

The Teen Brain

or *“What Were You Thinking?”*

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Adolescence



- Latin **Adolescere** or **“to grow up”**
- Time **between puberty** and when the person is **“legally*” an adult.**
- Not only **“chronological age”**

- To be old and wise, you have to be young and stupid first.

- Fortune Cookie



Teenagers have a bad reputation

- They're moody
- They thrive on drama
- They take risks that terrify their parents
- They are Impulsive
- They are selfish
- They seem unaware of the potential consequences of their actions
- **They are drawn to and rock 'n' roll!"**
(party!! woohoo!!!)



A simple explanation is:

- **The teen brain isn't fully cooked** — it's still in the process of rewiring and remodeling itself and maturing toward adulthood.

Quick facts about the brain

- The brain matures in a slow wave from the *rear to its front*
- From areas close to the brain stem that look after older and more basic functions, such as *vision, movement, and fundamental processing*, to the evolutionarily newer and *more complicated thinking areas up front.*



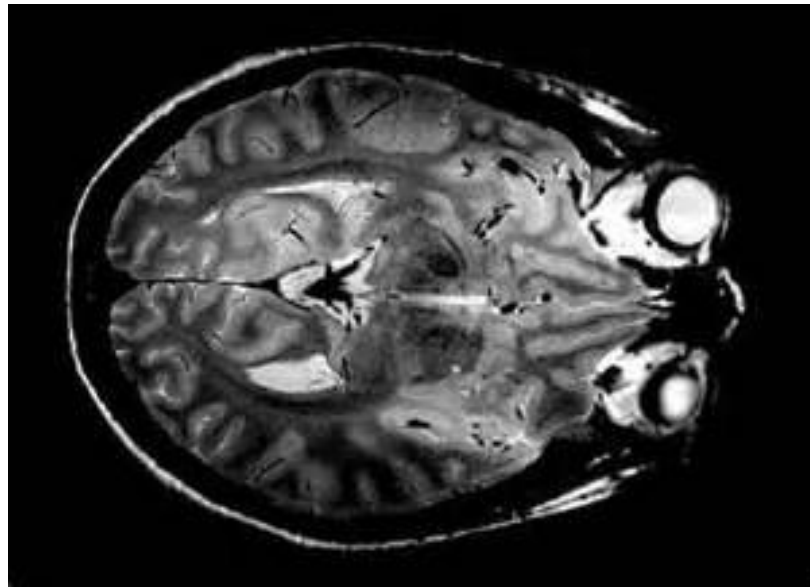
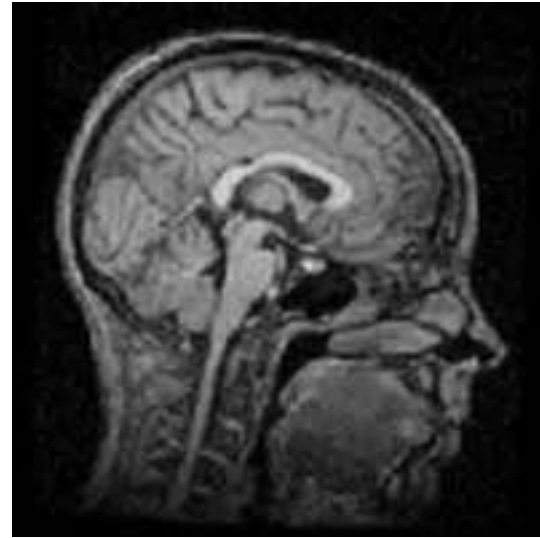
5-4 Supreme Court Abolishes Juvenile Executions

- The majority opinion cited scientific research on **a lack of maturity among adolescents** and that they are **statistically overrepresented in reckless behavior.**



