

Incorporating Adolescent Brain Development Research



Into Youth Programming

Adolescence

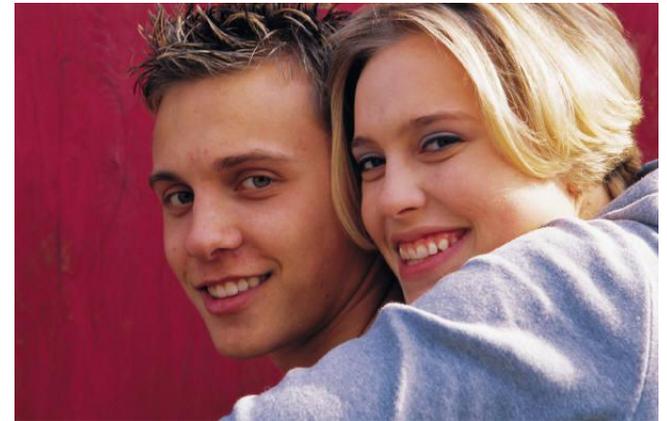


Adolescence is defined as the transition from childhood to adulthood or the psychological, social and emotional changes that accompany puberty

Erikson's Psychosocial Theory of Development Adolescence: Ages 12-18 (or 24)

Identity versus role confusion

A time for testing limits, for breaking dependent ties, and for establishing a new identity. Major conflicts center on clarification of self-identity, life goals, and life's meaning. Failure to achieve a sense of identity results in role confusion.



Practical Implications: Establishing Identity



- Understanding

- Provide Opportunities



Practical Implications: Supporting Autonomy and Independence

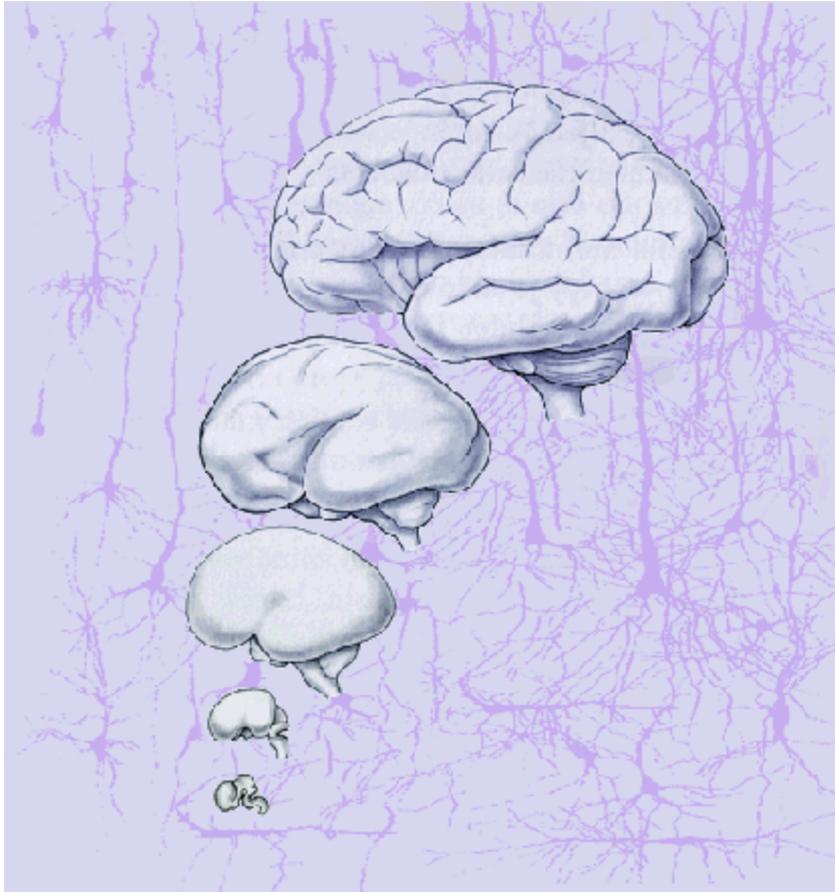


- Space/Mobility

- Personal Expression

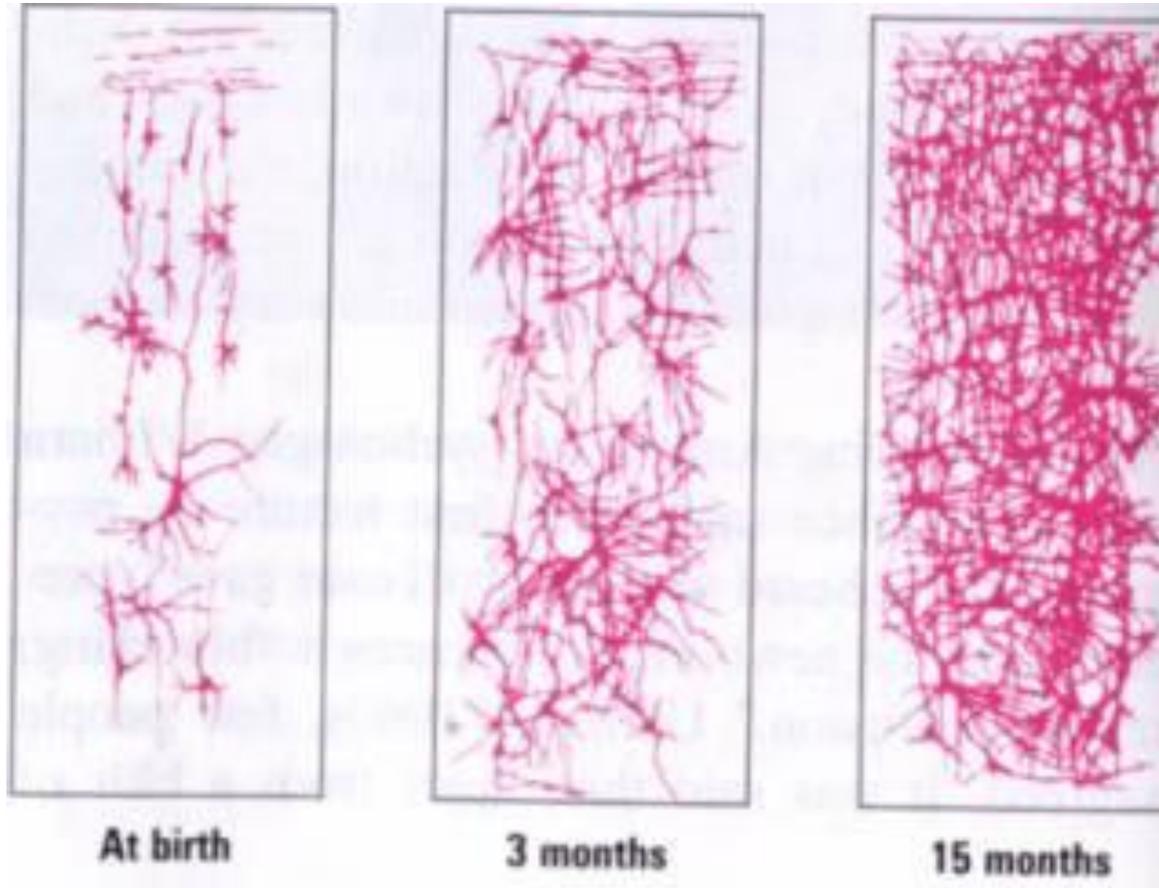
- Job/Fiscal Responsibility

Brain Development Overview



It now appears the brain continues to change into the early 20's with the frontal lobes, responsible for reasoning and problem solving, developing last.

