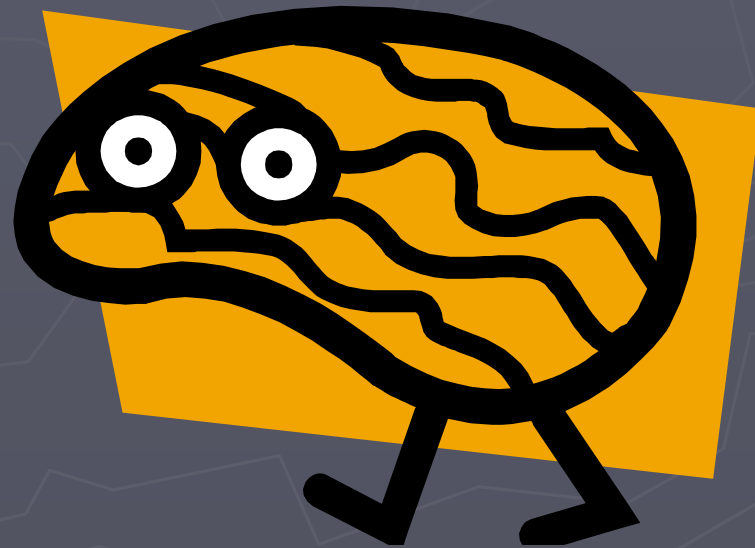


The Apprentice Brain

Science that Educators, Parents &
Professionals Crave!



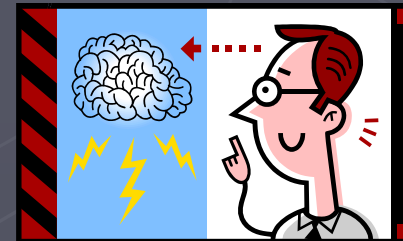
Objectives:

- ▶ highlight features of biological & hence, cognitive maturation;
- ▶ place student decision-making in a context with development;
- ▶ dialogue opportunities to create learning based on brain abilities.



Emerging Science: Brain Imaging

- new insights because...
- 1990's information explosion due to brain imaging techniques (e.g., CT, PET and MRI)

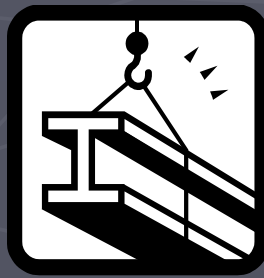


Emerging Science: Brain Imaging

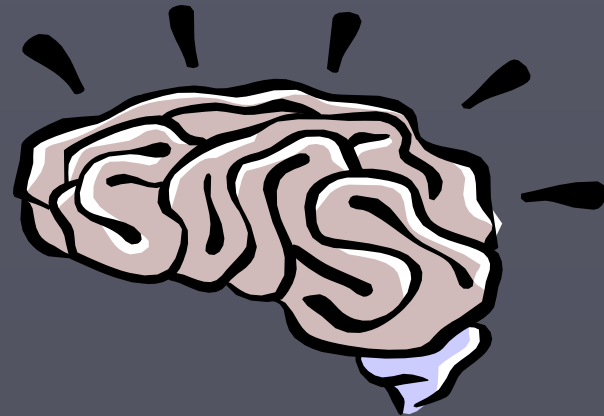
- ▶ these brain imaging techniques produce windows to observe:
 - ▶ how the brain develops;
 - ▶ what happens as decisions are made;
 - ▶ how the brain adapts to injury;
 - ▶ differences in brain responses between adults & adolescents;
 - ▶ the effects of substances on the brain;

Emerging Science: Adolescent Brains Are Still “Under Construction”

- new insights about:
 - why young people take risks and display poor judgment;
 - how adolescents may be highly vulnerable to questionable relationships, accidents, technical gadgetry, substance abuse...
- these findings can help program coordinators, counselors, parents, and policy makers.



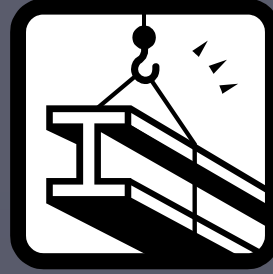
- adolescence is a period of profound brain maturation;
- we *believed* brain development was complete by adolescence;
- the young brain responds to certain events, cues or stimuli differently than adults;
- we now know... maturation is not complete until about age ???