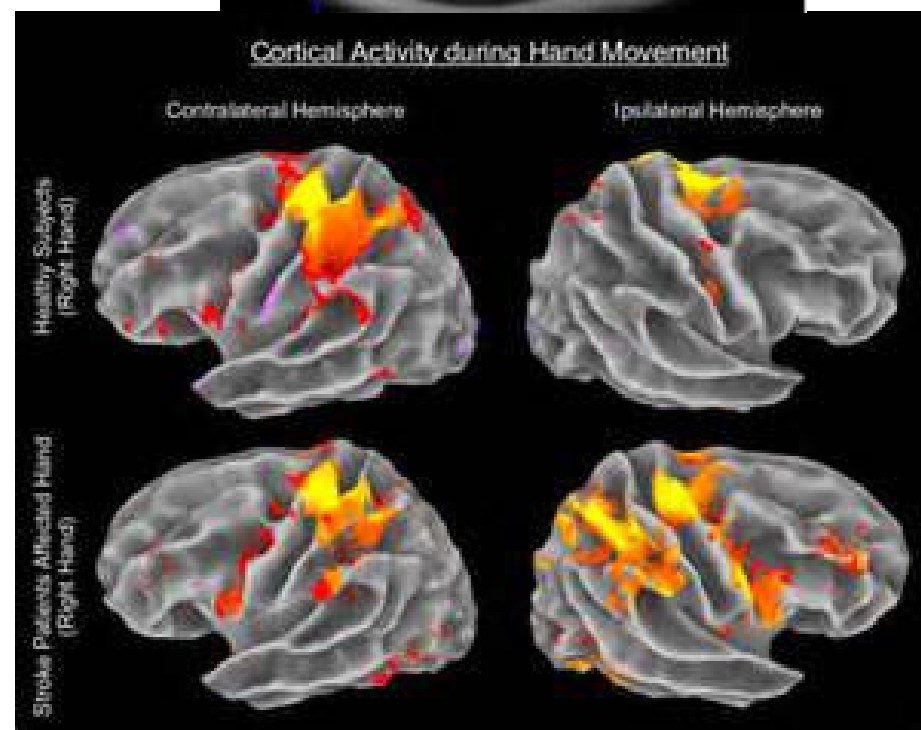
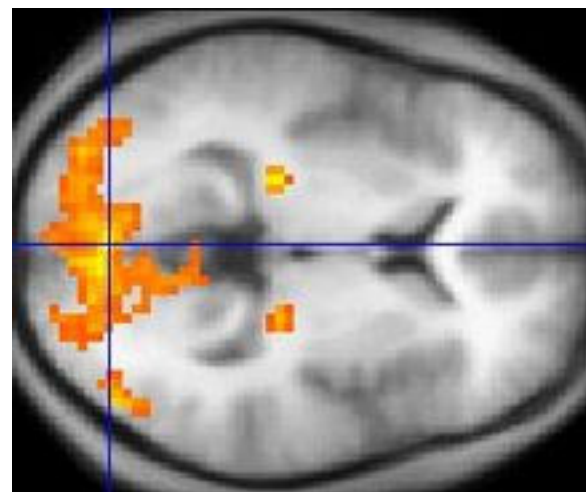
Structural MRI

- Snapshot of **grey/gray matter**
- How does it change?



Functional MRI

- Video or movie of brain activity while participants are performing a task
- Thinking, feeling or perceiving something