Neural Growth



Temporal Lobes

TEMPORAL LOBE



The temporal lobes handle auditory information. But deep down within the temporal lobes is a structure called the hippocampus, and it is responsible for memory.

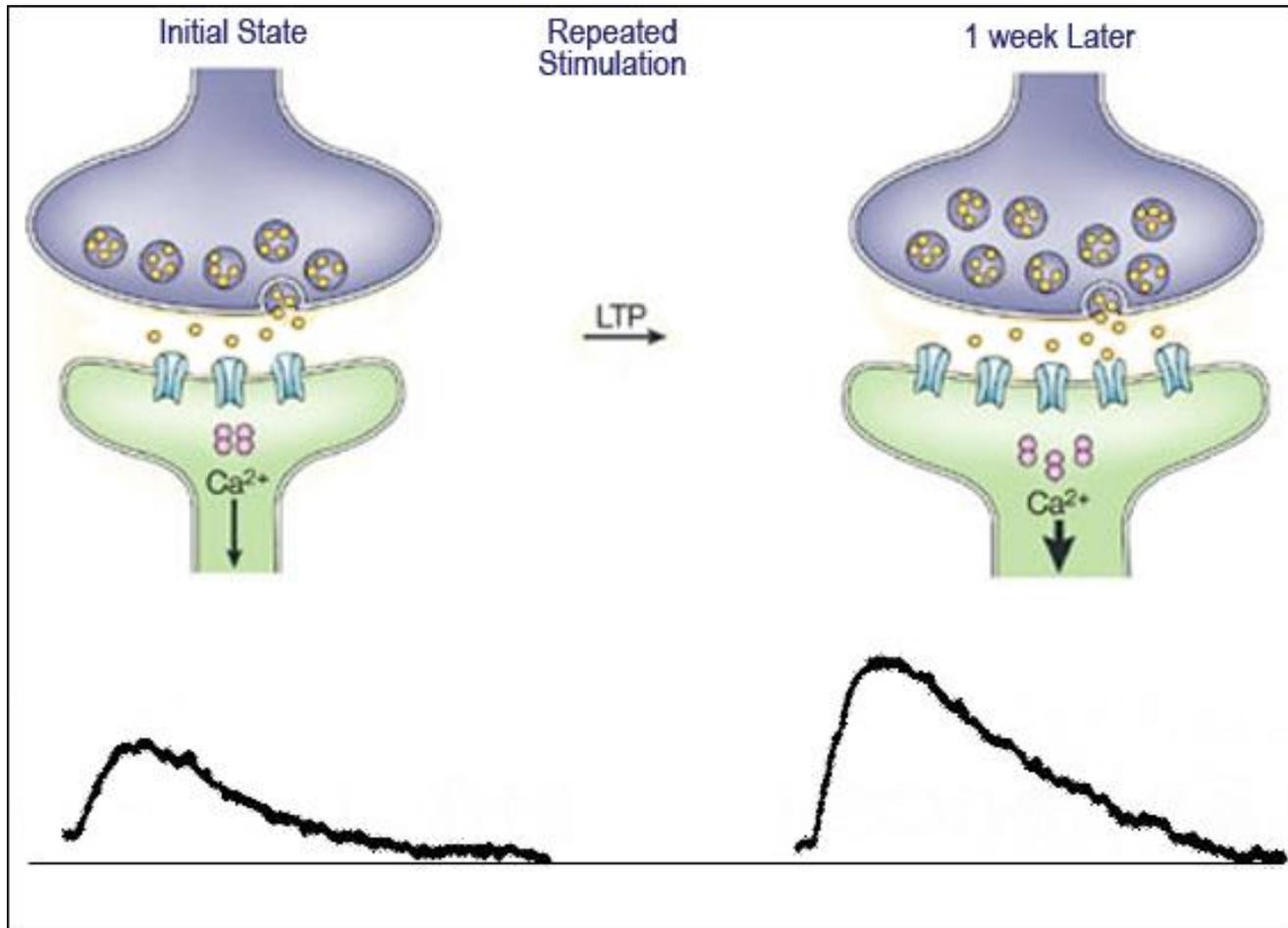
Between seven and eleven, this area is working very efficiently and shows tremendous growth and development.

Practical Implications: Capitalize on Building Skills



- Increase exposure to a variety of different activities and experiences to capitalize on the plasticity of the brain during this stage of development.

Long Term Potentiation



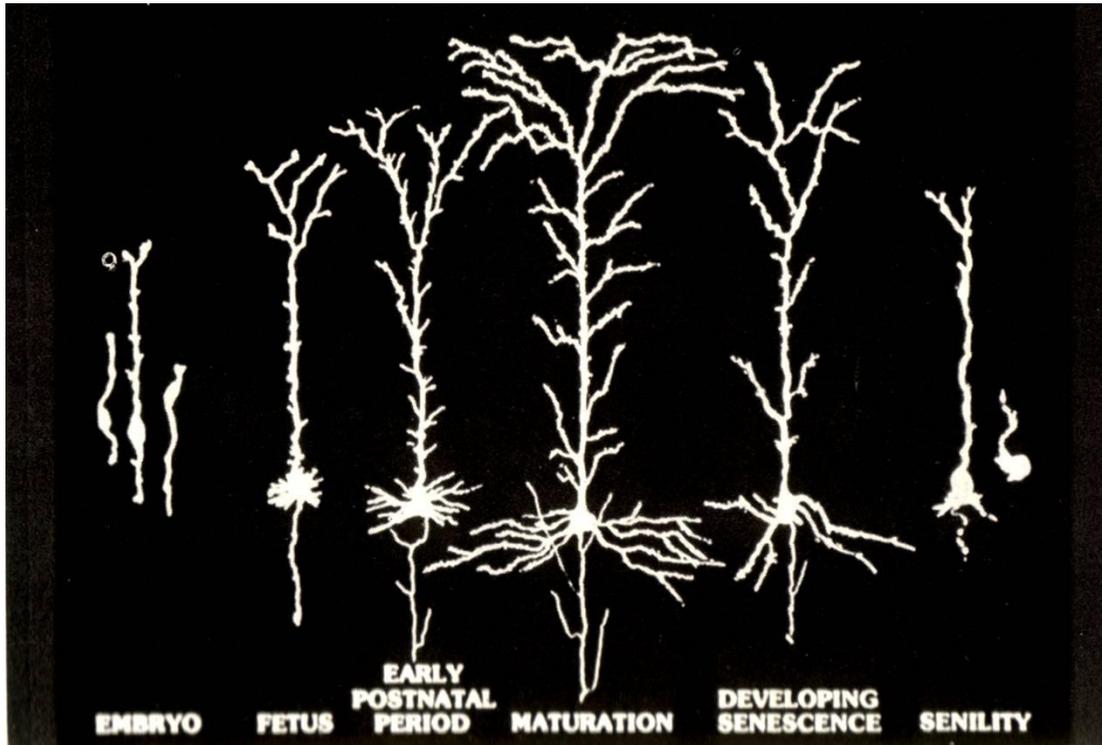
Practical Implications: Capitalizing by Reducing Risks

