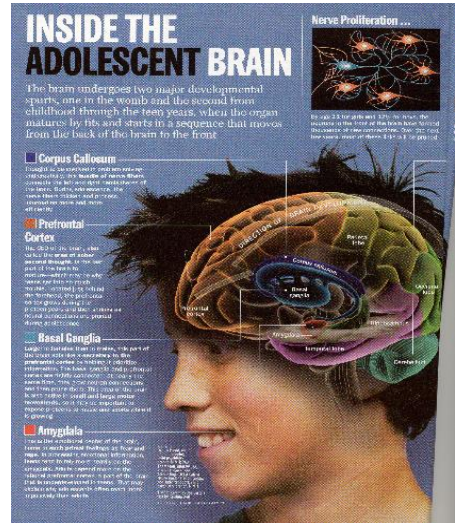


Why Do Teens Behave the Way They Do?

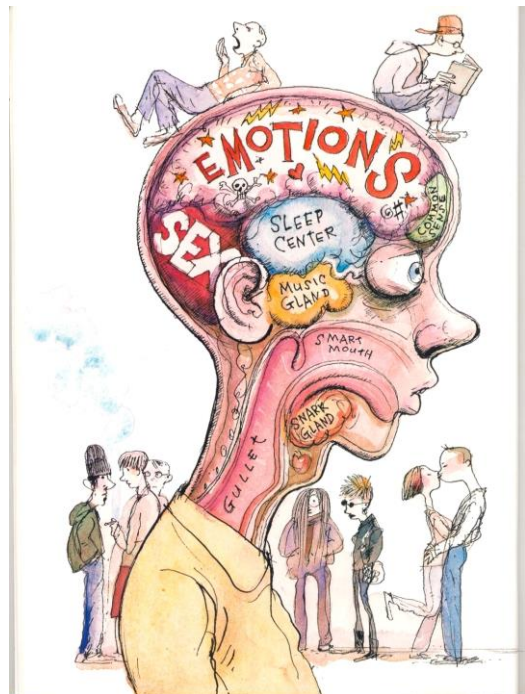
Ken Winters, Ph.D.
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October 26, 2017



Point #1: The Teen Brain Develops in Meaningful Ways

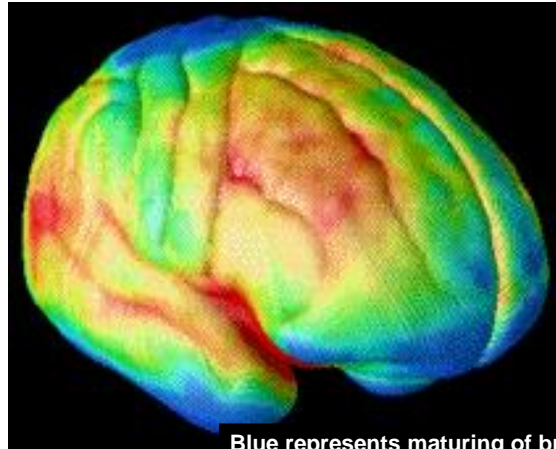


Maturation Occurs from Back to Front of the Brain and Inside to Outside

Images of Brain Development in Healthy Youth
(Ages 5 – 20)