An Immature Brain = Less Brakes on the "Go" System



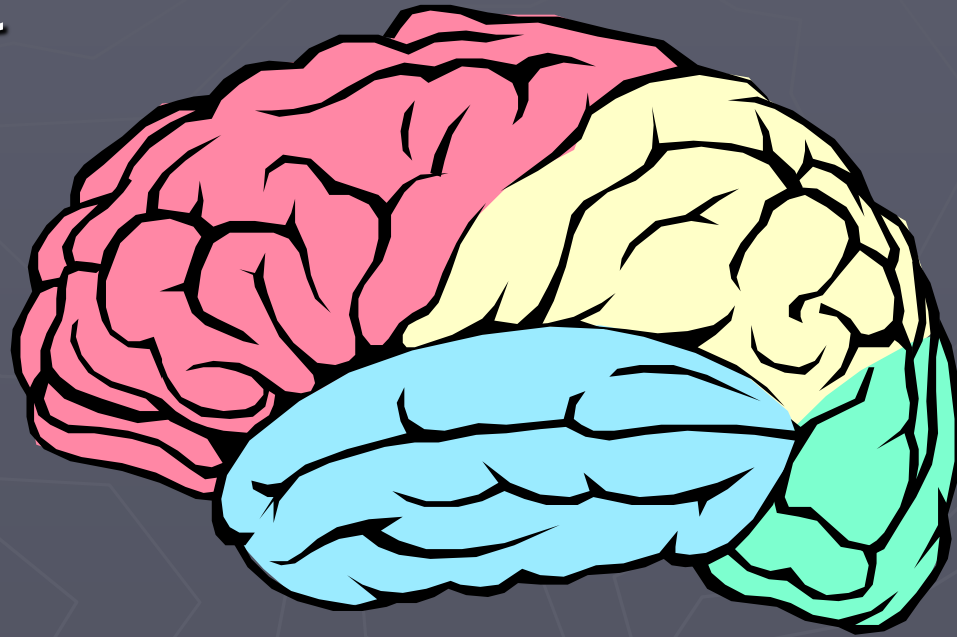
Construction Ahead:



- growth of the brain's nerve cells (neurons) occurs through late childhood
 - 1,000,000,000,000,000 possible connections;
- around 11 – GIRLS, 12½ - BOYS:
 - some of these connections are pruned off and remaining ones are strengthened.