Inhibitors of Long-Term Potentiation:

- Alcohol
- Marijuana
- Stimulants and ADD
- Stress
- Sleep Deprivation
- Multitasking
- Nicotine

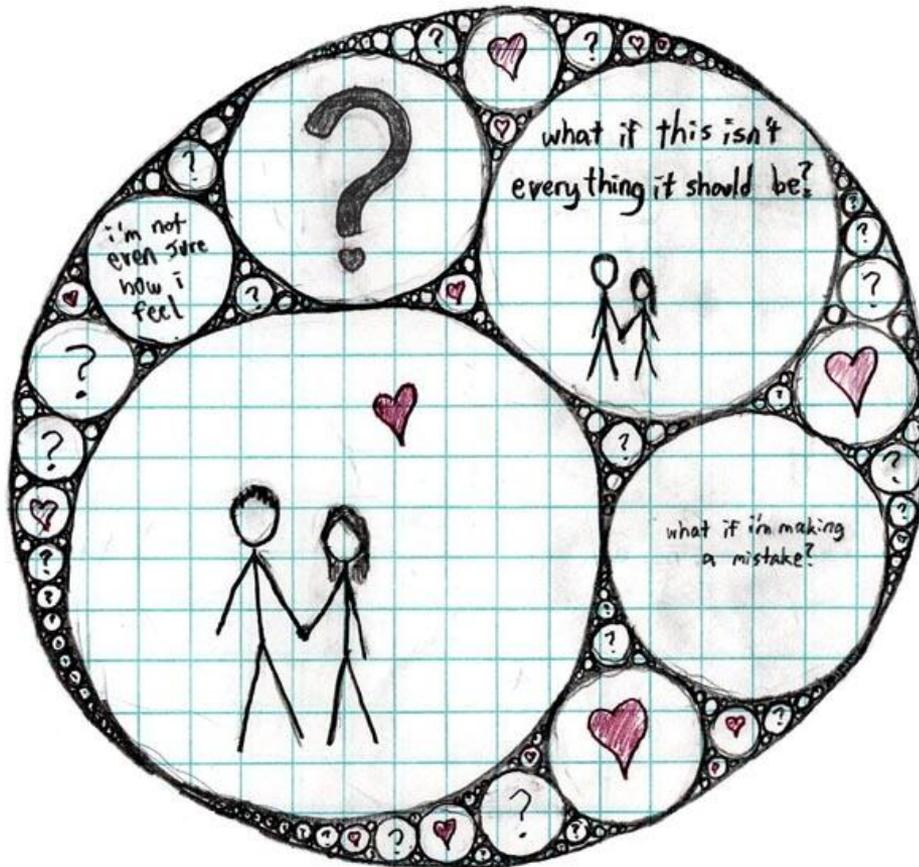


Synaptic Growth Spurt



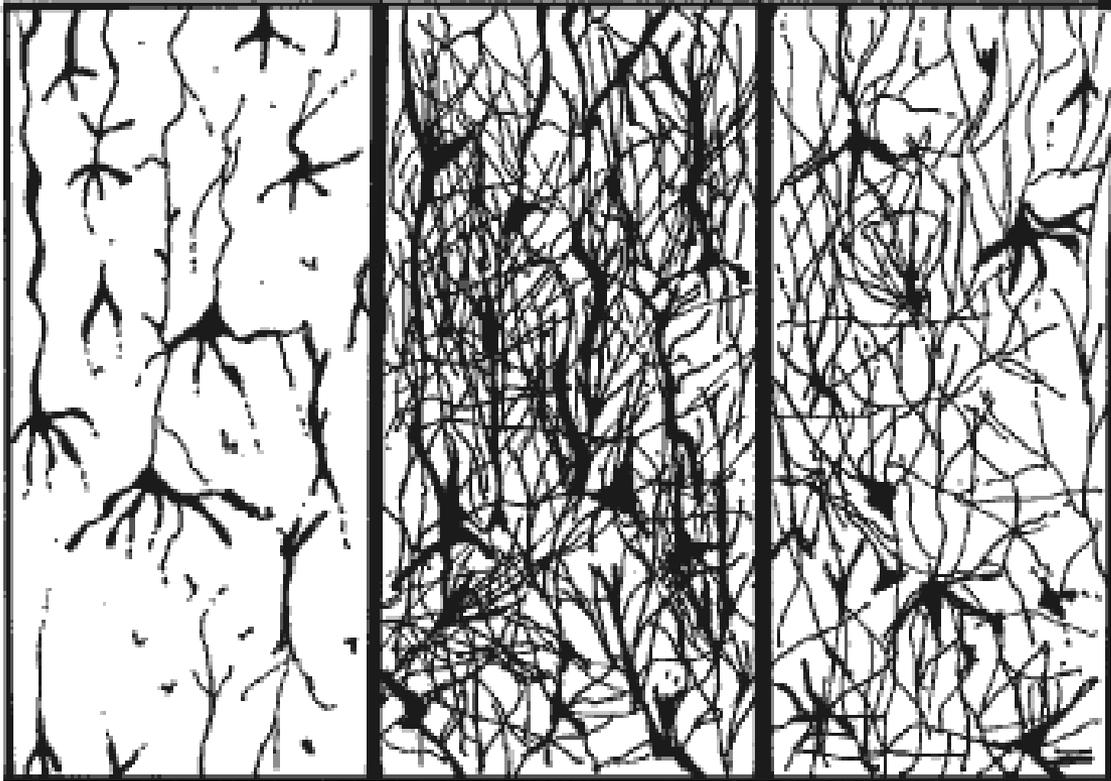
- Excitatory vs. Inhibitory

Practical Implications: Practicing Thoughtful Processing



- Leading Questions
- What if....
- Possible Consequences
- Logistical Considerations

Synaptic Pruning



at a child's birth

at 7 years of age

at 15 years of age

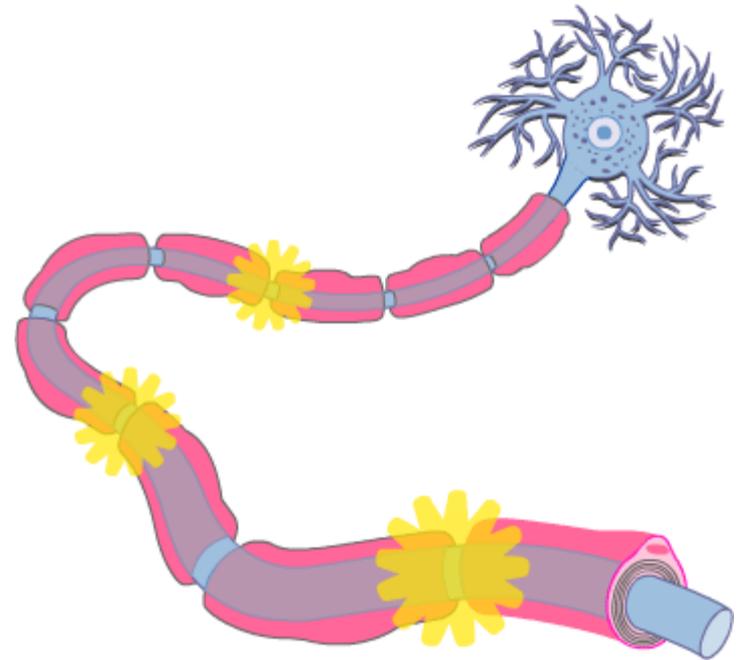
The next change after this synaptic growth spurt is a selective pruning which takes place.