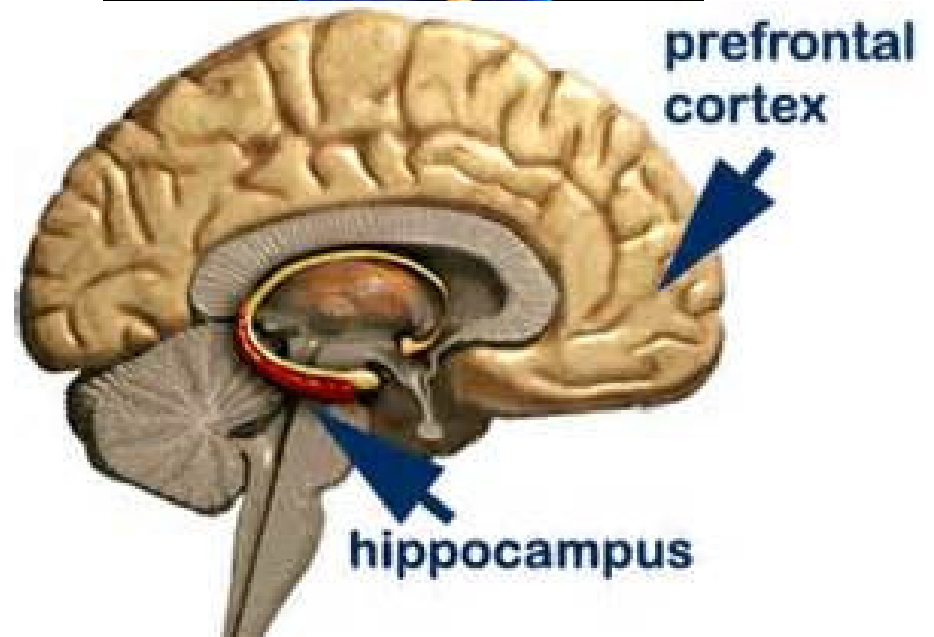
Quick facts about the brain

- The brain largely *matures by integrating* the more fundamental systems that matured earlier



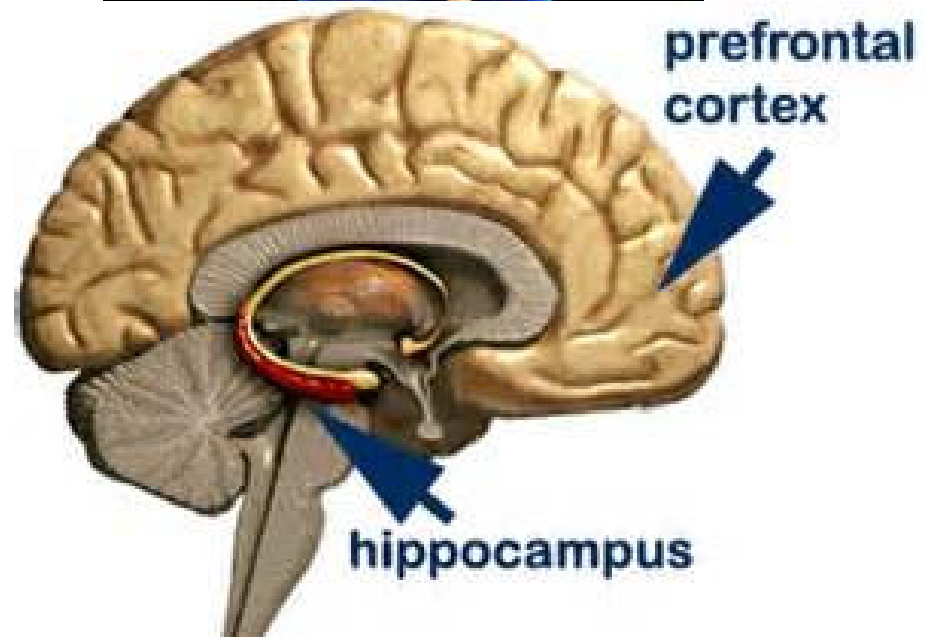
Quick facts about the brain

- **The Limbic System**
- Supports a variety of functions, including emotion, behavior, motivation, long-term memory, and smell.
- It appears to be primarily responsible for our **emotional life**, and has a great deal to do with the formation of memories.



The Limbic System

- Gives you the *rewarding feeling* after doing fun things
- Gives you the “kick” out of taking risks
- This area is **hypersensitive** in adolescents



