

Adolescent Well Being and the Biopsychological Effects of Nutrition, Sleep, and Technology

10/26/17

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Agenda

- Objective
- Adolescent Brain vs. Adult Brain
- Why These Differences in Development Matter
- Factors Affecting Development
- Implications
- Recommendations
- Conclusions
- References

Objective

- To have a better understanding of how nutrition, sleep, and technology affect adolescents' physical and emotional health, their developing brain, and thereby their learning.

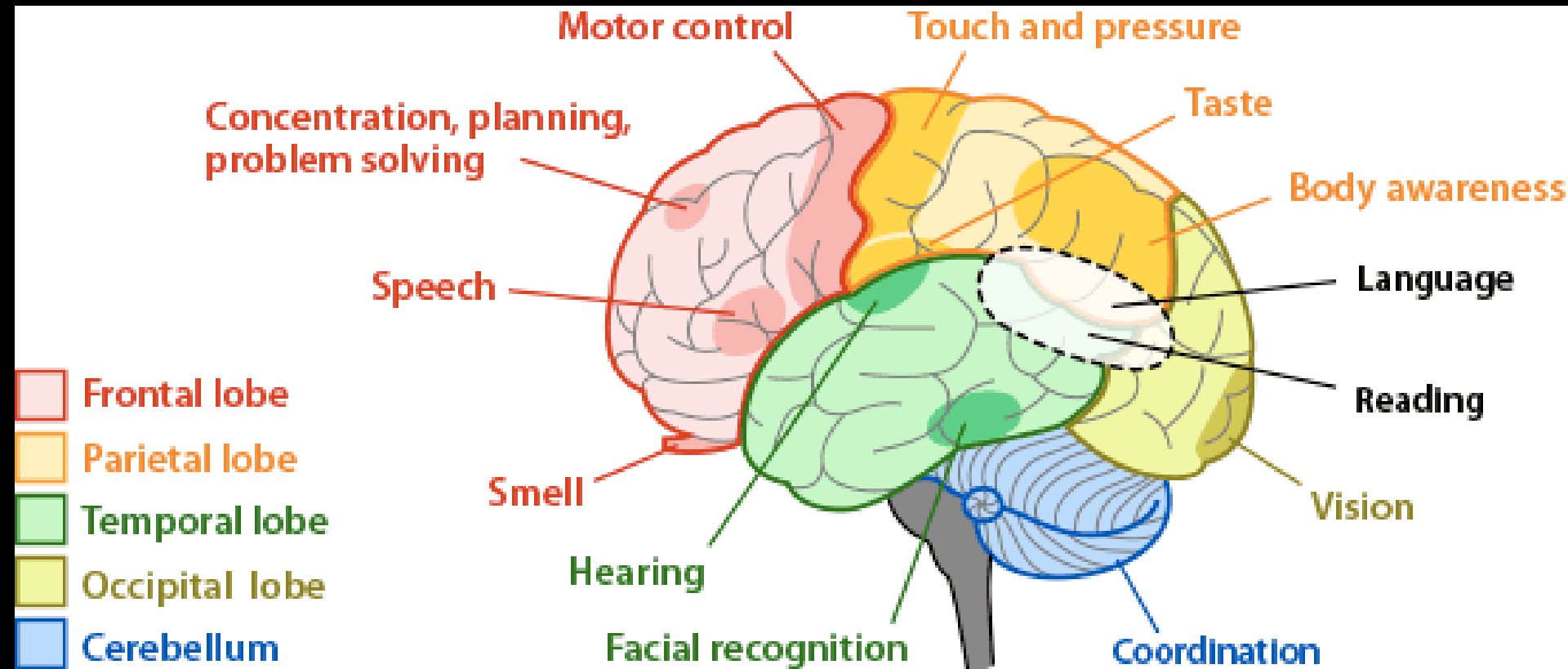


Development

“Physiological adolescence ranks with the fetal period and infancy as a time of extremely rapid biological change.”

Craig & Baucum

Adolescent Brain vs. Adult Brain



BRAIN HIERARCHY

FRONTAL LOBE

- *Abstract Thinking
- *Problem Solving
- *Reasoning
- *Executive Functioning
- *Organizing
- *Motor Functions
- *Regulates Emotions
- *Expressive language