In adolescence, most of this pruning is taking place in the frontal lobes.

The adolescent loses approximately 3 percent of the gray matter in the frontal lobes.

Adolescent Brain Development: Myelination

- The second change is in myelination; in adolescence, it is not finished. The last part of the brain to myelinate is the frontal lobes. And myelination is not complete in the frontal lobes of the brain until around 18 to 20 or later.
- Myelination on a neuron allows it to operate more efficiently.



Resulting Behavioral Changes, Appropriate Responses

Early Adolescence (ages 11-14)	Adult Responses
<ul style="list-style-type: none"> • Variation btwn those still focused on logic & those able to combine logical & abstract thinking. • Some can't think ahead to consequences of their actions. • Dvlp new thinking skills: possibilities, thinking abstractly, thinking about the process of thinking & in multiple dimensions which leads to questioning • Practicing new thinking skills through humor & by arguing with parents and others. Humor focused on satire, sarcasm, and sex 	<ul style="list-style-type: none"> • Introduce and discuss abstract concepts and encourage abstract thinking • Help them follow through with natural and possible consequences • Encourage metacognition, exploration of all possible outcomes, explain reasons for rules and your own way of thinking • Provide “safe” moments to debate; use humor to teach

Practical Implications: Meet them at their developmental level



- Despite their newly formed abstract thinking skills, young teens are still very concrete.
- Provide hands-on experiences.
- Let them use emotion to enhance learning.

Resulting Behavioral Changes

Middle Adolescence (ages 15-18)	Adult Responses
<ul style="list-style-type: none">•Major broadening of thinking abilities: can think abstractly and hypothetically;•Discern underlying principles of various phenomena & apply them to new situations;•Can think about the future, considering many possibilities & logical outcomes.•Greater perspective-taking = more empathy & concern of others & new interest in societal issues.•See things as relative not absolute	<ul style="list-style-type: none">•Ask what if... questions•Help them find explanations to behavior/situations; similarities of cultures, religions, etc.•Explore logistical and practical realities of situations•Provide role play situations to help them “walk in someone else’s shoes”; engage them in service projects of their choice• Explore the nuances of the “gray areas”

Resulting Behavioral Changes



- Teens tend to exhibit a "justice" orientation and a strong belief in individual rights.
- They are quick to point out inconsistencies between adults' words and their actions.
- They begin to question rules and adult decisions
- They have difficulty seeing shades of gray. They see little room for error.

Practical Implications: Encourage the Social Activist

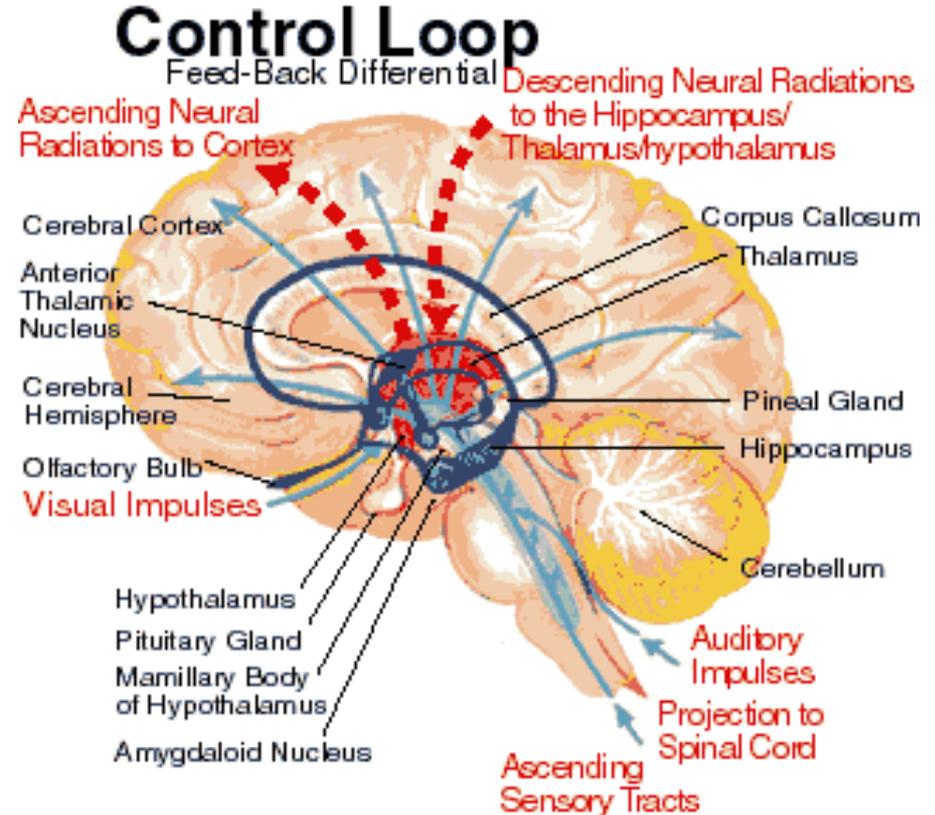


- Engage new social awareness
- Idealism vs. realism
- Empathy building
- Infinite possibilities

The Prefrontal Lobes

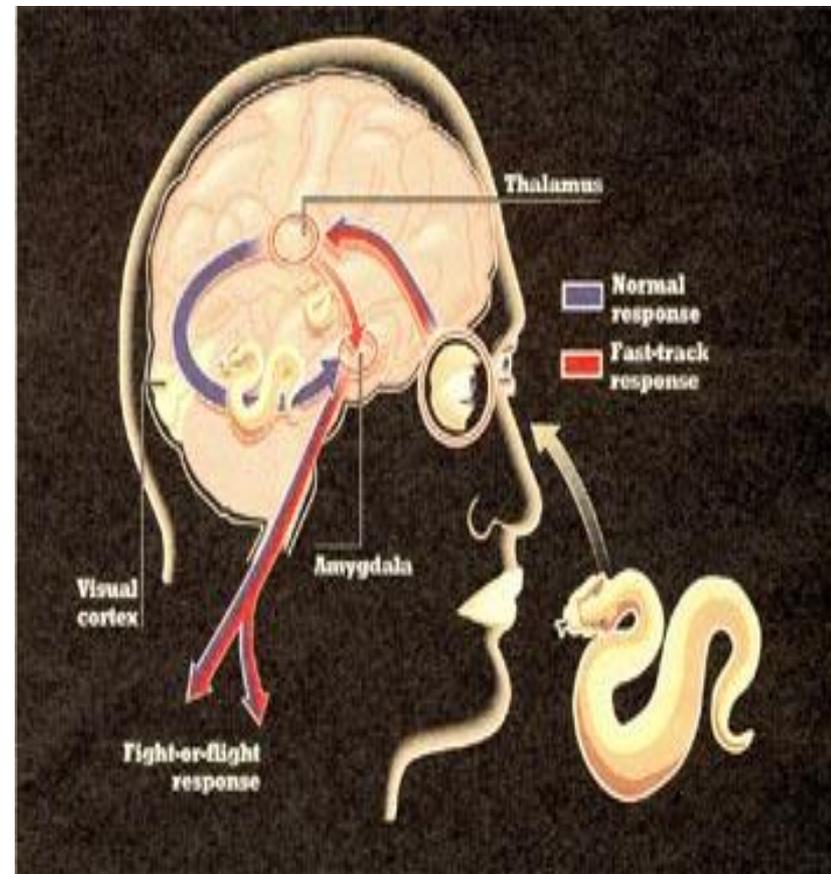
The prefrontal lobes are responsible for:

- Emotional control, the third change in the adolescent brain.



