

# Effects of Early Adversity & Trauma

Psychology 134K  
Spring 2023  
Week 2, Class 2

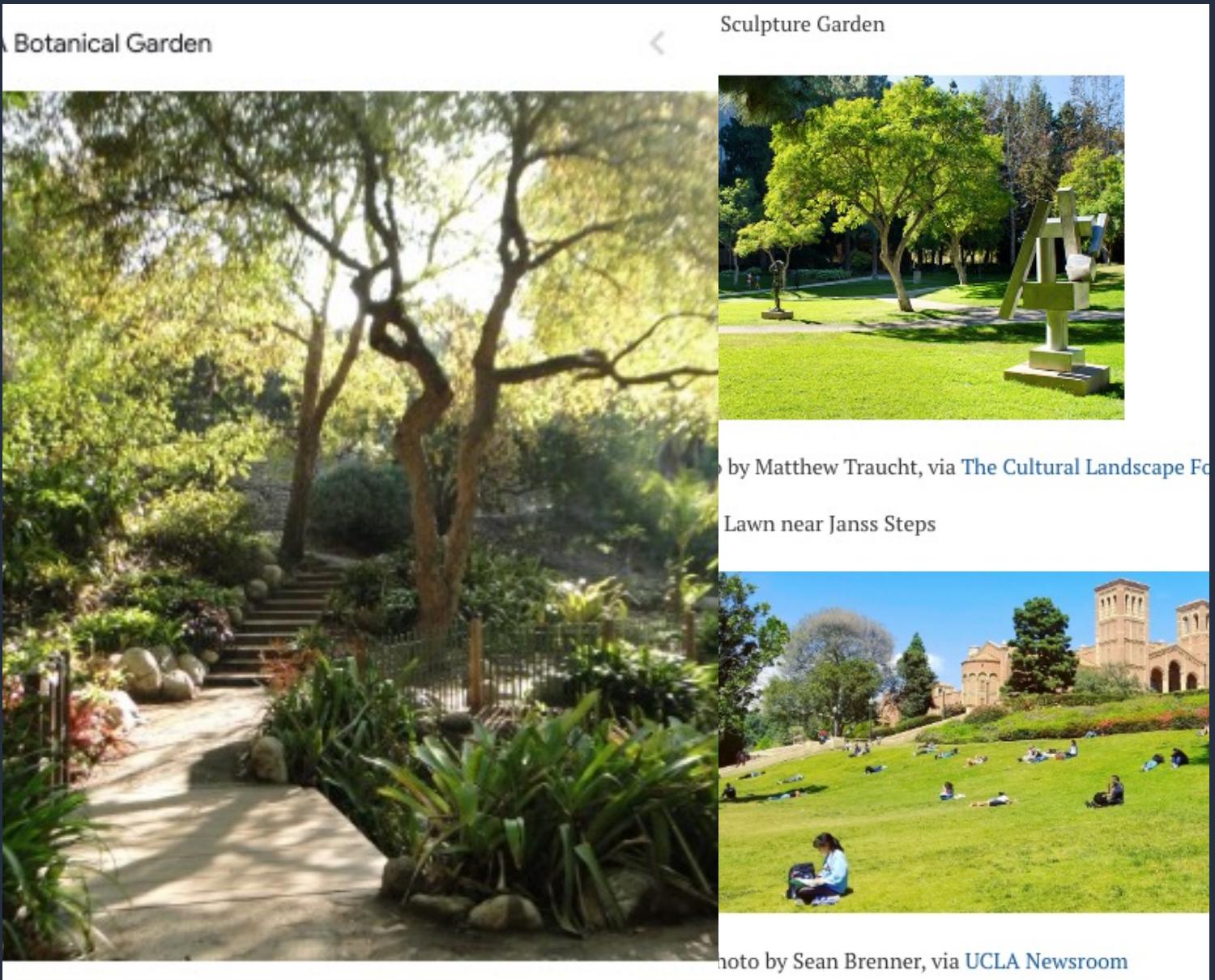
# PSNS Hack of the Day (Balban et al., 2023)

“Green Stimulus” (AKA nature) (Bratman et al., 2015; Jo, Song & Miyazaki, 2019)

- Being in nature for 1 hour can activate the PSNS, thus reducing anxiety and rumination, as well as cognitive benefits



UCLA has green stimulus!



