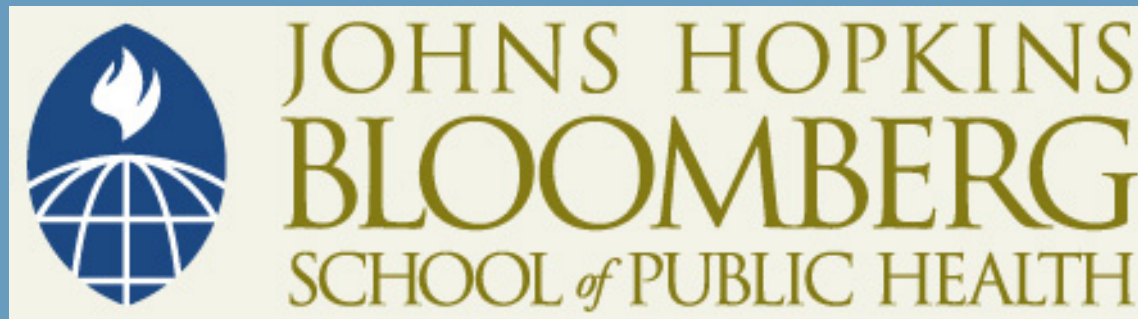


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BLOOMBERG  
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## Section B

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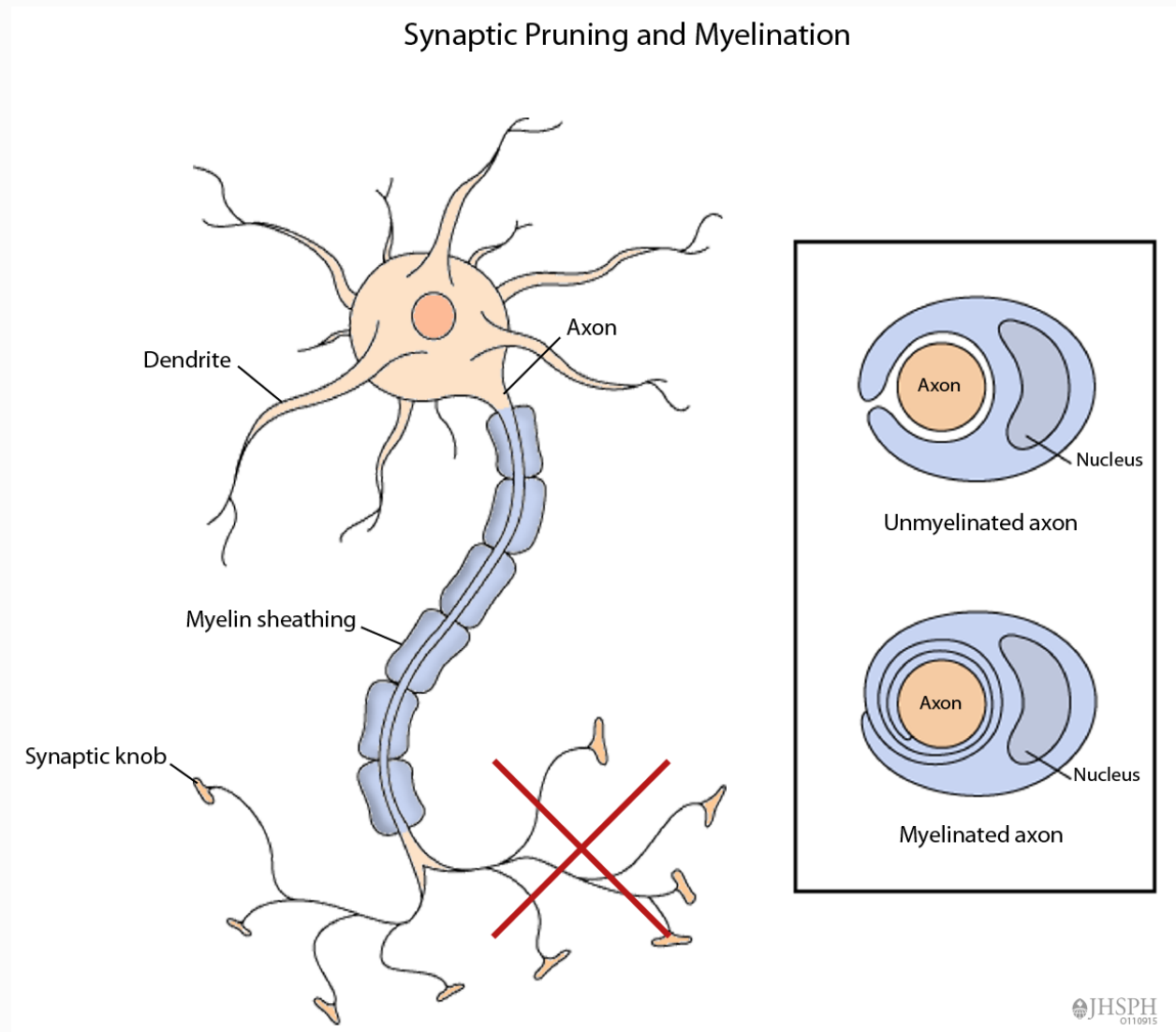
Emotional Development