Emotional Control

- The amygdala is responsible for processing incoming sensory information
- The role of the amygdala is to hold emotional memory.
- It is the amygdala that is going to start off the fight or flight response if that sense that is coming in is dangerous. That is its main role.
- Key: the amygdala develops before the frontal lobes develop.

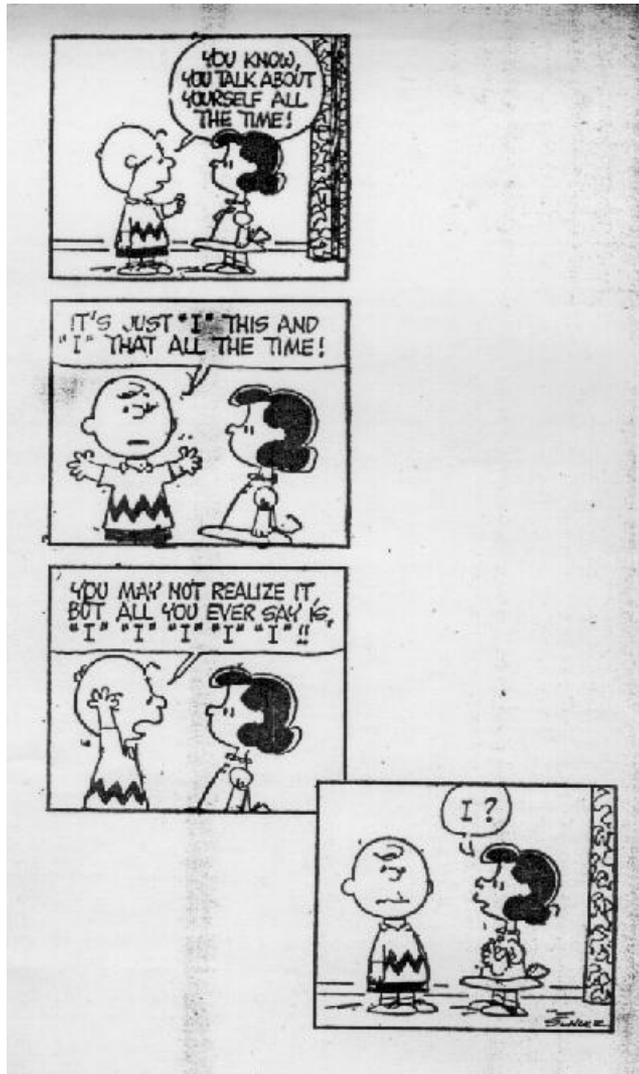


Resulting Behavioral Changes



- They may become overly dramatic in describing things that are upsetting to them.
- Teens' emotional experiences are more intense

Resulting Behavioral Changes



- Teens become more egocentric
- Teens tend to believe in the “personal fable,” that no one else has ever experienced similar feelings and emotions.

Practical Implications: Active Listening and Modeling

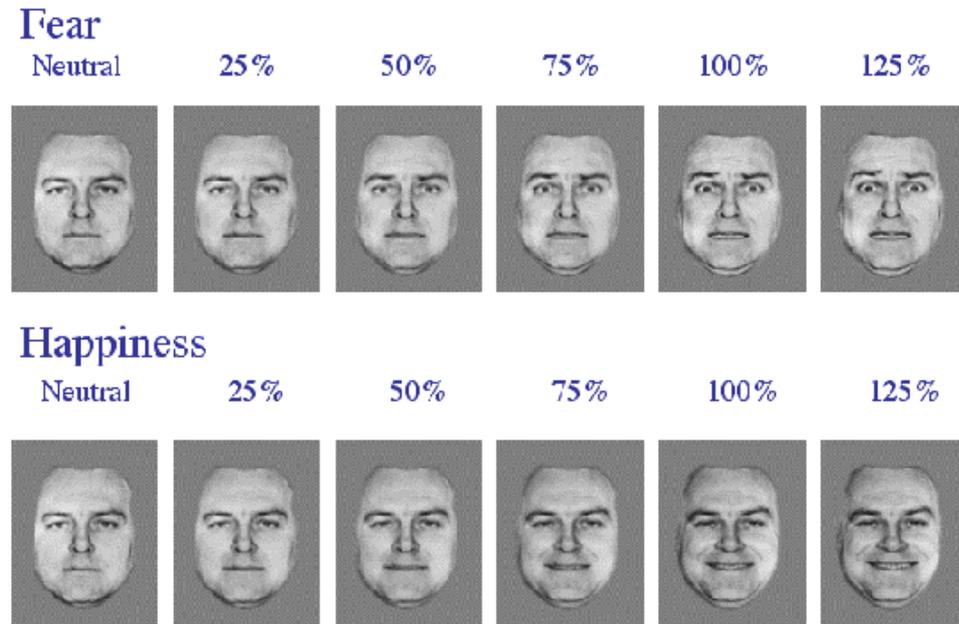
- L** = Look interested - get interested
- I** = Involve yourself by responding
- S** = Stay on target
- T** = Test your understanding
- E** = Evaluate the message
- N** = Neutralise your feelings



Synchronicity

Resulting Behavioral Change

- Adolescents are not good at reading emotions.
- Adolescents tend to label neutral or ambiguous facial expressions and tones as negative.