Just looking at pictures of nature works, too.

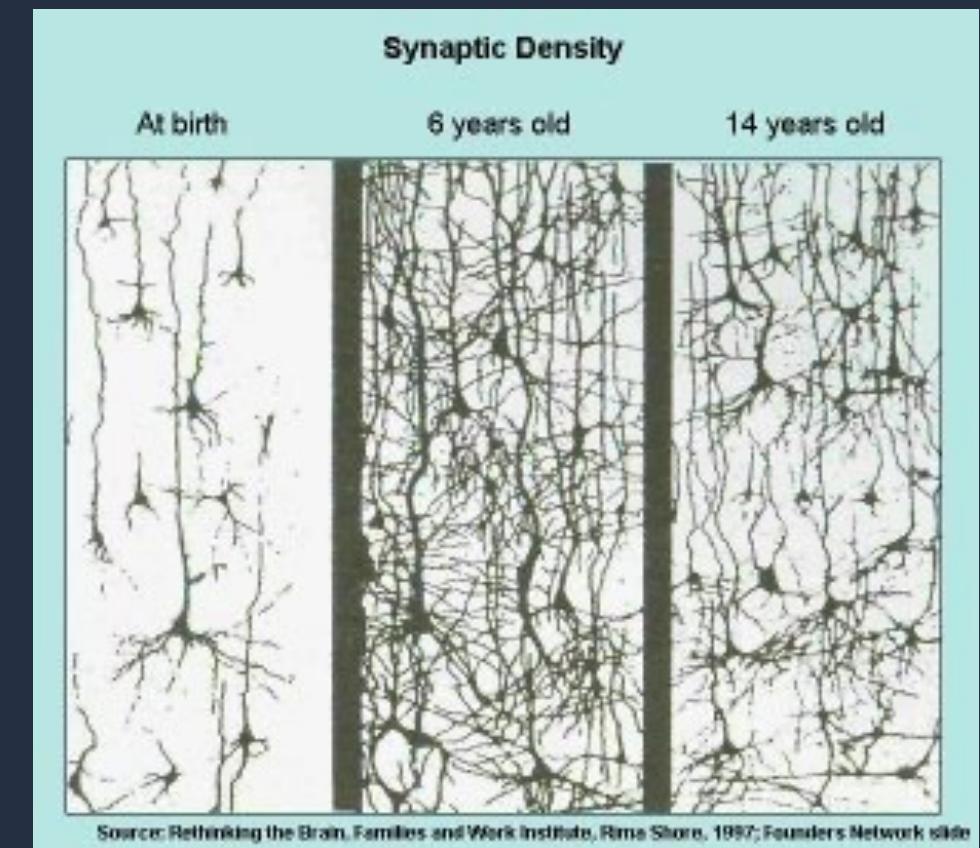
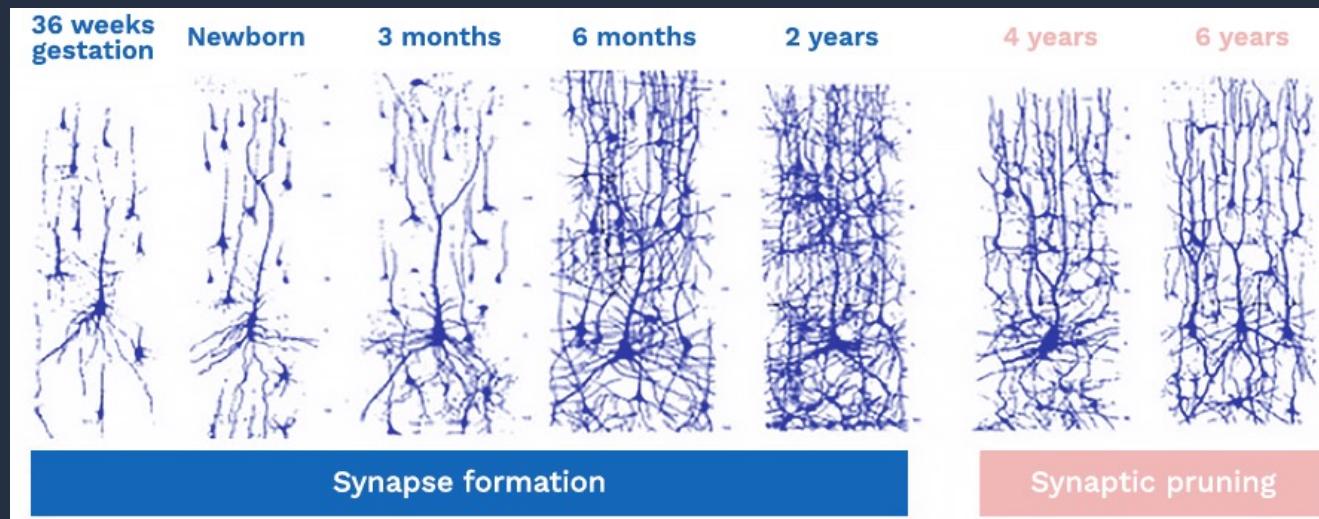