FUNCTIONS

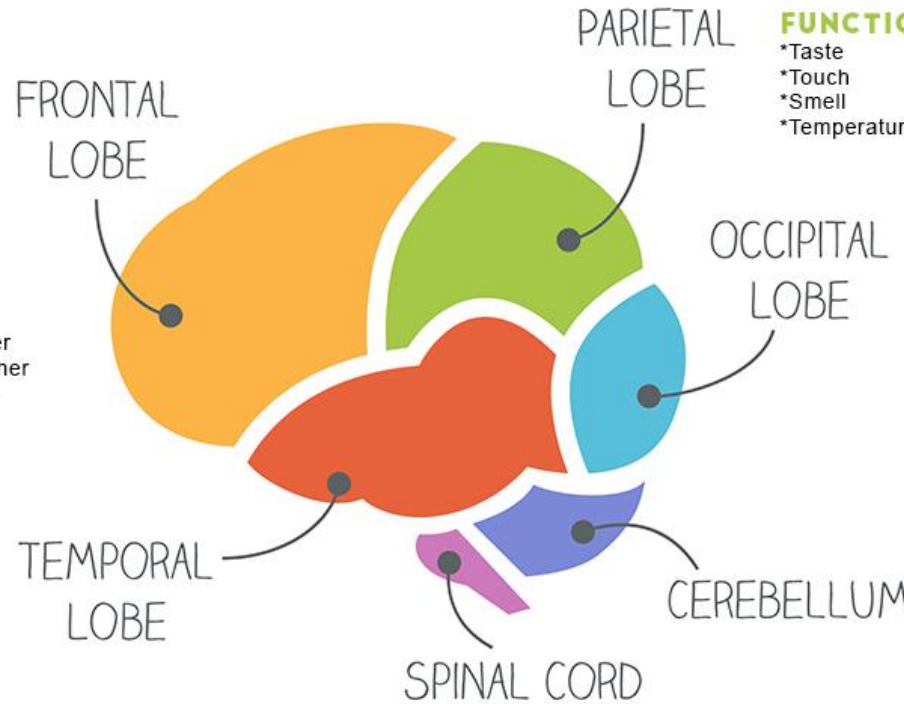
- *Organizes thoughts on paper
- *Remembers facts from teacher
- *Starts and completes tasks
- *Tells stories

TEMPORAL LOBE

- *Speech
- *Auditory Processing
- *Hearing
- *Behavior
- *Emotions
- *Short-Term memory
- *Long-term memory

FUNCTIONS

- *Processes what the teacher teaches
- *Fear
- *Fight or Flight
- *Retains Facts



PARIETAL LOBE

- *Sensory Information

FUNCTIONS

- *Taste
- *Touch
- *Smell
- *Temperature

OCCIPITAL LOBE

- *Visual System
- *Visual Information

FUNCTIONS

- *Processes words on a page
- *Knows shapes and sizes
- *Recognizes letters
- *Knows left from right

CEREBELLUM

- *Balance
- *Coordination
- *Attention
- *Rhythm
- *Proprioception
- *Vestibular