Practical Implications: Facilitate Emotional Intelligence

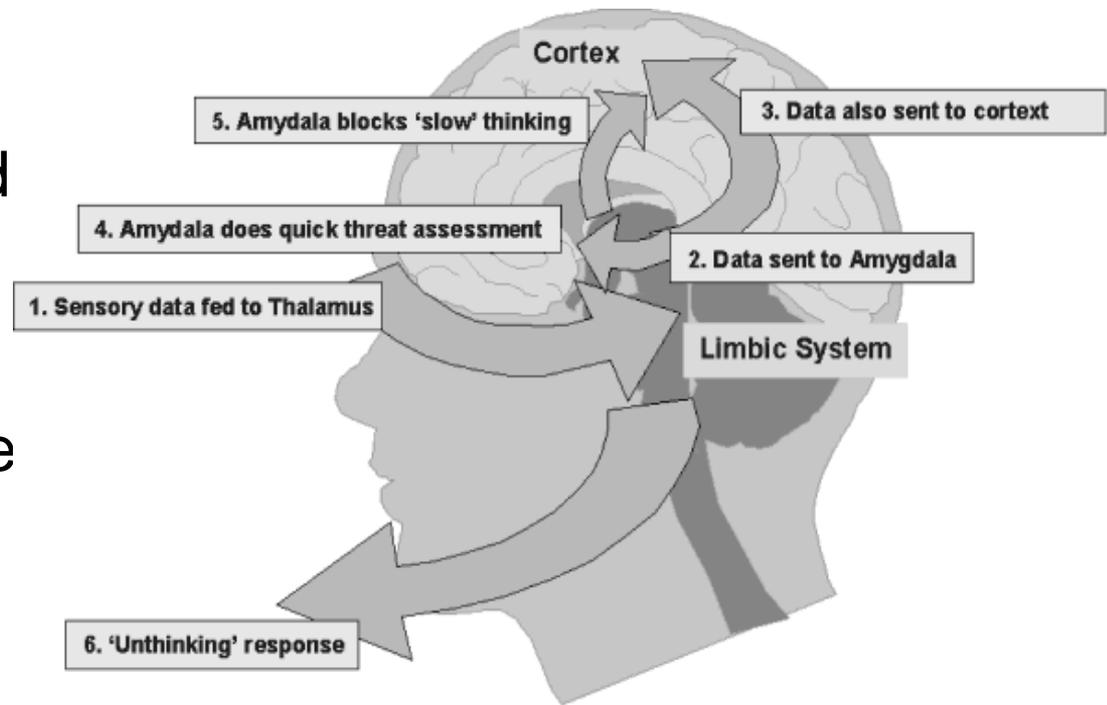
- Reading emotion – verbalize feelings
- Expressing emotion
- Practice, practice, practice

eMotions

						
aggressive	alienated	angry	annoyed	anxious	apathetic	bashful
						
bored	cautious	confident	confused	curious	depressed	determined
						
disappointed	discouraged	disgusted	embarrassed	enthusiastic	envious	ecstatic
						
excited	exhausted	fearful	frightened	frustrated	guilty	happy
						
helpless	hopeful	hostile	humiliated	hurt	hysterical	innocent
						
interested	jealous	lonely	loved	lovestruck	mischievous	miserable
						
negative	optimistic	pained	paranoid	peaceful	proud	puzzled
						
regretful	relieved	sad	satisfied	shocked	shy	sorry
						
stubborn	sure	surprised	suspicious	thoughtful	undecided	withdrawn

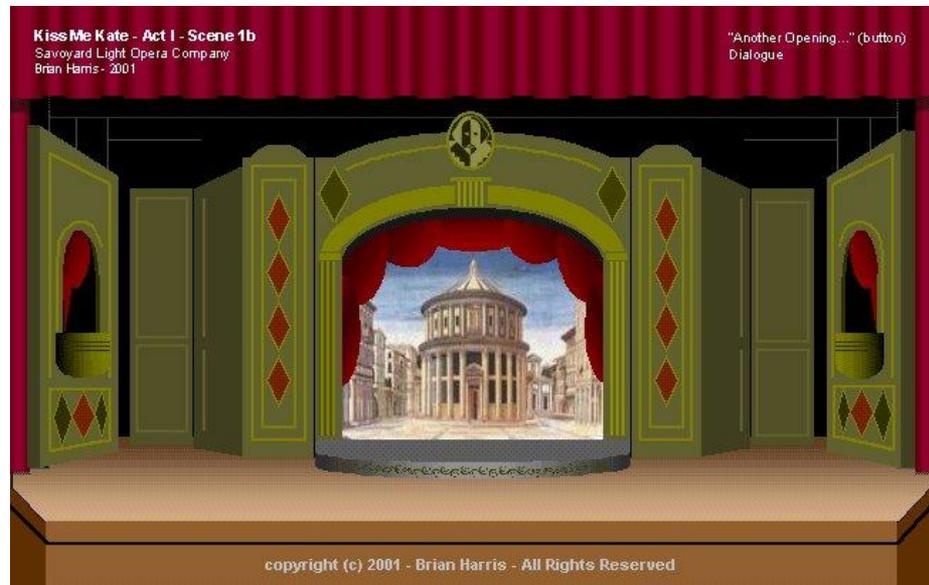
Emotional Control

- There are real differences in an adolescent brain and an adult brain when they are in an emotional situation.
- What adults have the ability to do is to reflect
- This does not happen in the adolescent brain.



Resulting Behavioral Changes

- Teens demonstrate a heightened level of self-consciousness.
- Teens tend to believe that everyone is as concerned with their thoughts and behaviors as they are. This leads teens to believe that they have an "imaginary audience" of people who are always watching them.



Practical Implications:

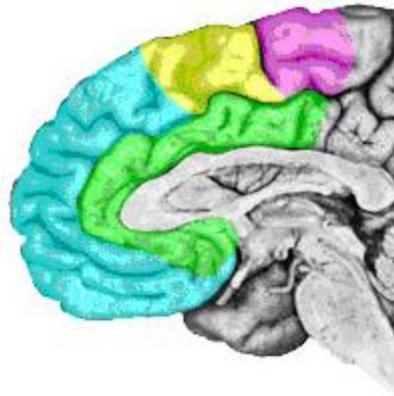
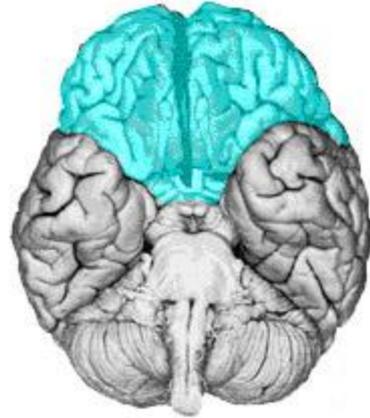
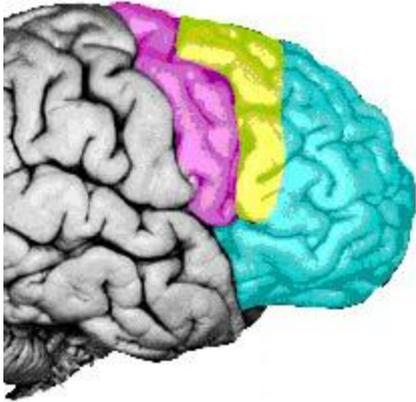
Strengthen Frontal Lobe-Limbic Connection