# Adolescent Brain Development

- Brain development now extends into the adolescent years
- Most of this development occurs in the frontal lobe
  - Executive functions
  - Planning
  - Reasoning
  - Impulse control

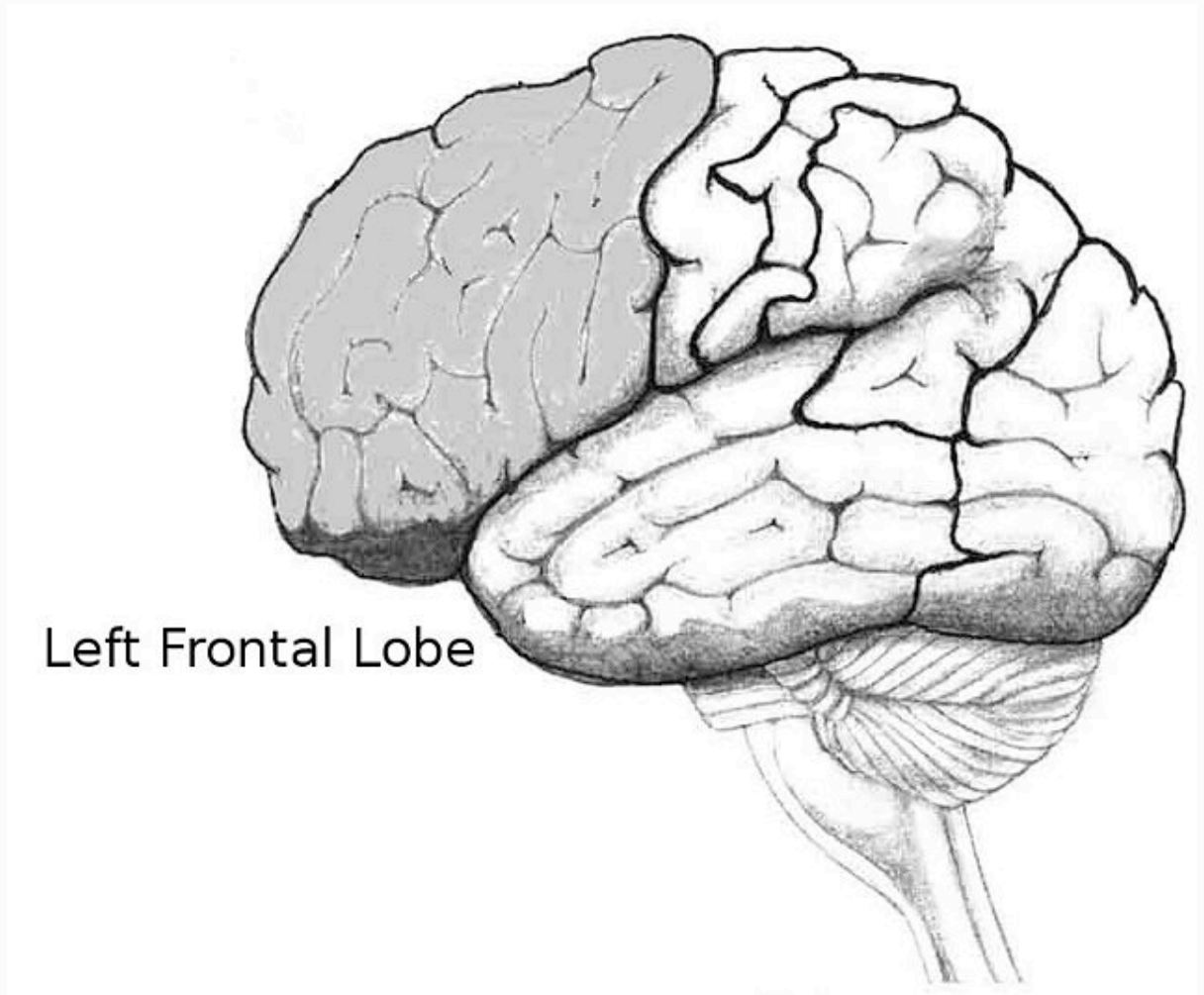
# Brain Maturation in Adolescence

- Improved brain function
  - Increased efficiency of local computations
  - Increased speed of neuronal transmission



# Frontal Lobe

- Executive function
- Planning
- Reasoning
- Impulse control



Source: [Jherding](http://commons.wikimedia.org/wiki/File:Frontallobe.jpg) at en.wikibooks. <http://commons.wikimedia.org/wiki/File:Frontallobe.jpg>

# Implications of Brain Maturation for Behavioral Development

- Changes in Pre-Frontal Cortex (PFC) should be reflected in improvements in executive functions
  - Future orientation
  - Response inhibition
  - Planning
  - Managing risk and reward

# Cognitive Development

- **Cognitive development:** the shift in intellectual problem-solving skills
- In adolescence, it is a shift from concrete to abstract thinking

# Jean Piaget



Source: [Picwiss](http://commons.wikimedia.org/wiki/File:Jean_Piaget.jpg), [http://commons.wikimedia.org/wiki/File:Jean\\_Piaget.jpg](http://commons.wikimedia.org/wiki/File:Jean_Piaget.jpg)



# Three Components of Formal Operational Logic

- Combinatorial logic

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- Combinatorial logic
- Development of a second symbolic system
- Construction of ideal, contrary-to-fact situations

# Moral Development

- Lawrence Kohlberg—moral decision making

# Moral Development

- Lawrence Kohlberg—moral decision making
  - Pre-conventional
  - Conventional
  - Post-conventional

# Moral Development

- Carol Gilligan—female moral development
  - Sociocentric
  - Egocentric
  - Reciprocal