(sean hobson/Flickr)

# Effects of Early Adversity & Trauma

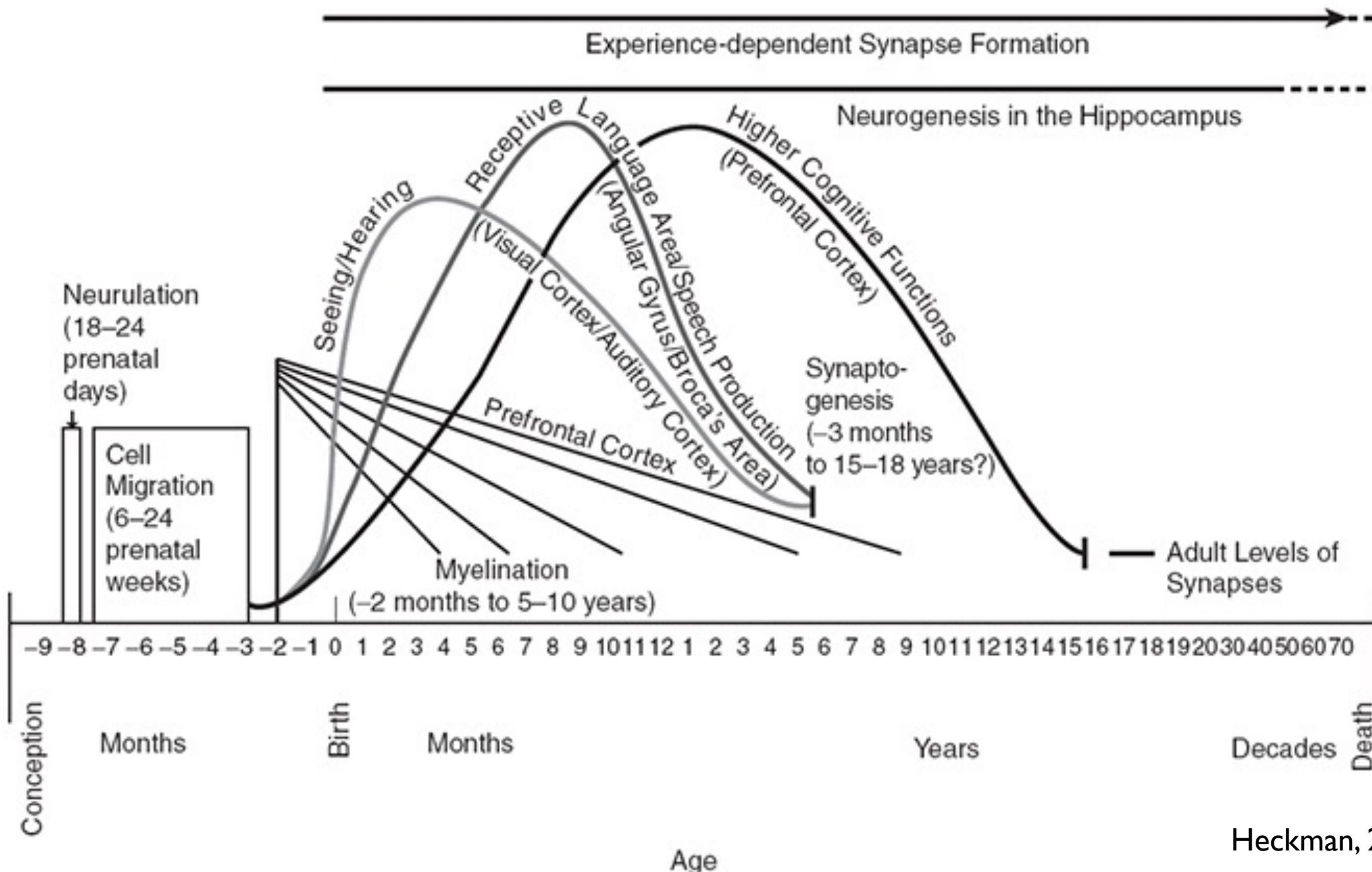
## Early Neural Development

# Neural Development (clarification)



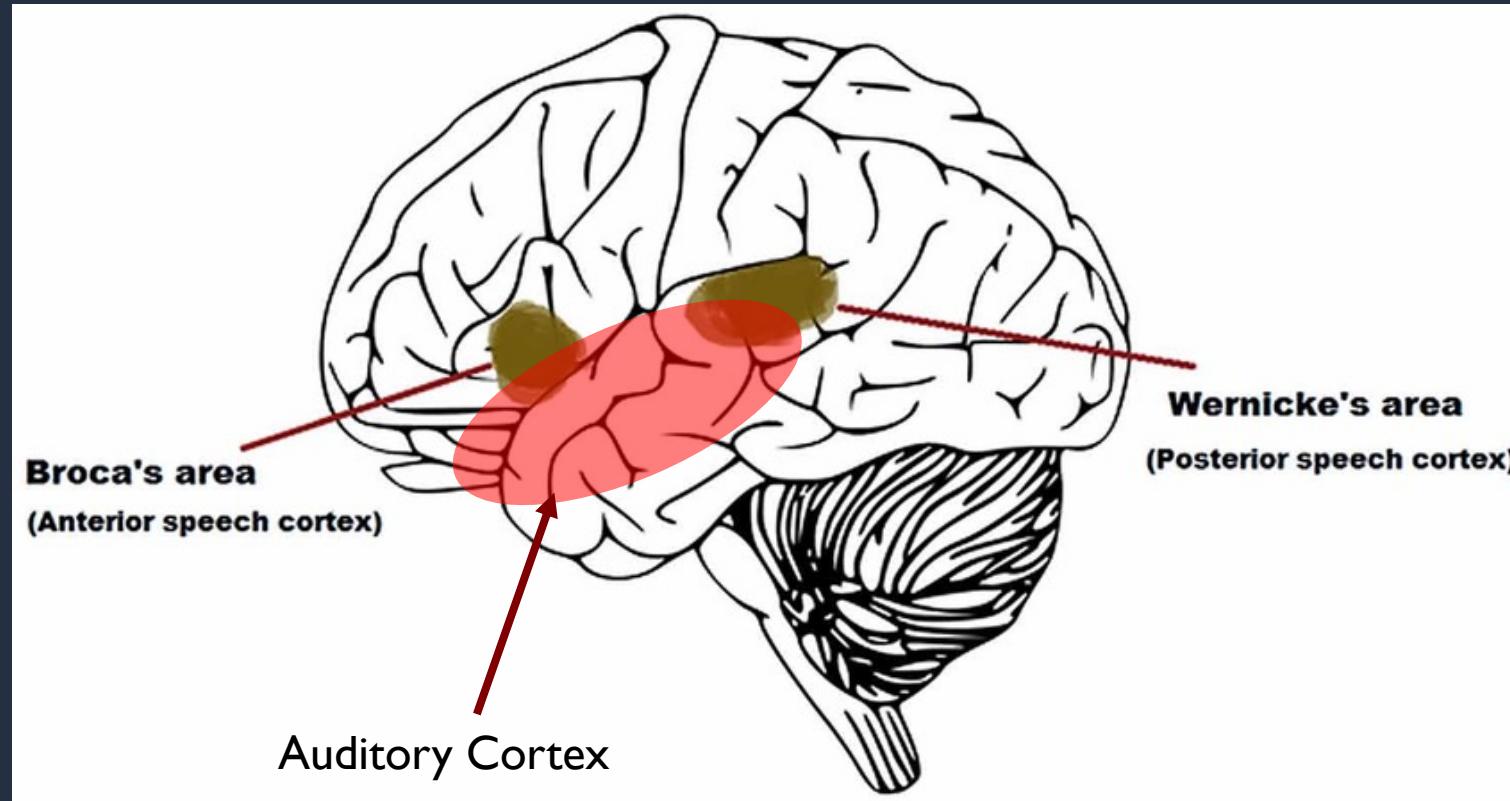
Source: Rethinking the Brain, Families and Work Institute, Rima Shore, 1997; Founders Network slide