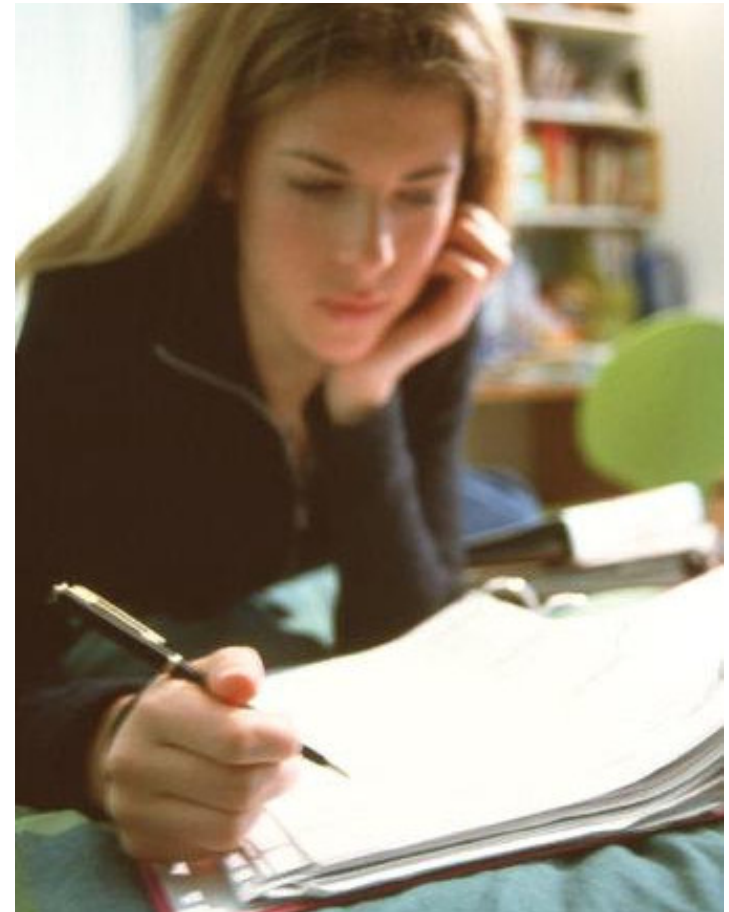
Immature Brain

- A large amount of **activity in the prefrontal cortex** of the teenage subjects
 - *Remember, they can still use their pre frontal area, it's just not "fully mature" yet*
- **Their brains were working harder to process the information.**
- Indicates **chaotic thought patterns in teens**, which generates excess work.



The brain's development proceeds in stages generally from back to front

- The *last part* of the brain to be pruned and shaped is the prefrontal cortex
- **Executive Functions**
- Planning
- Setting priorities
- Organizing thoughts
- **Suppressing impulses***
- Weighing the consequences of one's actions



Thrill

During adolescence, we hit a high in what behavioral scientists call *sensation seeking* or the hunt for the **“Neural Buzz”**.

We want the jolt of the **unusual or unexpected**.



- "If adolescents have a motivational deficit, it may mean that they are prone to engaging in behaviors that have either a **really high excitement factor or a really low effort factor, or a combination of both.**"

James Bjork

National Institute on Alcohol Abuse and Alcoholism



Teens and Risk

- “Relative to adults, adolescents engage more in **unknown risks** than they do in known risks,”
- **“Teens, it seems, love the unknown.”**
 - Dr. Agnieszka Tymula
 - New York University, *Proceedings in Teen Brains*, National Academy of Sciences.



-Dosing/Binaural Beats



Teens and Risk

- Researchers believe that adolescent risk-taking is **driven by a willingness to take risks when consequences are unknown.**
- Many experts *had* believed risk-taking was associated with teen's attraction to danger.

• **THEY ARE DRAWN TO SOMETHING
(EXPERIMENTATION)
BECAUSE THEY
DON'T KNOW WHAT
IS GOING TO
HAPPEN.**

Teen Angst? Raging Hormones? Emotions?

- Biochemical changes are linked to many of the intense, combustible emotions and unpredictable behavior of teens



Teen Angst? Raging Hormones? Emotions?

- Mental illnesses such as schizophrenia and bipolar disorder.
- **Typically begin in adolescence** and contribute to the high rate of teen suicide.
- By-product of two factors:
 - **an excessive amount of hormones**
 - **a scarcity of the cognitive controls needed for mature behavior.**
 - Remember poor impulse control?



THE “Pack” Mentality

- Temple University risk assessment study
- “*Get there quickly*”
- Teens and adults studied



Peer Pressure

- “Double Dog Dare you...”
- “All the cool kids are doing it...”
- “No guts, no Glory...”



Peer Pressure

- Being **accepted** by their peer group is **EXTREMELY** important for their development.



The “Pack” Mentality

- Teens are looking for activities that are *emotionally arousing* or have high social impact* (remember this?)
 - *Woohoo! Party!*



Dopamine/Risk and Drugs, Alcohol and Addiction

• Risk taking also leads teens to experiment with drugs and alcohol.