# Affective Primacy

- The **affective system** is more primitive and more rapidly responsive than the phylogenetically newer **cognitive system**
- Cognitive reasoning is influenced by affective responses (e.g., simple likes and dislikes) that push us to approach/avoidance
  - Robert Zajonc, *Science*, 2008

# Moral Intuition vs. Moral Reasoning

- **Moral intuition** is the affective, gut-level, response to an individual or situation
  - It is an executive function that occurs in the pre-frontal cortex
- **Moral reasoning** is a cognitive process that takes place in the cortex
  - It is often a post-hoc process used to support our intuition

# A Moral Dilemma

- Would you smother your baby if it were the only way to keep it from crying and giving away your hiding place to enemy soldiers who would kill everyone with whom you are hiding if you were discovered?



# Overriding Moral Intuition

- Verbal reasoning
- Reframing
- Process the situation with other people

# Morality and Public Perception are Intertwined

- Moral reasoning is often about **framing** moral intuition—it is the public presentation of a moral decision
- **Morality and reputation** are closely connected—in social communities decisions perceived as selfish are frequently punished (e.g., through social isolation)

# Social Cognition

- **Social cognition** is the shift in social problem solving
- In adolescence, it is a shift from egocentrism to mutuality
  - Existence
  - Need
  - Inference

# Future Time Perspective

- **Future time perspective** is the capacity to envision a future and project one's self in it
  - A personal sense of time
  - Time as an abstraction

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- **Future time perspective** is the capacity to envision a future and project one's self in it
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  - Time as an abstraction
  - Future options