Earlier: Limbic
Motor Coordination
Emotion
Motivation

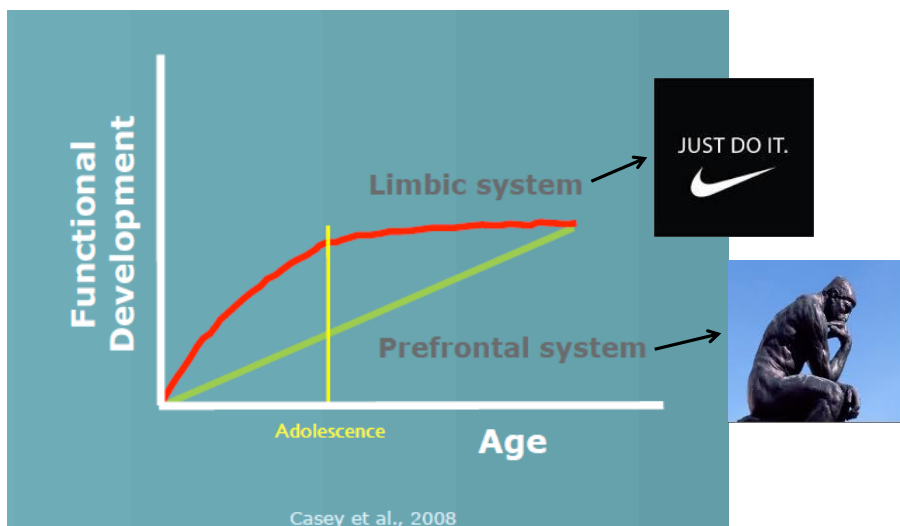
Later: Prefrontal
Judgment



Blue represents maturing of brain areas

Source: PHAS USA 2004 May 25; 101(21): 8174-8179. Epub 2004 May 17.

Recipe for Risk Taking



Recent Resource on Teen Brain Development

<http://mentor-adepis.org/brain-construction-window-developing-brain/>

The Brain Under Construction [1]: a window into the developing brain

This briefing paper is **part of a series** produced by Mentor-ADEPIS to support the delivery of effective alcohol and drug education and prevention in schools and other settings.

About Mentor

Mentor promotes best practice around building young people's resilience to prevent alcohol and drug misuse.

About ADEPIS

The Alcohol and Drug Education and Prevention Information Service (ADEPIS) is a platform for sharing information and resources aimed at schools and other professionals working in drug and alcohol prevention. In 2017, ADEPIS was recognised by UNESCO, UNODC and WHO as a prime example of best practice in alcohol and drug education.

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This briefing paper is part of a **mini-series** on 'The Brain Under Construction'. This paper looks at the structure and function of the brain and considers the uniqueness of the adolescent brain. Pictures of the brain in action show that adolescent's brains work differently from adults and scientific research is showing that the brain systems involved in decision-making, planning, social understanding and risk-taking are developing in adolescence. This research could have implications for education, rehabilitation and intervention.

This briefing paper is for:

- Teachers
- Practitioners
- Others who wish to understand more about a young person's developing brain

Point #2: Marijuana, adolescence, and driving are a bad mix



2a. Adverse Health Effects of Marijuana Use

Volkow, Baler, Compton, & Weiss, *NEJM*, 2014

Table 2. Level of Confidence in the Evidence for Adverse Effects of Marijuana on Health and Well-Being.

Effect	Overall Level of Confidence*
Addiction to marijuana and other substances	High
Abnormal brain development	Medium
Progression to use of other drugs	Medium
Schizophrenia	Medium
Depression or anxiety	Medium
Diminished lifetime achievement	High
Motor vehicle accidents	High
Symptoms of chronic bronchitis	High
Lung cancer	Low

2b. Contemporary Health Issues on Marijuana (in press).

Editors: Sabet & Winters
 Publisher: Oxford University Press

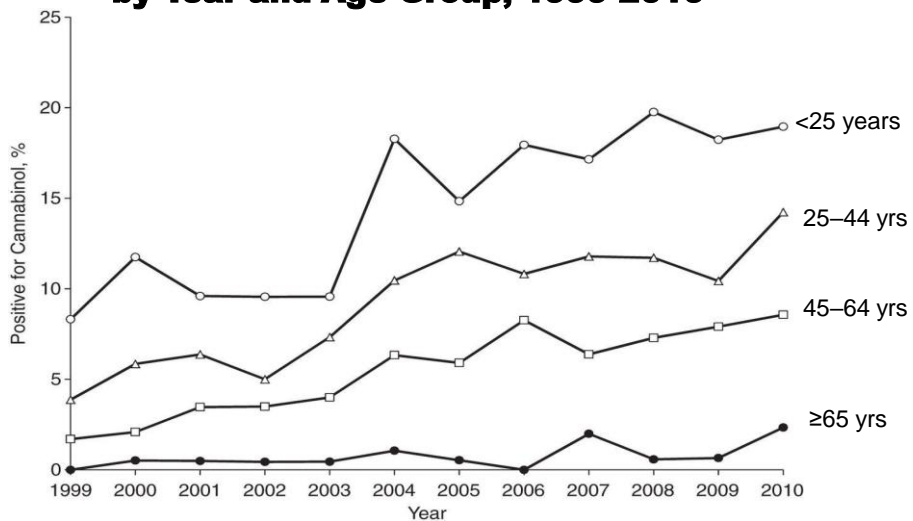
<u>Health Topic</u>	<u>Conclusion</u>
Brain structure/functioning	converging cross-sectional data suggestive that MJ affects multiple cognitive systems; longitudinal data inconclusive
Mental health	strong link for psychosis, less so for other disorders; candidate gene and early-onset use a contributor
Lung functioning	regular marijuana smoking is associated with symptoms of acute and chronic bronchitis; literature weakened by too few studies and confound of tobacco use often not controlled
Effects on driving	consistent relationship between the blood concentration of THC and driving impairment; early signs of impact on highway safety in CO and WA