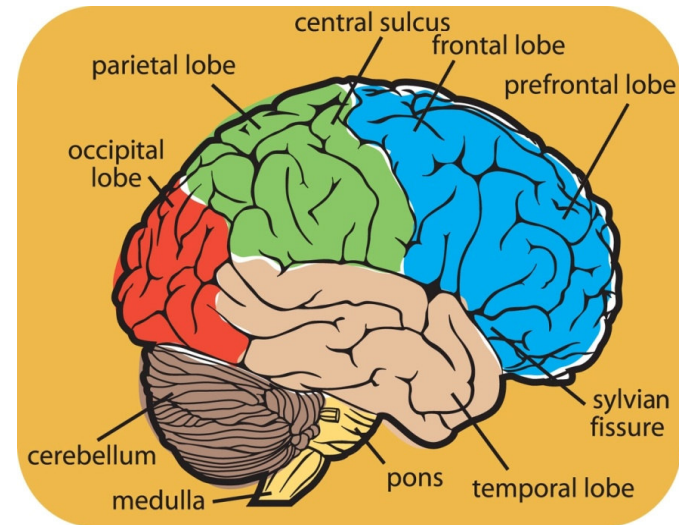
Dopamine/Risk and Drugs, Alcohol and Addiction

- Teens are more susceptible than adults to alcohol-induced toxicity
- Stays in their system longer than adults



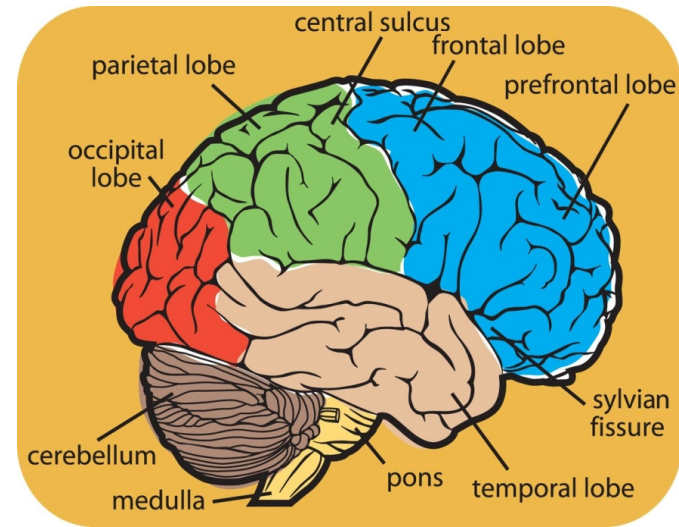
Go to Sleep!

- The pineal gland produces **melatonin**, which influences both **sleep-wake cycles** *and* sexual development



Go to Sleep!

- It takes longer for melatonin levels to rise in teenagers than in younger kids or in adults, **regardless of exposure to light or stimulating activities.**
- "The brain's program for starting nighttime is later
 - Mary Carskadon
Brown University



- Children and adults were asked to identify the emotions displayed in photographs of faces