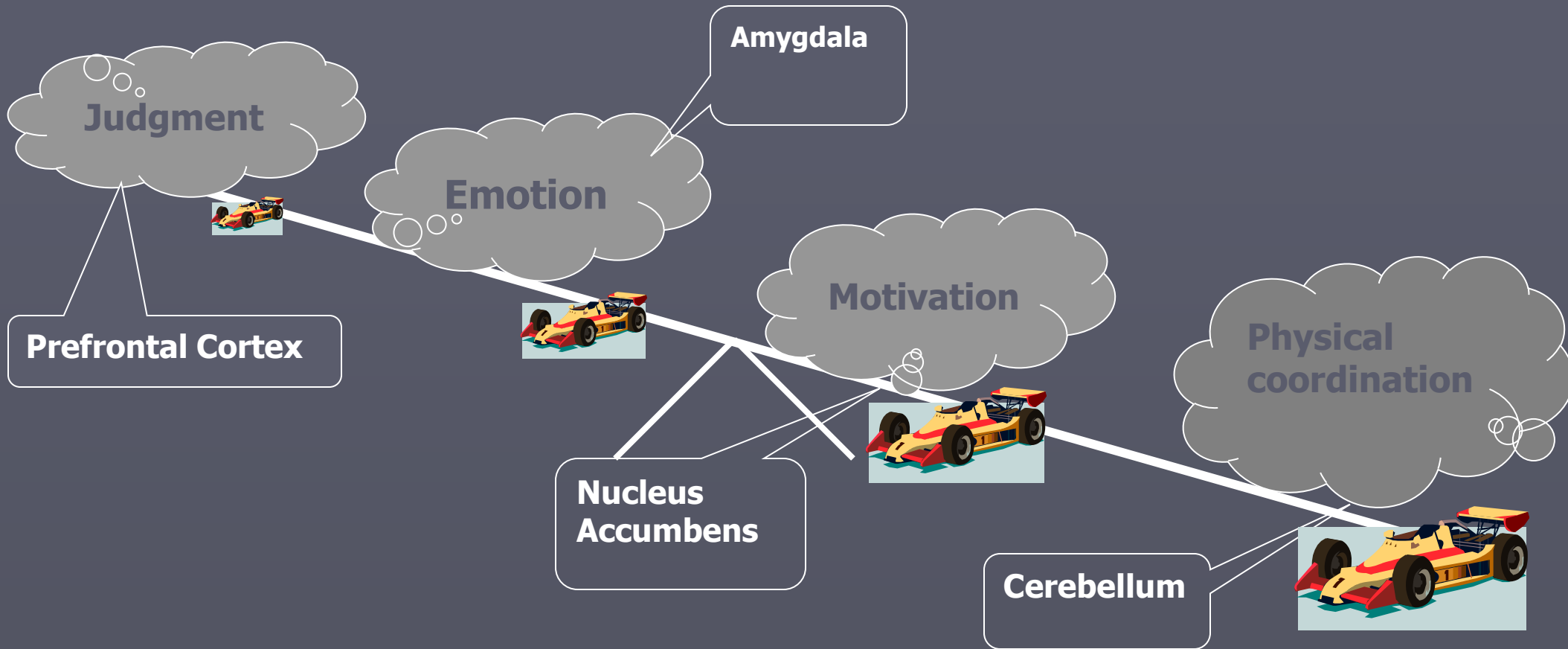
Brain Development

Back to Front



Judgment Gets Better with Age:

- by age 18, the adolescent's judgment for *structured challenges* is roughly equal to that of adults;
- judgment that *involves resisting impulses or delaying gratification* is still under construction during late adolescence and early adulthood;
- maturation starts at the back of the brain & moves to the front.



Notice: Judgment is last to develop!

Development of the Adolescent Brain:

- earlier development of the back of the brain gives rise to physical activity;
- later development of the front of the brain does not give rise to optimal assessment of risk and careful decision-making.
- this differential strength of influence may contribute to developmentally specific behavioral preferences & tendencies;

Apprentice Development & Adolescent Behavior:

we can infer.....

- preference for physical activity;
- preference for high excitement and low effort activities;
- preference for activities that trigger high intensity feelings and arousal;
- poor planning and judgment;
- minimal consideration of negative consequences;
- more risky, impulsive behaviors.
 - some evidence that being in a group accentuates impulsiveness

Therefore...

- 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;
 - irritability;
 - risk-taking;
 - proclamations of sheer boredom.

and...

- the brain undergoes considerable development during adolescence;
- the last area to develop is the prefrontal cortex, which is involved in planning, decision-making and impulse control;
- the developing brain probably gives rise to risk-taking and difficulty in controlling impulses;

SO...

- youth may be particularly vulnerable to impulse-related disorders, including AOD;
- moodiness vs. affective disorder can be a tricky dx;
- ADHD youth may be at an even greater vulnerability.

Implications of brain development...

- ▶ design programs, interventions & prevention to accommodate the youthful brain:
- ▶ responds to novelty;
- ▶ prefers “high context”
- ▶ influenced by peers;
- ▶ primed for physical activity;
- ▶ provide structure & support.

Best advise...

- ▶ Don't take the limbic brain personally!
- ▶ Don't resort to "limbic on limbic"
- ▶ Use your frontal lobe (PFC) to guide and teach
- ▶ Be present with adolescents

and finally...

- ▶ P= promote activities that capitalize on the strengths of the developing brain;
- ▶ R= reinforce seeking assistance from adults & teach decision-making;
- ▶ E= establish early prevention/intervention strategies via embedding in all programs;
- ▶ V= vary experiences, teaching styles & media use;
- ▶ E= encourage lifestyles that promote healthy brain development;
- ▶ N= never underestimate culture, AOD, peers, etc.;
- ▶ T= tolerate “oops” behaviors due to an immature brain.

Contact info:

Susan Scholl, MS, MS, CASAC, NCACII, CAS, CHES

Syracuse University

David B. Falk College of Sport & Human Dynamics

Dept. of Public Health, Food Studies & Nutrition

426 Ostrom Avenue

Syracuse, NY 13210

315-443-8436

sascholl@syr.edu