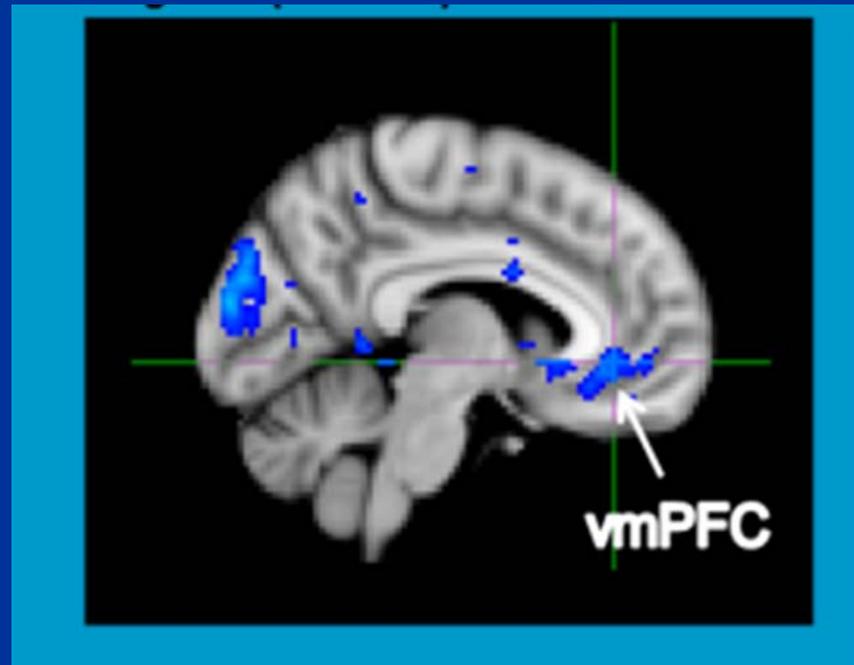
Regression: R Amygdala Neg-Neu

	β	t	p
Child Age	-0.16	-1.31	.19
Child Sex	-0.06	-0.52	.61
Child Race	0.18	1.40	.17
Low Warmth	-0.22	-1.72[†]	.09

Family Environment

2. Our Work: GMU Parent-Teen Study

*Lower Parent Warmth with Lower Adolescent
PFC Response



Family Environment

2. Our Work: GMU Parent-Teen Study

-Low parental warmth linked to lower brain responses to emotional pictures

-Same pattern of *under*-aroused youth

-Parenting → Teen Brain → Risk Behavior

What Can We Do to Help

1. Teens brains are still developing, particularly in cognitive control regions.

-May need help making decisions

-What do you think the implications might be for practice with families?

Implications for Practice

1. Remember that teen brains are still developing, particularly in cognitive control regions.

- a. May need help making decisions: Support teen by giving guidance, reminders and suggestions.
- b. Educate parents on brain development
- c. Don't label teens' poor decisions as "stupid"- they may not be able to help them.

Implications for Practice

2. Teens brains are highly emotional.

-How can you apply this to your practice with families?

Implications for Practice

2. Teens brains are highly emotional.

-It's normal for teens to have mood swings- they can't help it.

-Help educate parents to be compassionate about this if possible (warmth helps)

-Provide support to parents who are going through this!

Implications for Practice

3. Teens brains can lead to risk behaviors and poor decisions.

- Talk about potential tricky scenarios and ask them how they might handle those. (“What would you do if your friend is drinking and wants to drive you home?”)

Implications for Practice

4. Teens brains are sensitive to environmental input

-How can you apply this to your practice with families?

Implications for Practice

4. Teens brains are sensitive to environmental input

- Educate teens and parents about effects of environment and drugs on the brain in the teen years

- NIDA for Teens Website:

<http://teens.drugabuse.gov/educators/nida-teaching-guides/mind-over-matter>

Implications for Practice

5. Teens are more sensitive to peer influence on risk taking

-Be aware of this. Risk-taking will happen in emotionally-arousing situations in groups of youth.

Implications for Practice

6. Parents are still important!

-Yet, parenting is stressful for parents of teens....

Example: Parenting Mindfully Intervention

- Parenting is stressful
- Stress can compromise parenting
- Mindfulness reduces stress in adults
- Why not give mindfulness to parents?

Example: Parenting Mindfully Intervention

“Mindfulness is the practice of focusing full attention on the present moment intentionally and without judgment” (Kabat-Zinn, 1990).

Example: Parenting Mindfully Intervention

- Parenting Mindfully Program helps parents:

- Reduce reactivity and follow intentional parenting goals

- Be more 'present' in interactions with teens

- Show acceptance of child and of self as a parent

- Feel compassion toward child and self

(Duncan et al., 2009)

Example: Parenting Mindfully Intervention

- Done through meditation and discussions of applying mindfulness to parenting “moments”

Example: Parenting Mindfully Intervention

- Through mindful parenting, parenting can improve and parent-child relationship can improve, helping adolescent emotion and preventing risk behaviors.
- RCT: Initial outcomes are promising, with greater mindful parenting, compassion, more positive ratings of teens.

Summary

- Adolescents experience emotional arousal, poor regulation.
- Patterns of emotion-related brain activity are linked to risk behaviors
- Parenting is related to those same emotion-related patterns of brain activity

Summary

- Important to educate parents on teen emotional development
- Important to work with parents to reduce stress and improve parenting relationship

Thank You

- Our Sponsor: National Institutes of Health (NIH)
- Co-Investigators: James Thompson, GMU; Sarah Fischer (GMU)
- Collaborators: Linda Mayes, Rajita Sinha, Yale University School of Medicine; Laurie Chassin, Arizona State University
- Our Study Team
- Our Participating Families

Sources for Parents

-*You and your adolescent: The essential guide for ages 10-25.* (Lawrence Steinberg)

-*The Teenage Brain: A Neuroscientist's Survival Guide to Raising Adolescents and Young Adults* (Jensen & Nutt)

-NIDA for Teens: <http://teens.drugabuse.gov/educators/nida-teaching-guides/mind-over-matter>

-Frontline Special:

<http://www.pbs.org/wgbh/pages/frontline/shows/teenbrain/>

Sources

Chein, J., Albert, D., O'Brien, L., Uckert, K., & Steinberg, L. (2011). Peers increase adolescent risk taking by enhancing activity in the brain's reward circuitry. *Developmental Science*, 14(2), F1-F10.

Galvan, A., Hare, T. A., Parra, C. E., Penn, J., Voss, H., Glover, G., & Casey, B. J. (2006). Earlier development of the accumbens relative to orbitofrontal cortex might underlie risk-taking behavior in adolescents. *The Journal of Neuroscience*, 26(25), 6885-6892.

Steinberg, L. (2010). A dual systems model of adolescent risk-taking. *Developmental psychobiology*, 52, 216-224.

Also: Steinberg, L. (2010). A behavioral scientist looks at the science of adolescent brain development. *Brain and cognition*, 72(1), 160-164.

Contact Info

- Contact us anytime for more information!

Tara Chaplin: tchaplin@gmu.edu

Youth Emotions Lab Website: yel.gmu.edu