# Human Brain Development

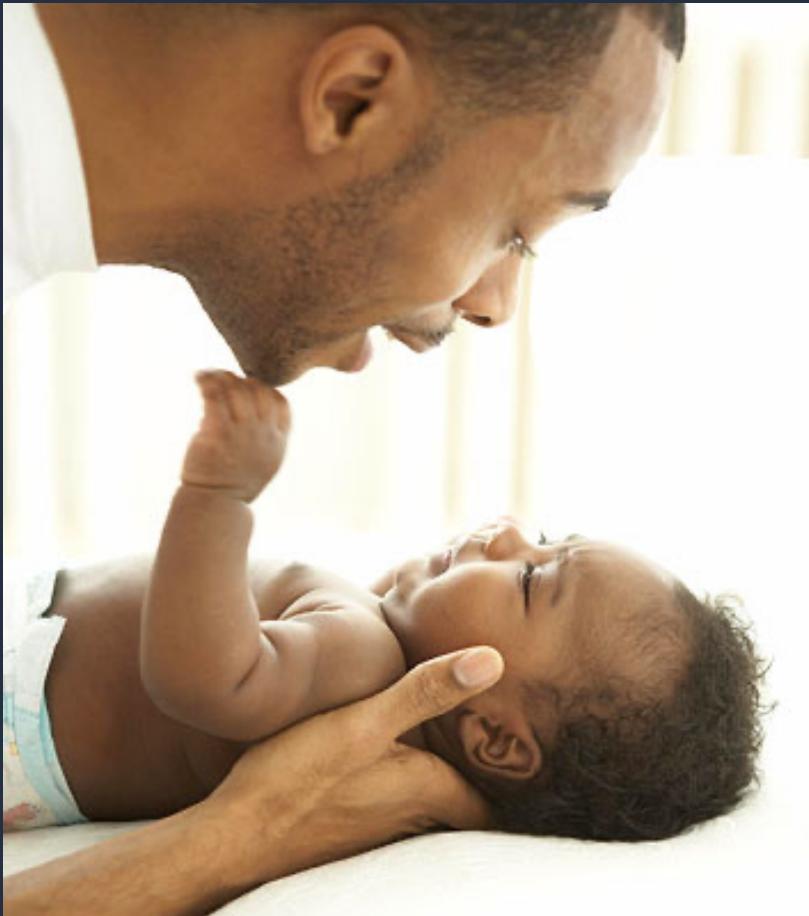


Heckman, 2013

# Language Development (experience-expectant)



# Language Development (experience-dependent)



Which language(s)  
do we encounter  
in early life?