FUNCTIONS

- *Kick a ball
- *Throw a ball
- *Jump on one foot
- *Ride a bike





3 weeks



4 weeks



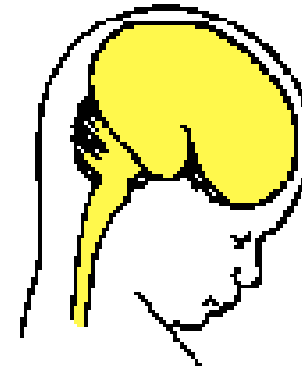
5 weeks



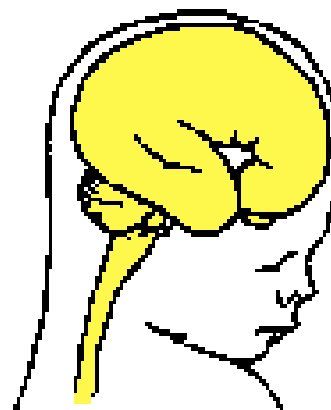
7 weeks



11 weeks



4 months



6 months



8 months



Newborn

Better with Age

16-20 YEARS
OLD

It handles more
complex reasoning

10-15 YEARS
OLD

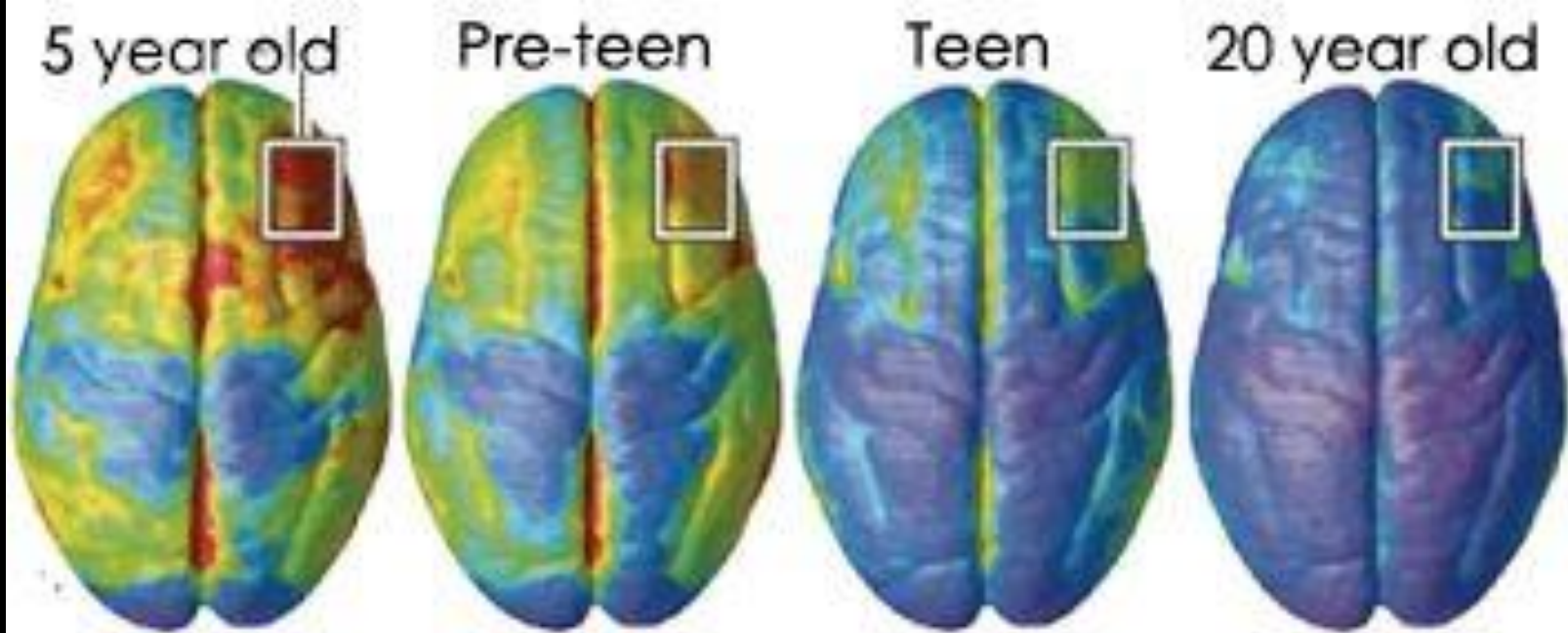
It's better equipped to plan,
retain, solve, control emotions