2c. The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research.
National Academies of Sciences, Engineering, and Medicine, 2017

Strongest evidence that cannabis MJ is associated with...

- effectiveness for numerous medical conditions (e.g., chronic pain)
- increased risk for lung cancer
- lower birth weight of the offspring (maternal cannabis smoking)
- cognitive impairments (acute effects)
- development of schizophrenia or other psychoses; highest risk among heavy users
- development of problem cannabis use when early onset of use
- **increased risk of motor vehicle crashes**

THC Involvement in Fatally Injured Drivers by Year and Age Group, 1999-2010



Source: Brady & Li. (2014). Am. J. Epidemiology, 79, 692-699.

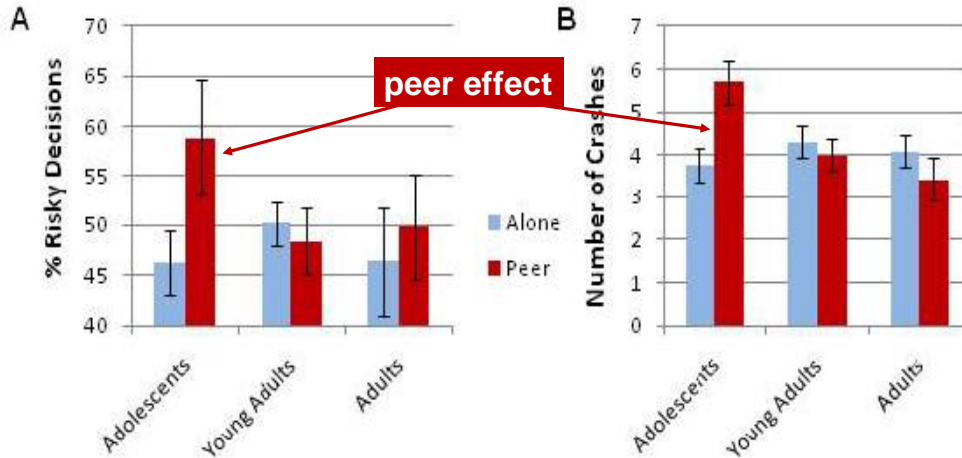
**Point #3:
Change the
Context, Change
Risk Behaviors**



Risk-Taking

- **Based on science of brain development, a modern view of risk taking in adolescence is...**
 - **evolutionarily adaptive**
 - **normative; important to development**
 - **significant individual differences**
 - **is due primarily to emotional and contextual, not cognitive, factors**

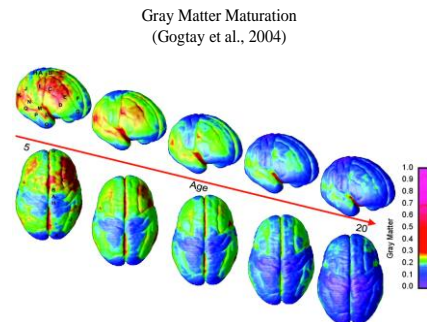
Impact of Peer Presence on Risky Driving in Simulated Context