- *under fMRI.*

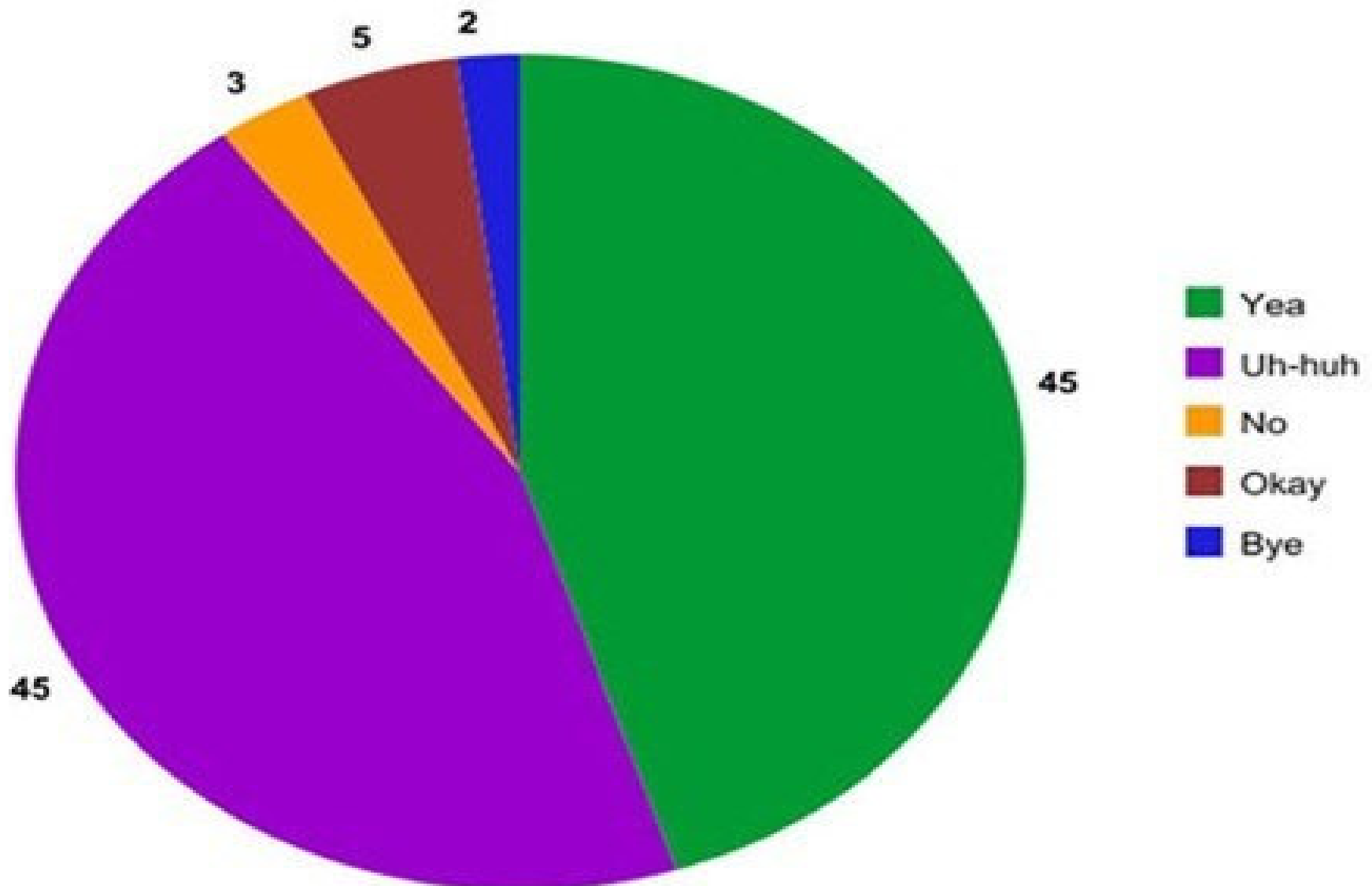
- Harvard neuropsychologist Deborah Yurgelun-Todd

McLean Hospital, Belmont, Mass.,

- Children and young adolescents rely heavily on the amygdala which is associated with **emotional and gut reactions.**
- Adults rely less on the amygdala and more on the frontal lobe, ***a region associated with planning and judgment.***
- Adults make few mistakes in assessing photos

Talking with teenagers

Things I say when I'm talking to my mom



Talking with teenagers

- **Body Language**

Eighty percent of communication is nonverbal.



Talking with teenagers

- Don't let the kid think that the conversation is going to go on indefinitely.
- Driving them to somewhere where they know **they only have to talk to you for “a little while”** and there is *light at the end of the tunnel*.

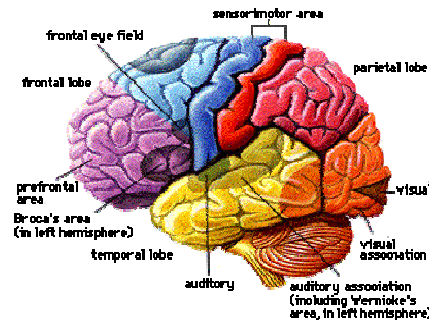


Talking with teenagers

- You are not “cool” in their eyes.
- You will never be “cool” in their eyes.
- **DON'T TRY TO BE COOL, JUST BE AN ADULT TALKING TO A KID.**



What is the “gist” of this presentation?



The Teen Brain or “*What were you Thinking?*”

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- Teen Brains still developing until 25
- Pack mentality
- They are prone to take risks
- They don't think of consequences
- Don't try to be cool when talking to a teen
- Don't beat the topic to death

Summary

- The main difference between teenagers and others is that **they value the rewards** (gained from taking the risks) **much more than adults.**



- “It's the task of the teenager **to fire their parents** and then re-hire them years later, but as ***consultants*** rather than ***managers.***”



THE END

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