9 YEARS
OLD

Its circuitry is fine-tuning



THE HUMAN BRAIN



Red/yellow:
Less mature

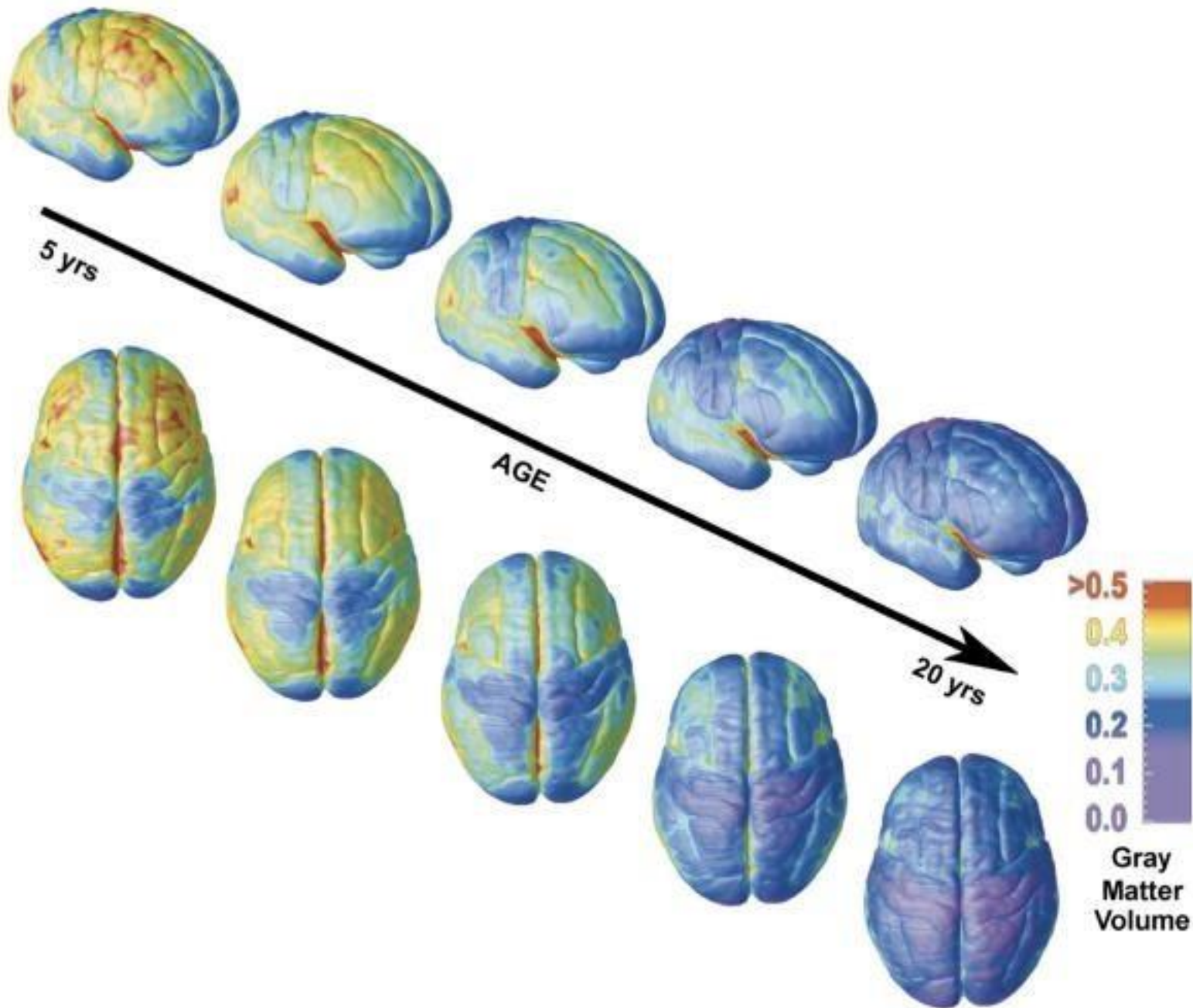


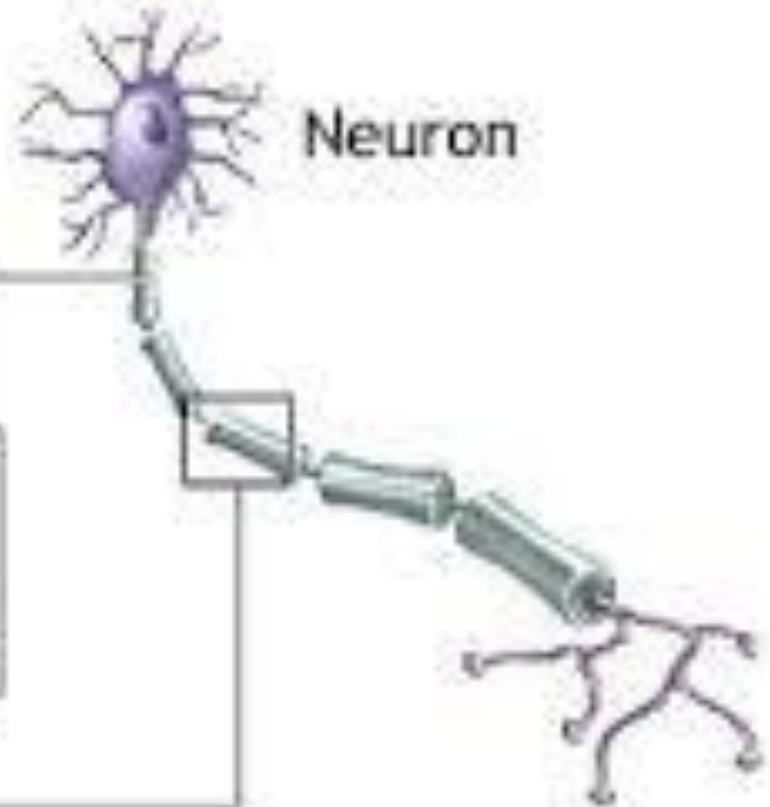
Blue/purple:
More mature

Dynamic mapping of human cortical development



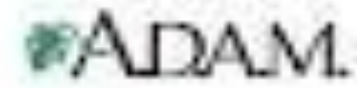
Source: "Dynamic mapping of human cortical development during childhood through early adulthood," Nitin Gogtay et al., Proceedings of the National Academy of Sciences, May 25, 2004; California Institute of Technology.