- Create Downtime
- Experience-Dependent
- Help Them Find Disconfirming Evidence



Prefrontal Lobes

The Late Bloomer

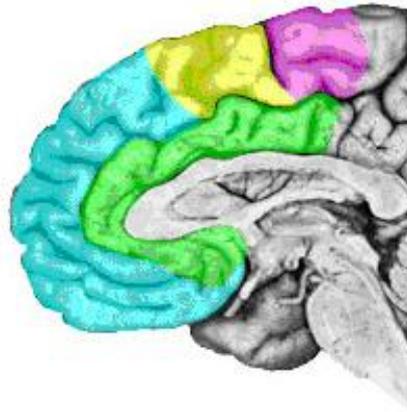
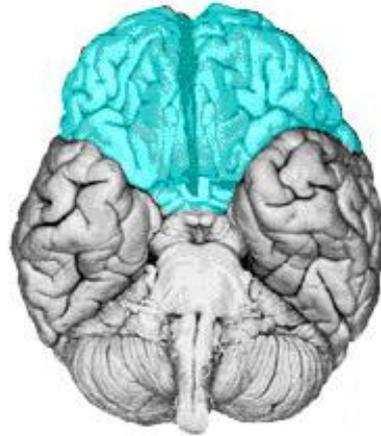
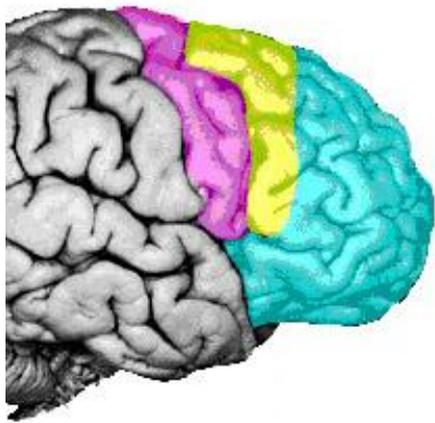


- Motor
- Premotor
- Prefrontal
- Limbic

- The prefrontal lobes are responsible for:
- Reasoning ability.
- Adults can provide “learning moments” to strengthen this skill in adolescence
- Remember, it is a ***learned*** skill

Prefrontal Lobes

The Late Bloomer



Motor
Premotor
Prefrontal
Limbic

The prefrontal lobes are responsible for:

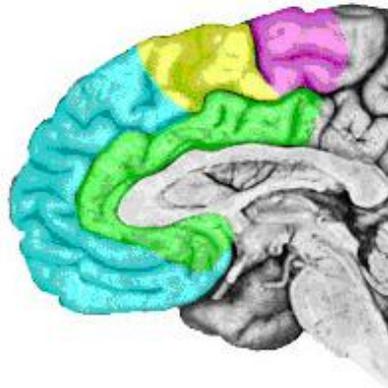
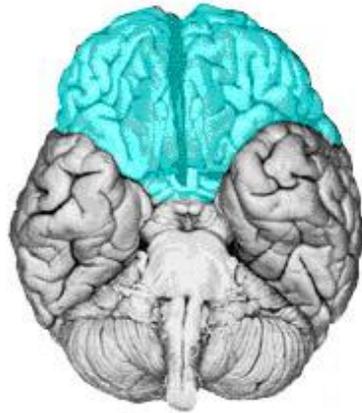
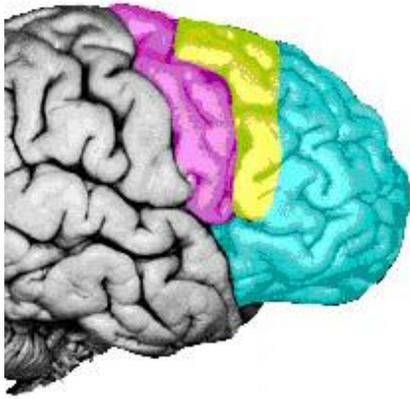
Goal and priority setting.

Adolescents have a great deal of difficulty prioritizing.

Adults can help them find personal importance and set small achievable goals

Prefrontal Lobes

The Late Bloomer



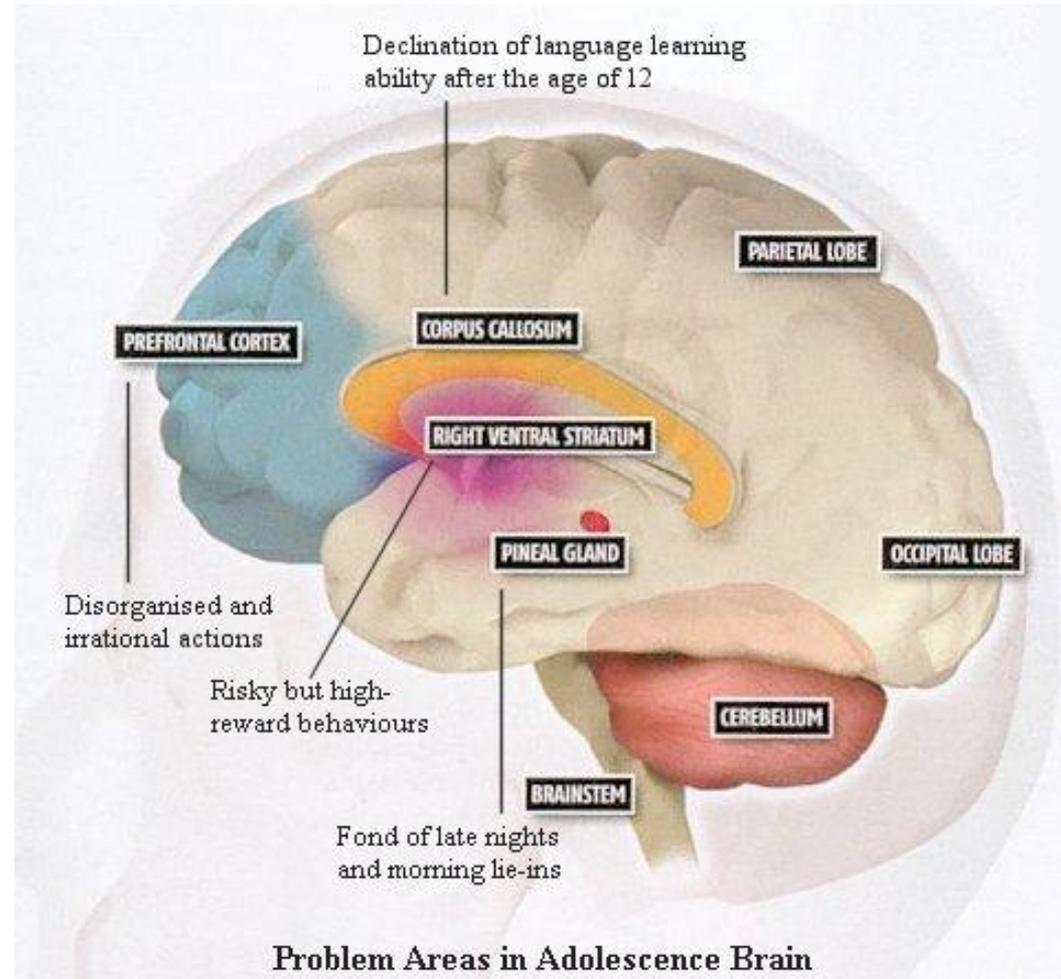
Motor
Premotor
Prefrontal
Limbic

- The prefrontal lobes are responsible for:
- Planning and organization of multiple tasks.
- Adolescents are terrible at multitasking.
- Adults can simplify tasks; model single-focused attention

Prefrontal Lobes

The prefrontal lobes are responsible for:

- Impulse inhibition.



Resulting Behavioral Change



Teens experience a greater desire & need for thrill-seeking than any other age group.

Teens tend to exhibit the "it can't happen to me" syndrome also known as the "invincible fable."