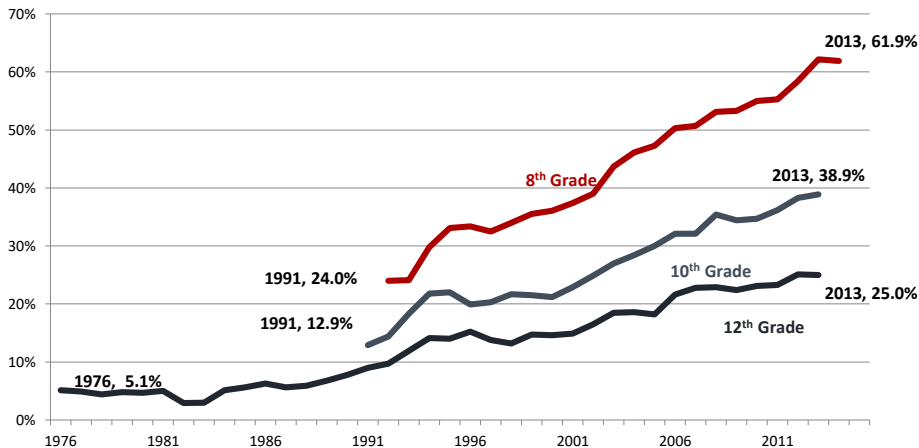
Chein et al., in press

Many Teenage Health Behaviors are Improving in Recent Years

- **Decrease in.....**
 - fatal automobile accidents
 - teen pregnancy rate
 - tobacco use
 - alcohol use
- **Increase in**
 - drug free youth



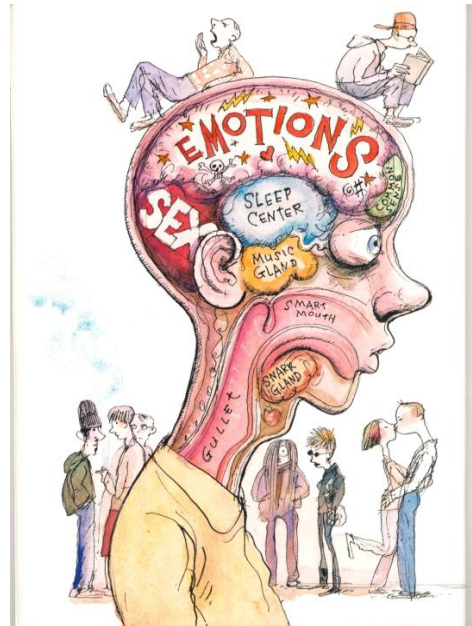
Abstaining from Illicit Drugs, Alcohol and Cigarettes - Lifetime



Robert Dupont, MD & Monitoring the Future

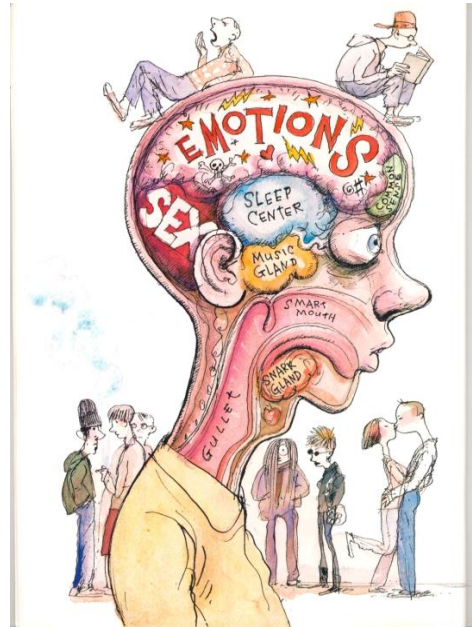
Point #4: Review

- Adolescence is an extended period of transition from reliance on adults to independence
- Normal adolescence is characterized by....
 - increase in conflicts with family members
 - desire to be with one's friends
 - resistance to messages from authority
 - emotionality
 - decision making driven more by perceived rewards rather than consequences
 - risk taking



Review

- **Rays of hope: adolescent risk taking can be mediated by context, which includes prevention efforts, public health polices, and community initiatives.**



THANK YOU!

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