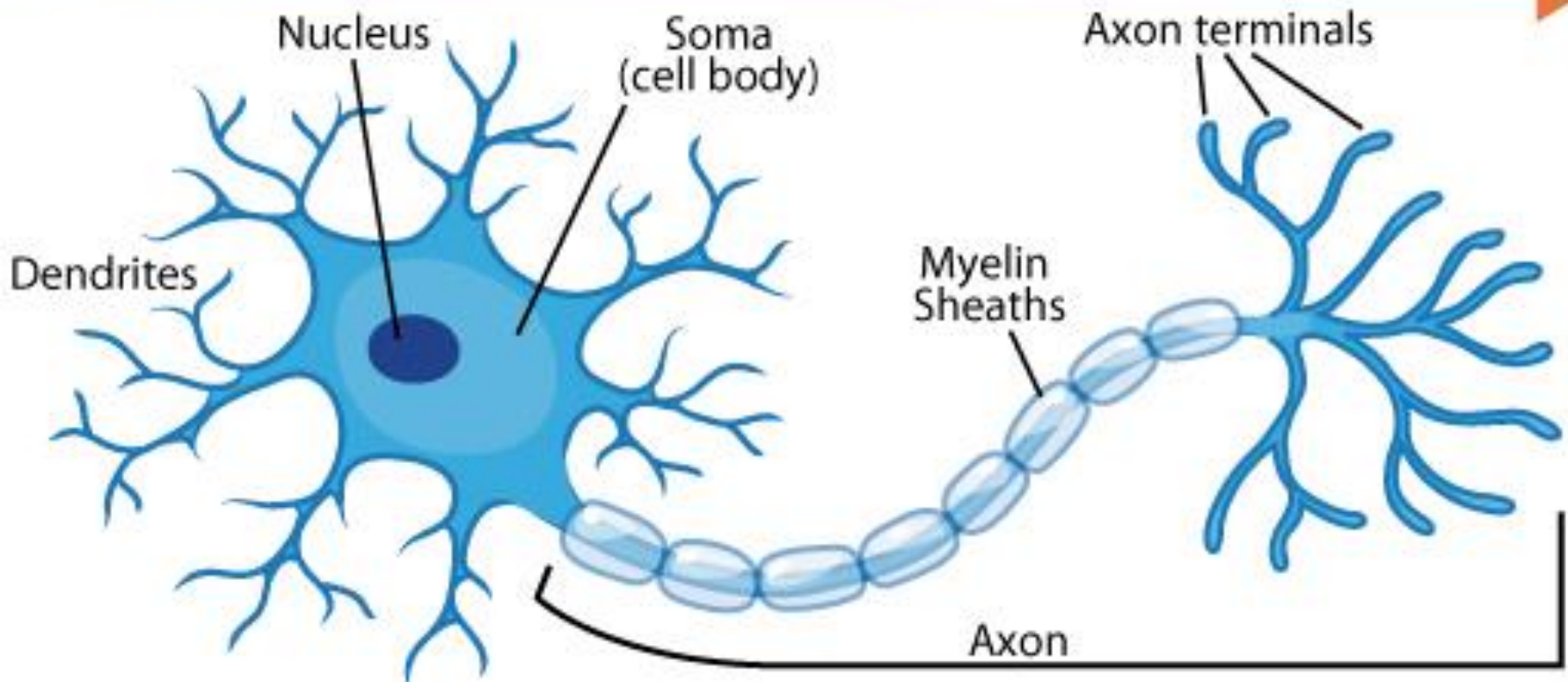


Myelin sheath

www.nortonhealthcare.adam.com

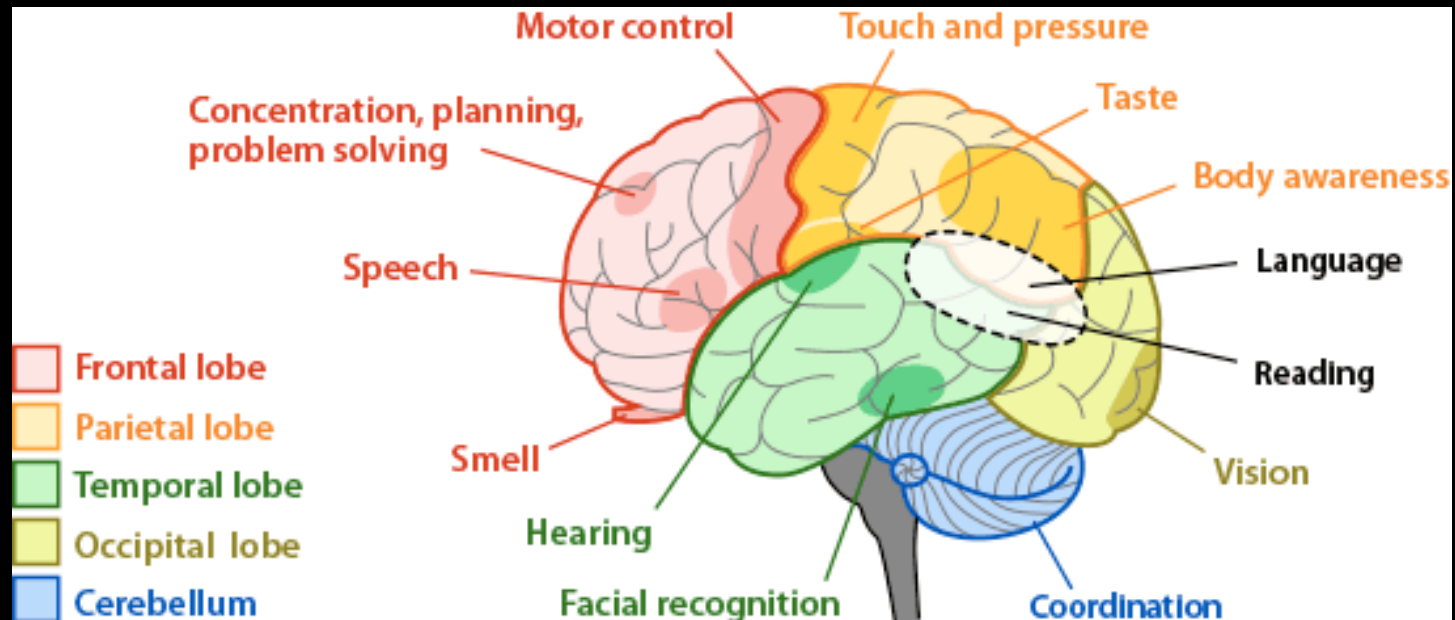


Direction message travels



Why These Differences Matter

- Executive function
- Cognitive control
- Social cognition



Factors Affecting Development

- Nutrition
- Technology
- Sleep



- Which effects do they have in common?