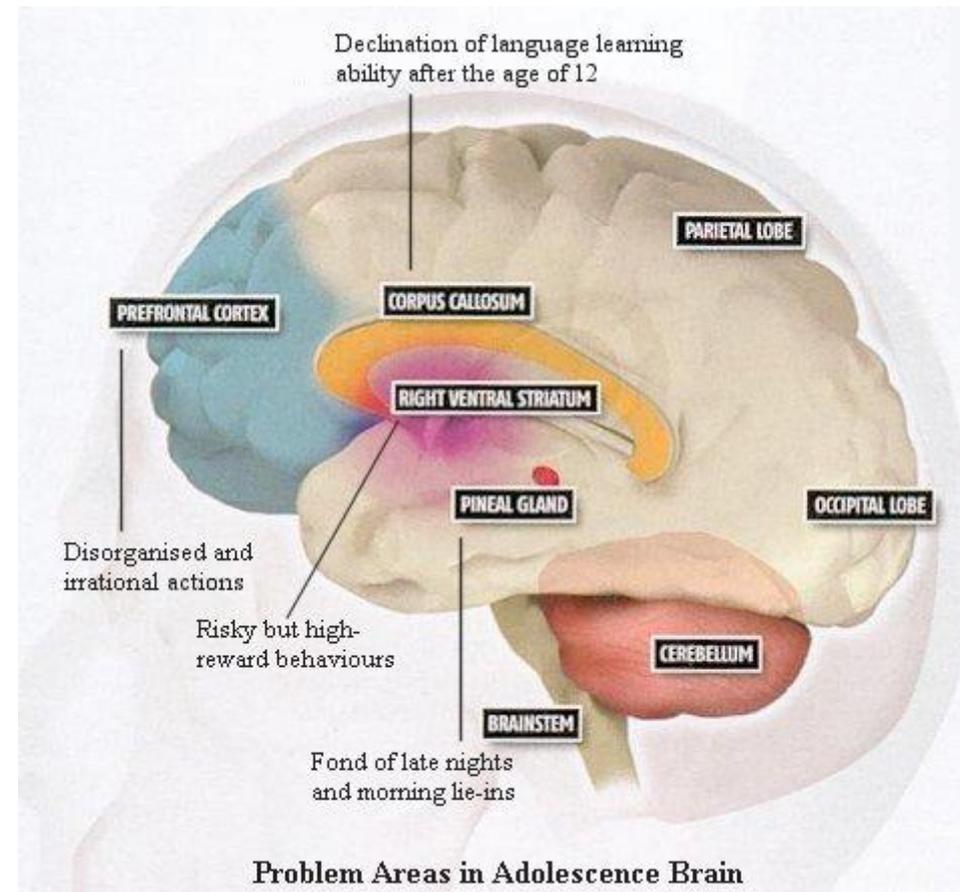
Practical Implications: Create “Safe” Thrills



- Recreation
- Novel events
- Beyond the Comfort Zone

Prefrontal Lobes

- Determining cause and effect relationships.
- Determining right from wrong.
- Making sound judgments



Resulting Behavioral Changes

- Poor decision-making

http://www.youtube.com/watch?feature=player_detailpage&v=xbD4B3fk3_8

- Inconsistent behavior



Practical Implications: Provide Learning Moments

- Natural Consequences
- Targeted Scenarios
- Role Plays



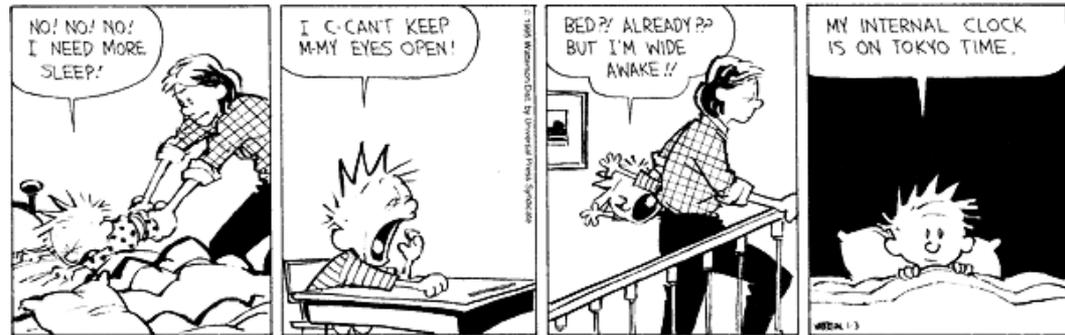
The Importance of Sleep

- Studies of sleep patterns in adolescents reveal two important findings:
- Number one, adolescents need much more sleep than we thought they did.
- Findings now indicate through sleep lab experiments, by letting adolescents sleep an optimal time and just finding out when they wake up, it is about nine and a half hours.



The Importance of Sleep

- Finding number two:
- In the adolescent brain circadian rhythms are set much later; the sleep-wake cycle does not begin until 11:00pm or 12:00 midnight.



Practical Implications: The Importance of Sleep

- Sleep is one of the best things you can do for your brain.

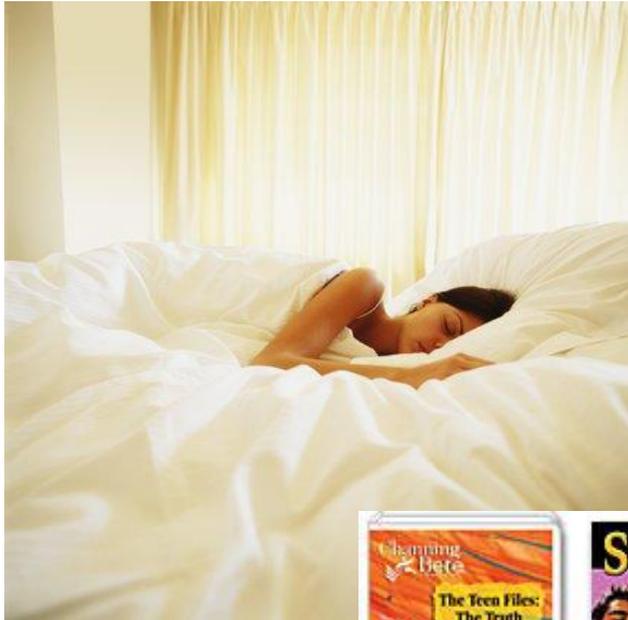


General Implications: Build Brain Capacity



- Involve adolescents in physical activities that facilitate the development of the cerebellum which coordinates physical, mental and social activities.
- Physical exercise increase learning capacity

General Implications: Minimize Risks



- Encourage them to sleep well
- Help them avoid the risks of substances during this critical period.
- Help them reduce stress by increasing coping skills and support

Resources

- R.A. Ozretich, S.R. Bowman
- **Pat Wolfe**, Mind Matters, Inc., Napa, CA: **The Adolescent Brain: A Work in Progress**
- **Adolescent Growth and Development**
Author: Angela Huebner, Assistant Professor and Extension Specialist, Family and Child Development, Virginia Tech
- **Sam Goldstein**, Hardwired to Learn, Learning and the Brain Conference, 2008

Q & A



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