 - Emotional and behavioral changes
 - Cognitive and memory impairments
 - Suppressed immune system

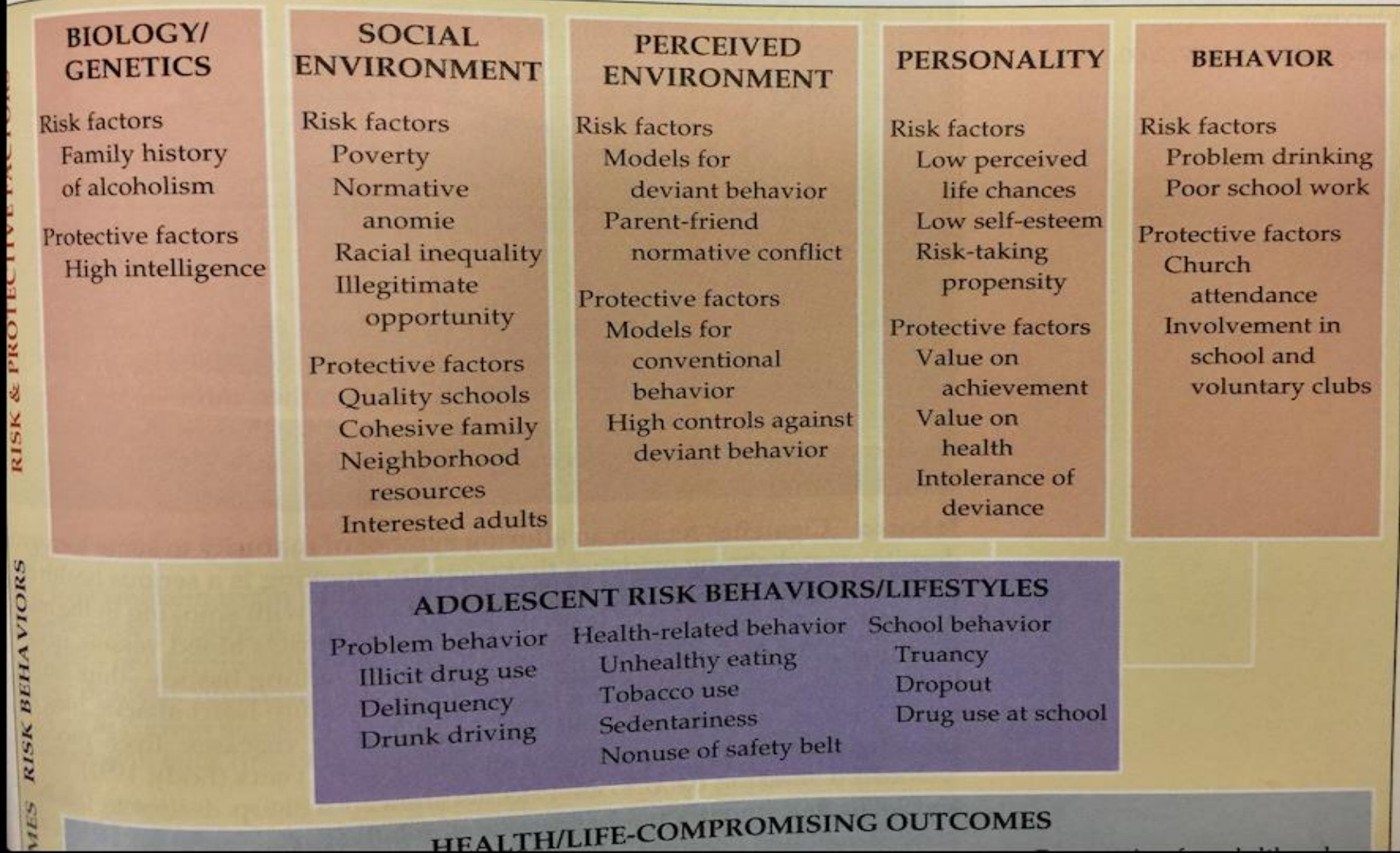


Implications

- Adolescent Brain
- Adolescent Learning
- Adolescent Physical & Emotional Health



1992, in *Adolescents at Risk: Medical and Social Perspectives*, edited by D. F. Rogers and E. Ginzberg.
 printed by permission of Richard Jessor.



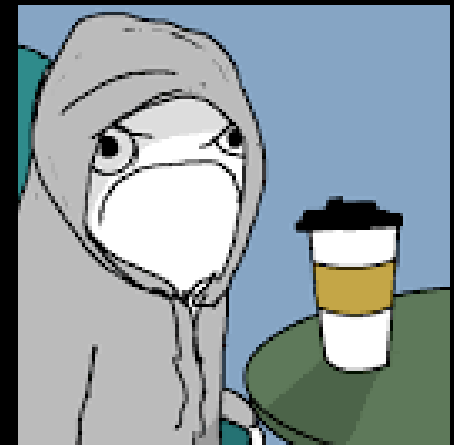
Recommendations

Parenting style: Authoritative Parents

- High degree of control and warmth
- Reasonable limits
- Listen to children's concerns
- Flexible when appropriate

Recommendations: Nutritional & Physical

- Stress management
- Exercise earlier in the day or early evening
- Avoid caffeine 4-6 hours before bedtime
- Healthy diet
 - High in fruits, vegetables, whole grains, nuts, seeds
 - Low in fat, eggs, meat, dairy
 - Drink plenty of water



EDICIÓN ACTUALIZADA

Martha Alicia Chávez



Tu hijo, tu espejo

Un libro para padres valientes

Grijalbo

Technology

“The New member of the family”

“Do not let technology be the Director and Star of your movie.”

“Remember YOU are the authority.”

Dr. Chavez

Warning!

According to Dr. Chavez, many studies show the risks of electromagnetic side effects, but the studies are repressed.

The side effects may take up to 20 years to show in the brain (tumors).

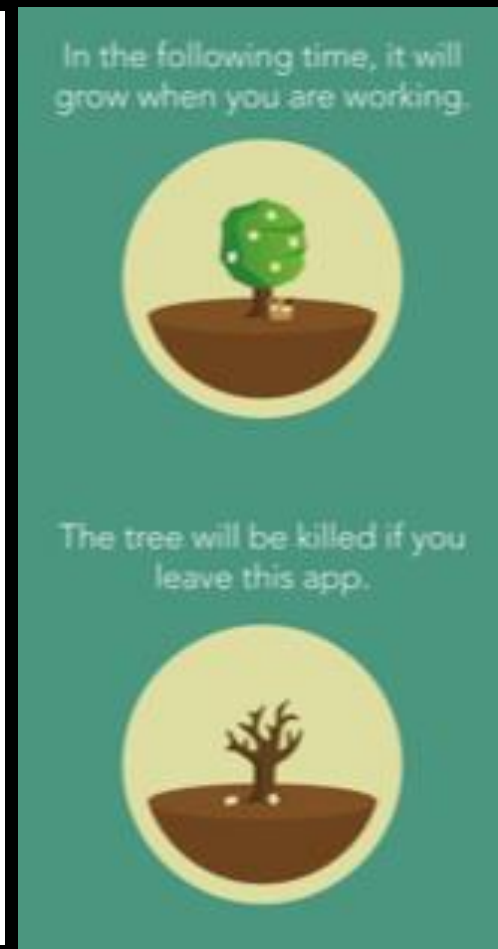
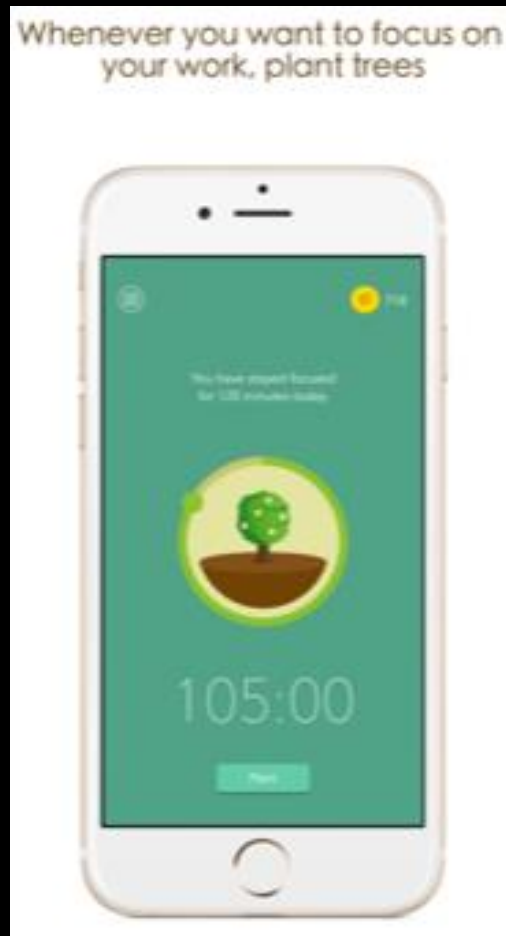
Additional Risks

- 80% higher probability of conduct issues.
- 25% higher risk of emotional problems.
- 34% higher incidence of interpersonal issues.
- 35% higher incidence of hyperactivity.

- One Hour of use is recommended

Recommendations: Tech Tips

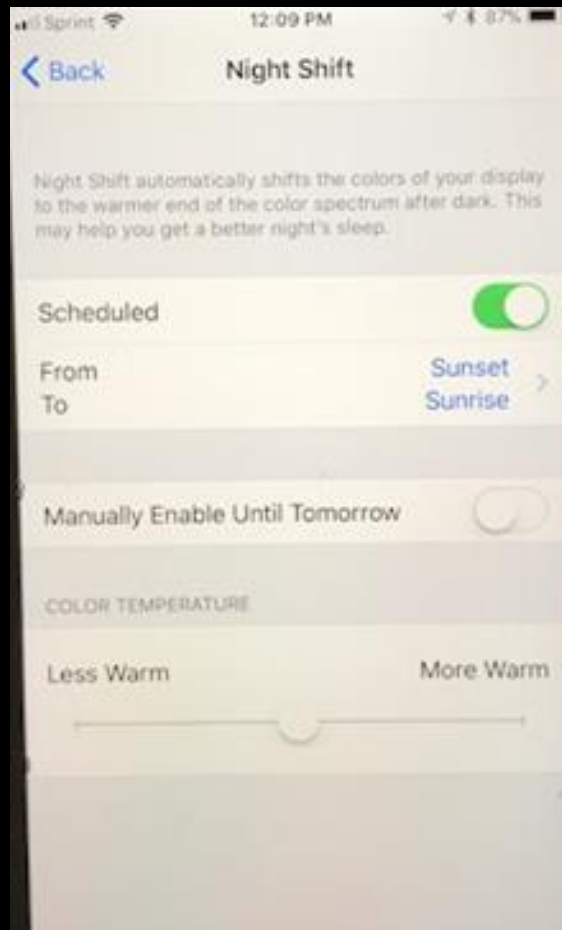
- Apps that help decrease phone usage
 - Forest
 - Checky



Recommendations: Tech Tips

(continued)

- Night Shift function



Recommendations: Tech Tips

(continued)

- f.lux
- Twilight
- Fitness tracker
- Avoid devices at least 30 minutes to 1 hour before bedtime (ideally 2 hours before)



Scarcity

Why Having
Too Little
Means So Much

Sendhil Mullainathan
and Eldar Shafir

Scarcity of Sleep

2 Groups: Subjects with normal sleep time.

Subjects with no sleep time.

Both groups were given a Raven's test and the sleep deprived scored lower.

Dr. Mullainathan&Shafir

Recommendations: Sleep Hygiene

- Consistent bedtime
- Get enough sleep (8-10 hours)
- Self care routine (shower, skin care)
- Sleep cool (around 65 degrees Fahrenheit)



Recommendations...

- Limit TV and electronic devices before bedtime.
- Adolescents need sleep to recuperate energy, and produce necessary growth hormones.
- Strengthens immune system.

Recommendations: Sleep Hygiene

(continued)

- Relaxation routine (yoga, body scan meditation, breathing techniques)

Namasté at Night

10 Relaxing Yoga Moves For Better Sleep in Just 20 Minutes!



Hero Pose



Standing Forward Bend



Cow Pose



Cat Pose



Plow Pose



Child Pose



Extended Final Resting Posture



Legs Up On the Wall Pose



Lying Twist



Final Resting Pose

Recommendations: Sleep Hygiene

(continued)

- Comfortable bedroom (soft sheets, pillows)
- Weighted blanket
- Light-blocking curtains
- Earplugs or white noise
- Sleep mask
- Aromatherapy
- Lamp temperature at 1,800k
- **THE BEDROOM IS ONLY FOR SLEEPING**



Recommendations: Adults

- Parents set the example
- Teachers can reinforce



Conclusions

- Nutrition, sleep, and technology affect adolescents' physical and emotional health, their developing brain, and thereby their learning.
- What affects our teens affects everyone



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