# Language Development (sensitive periods)

Are these two sounds the same or different?

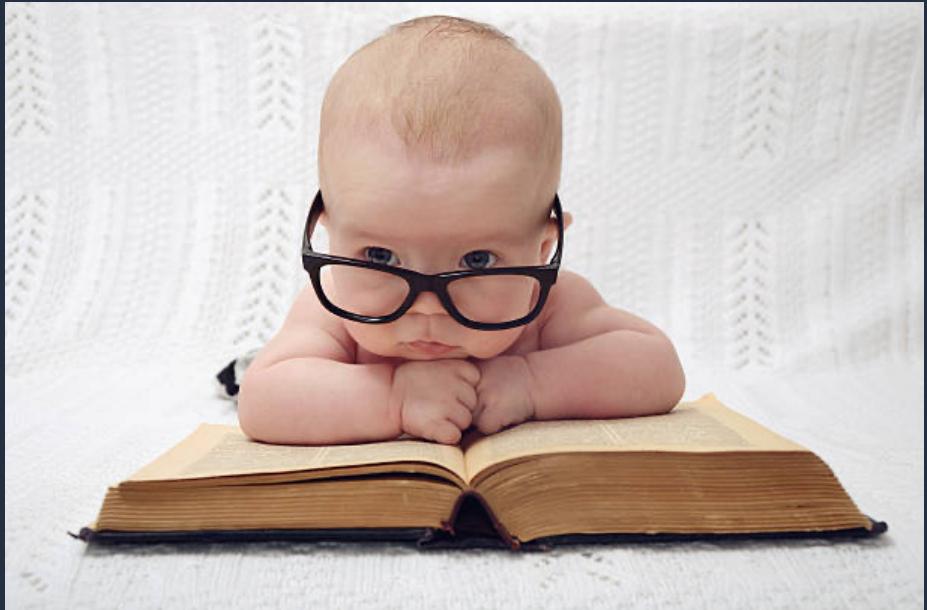


Example 1

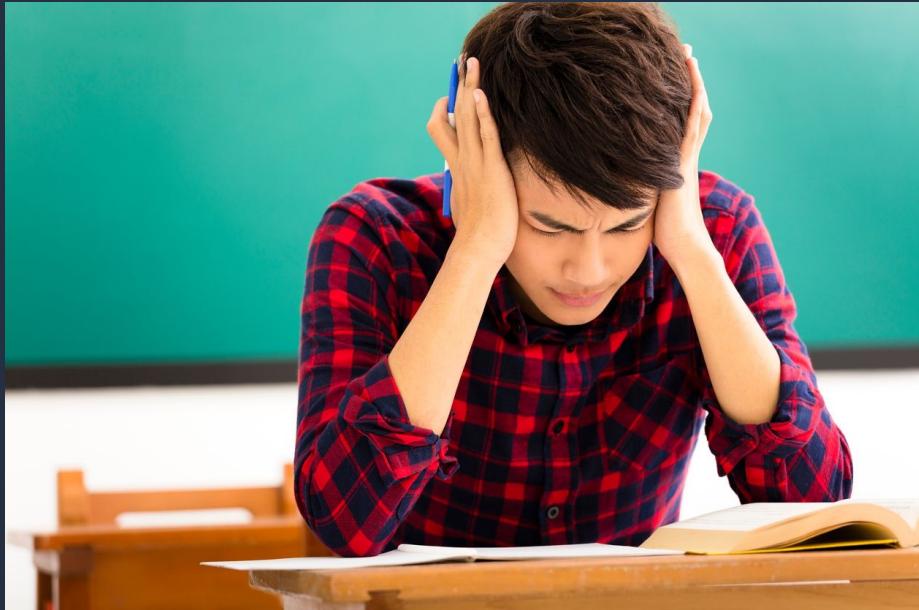


Example 2

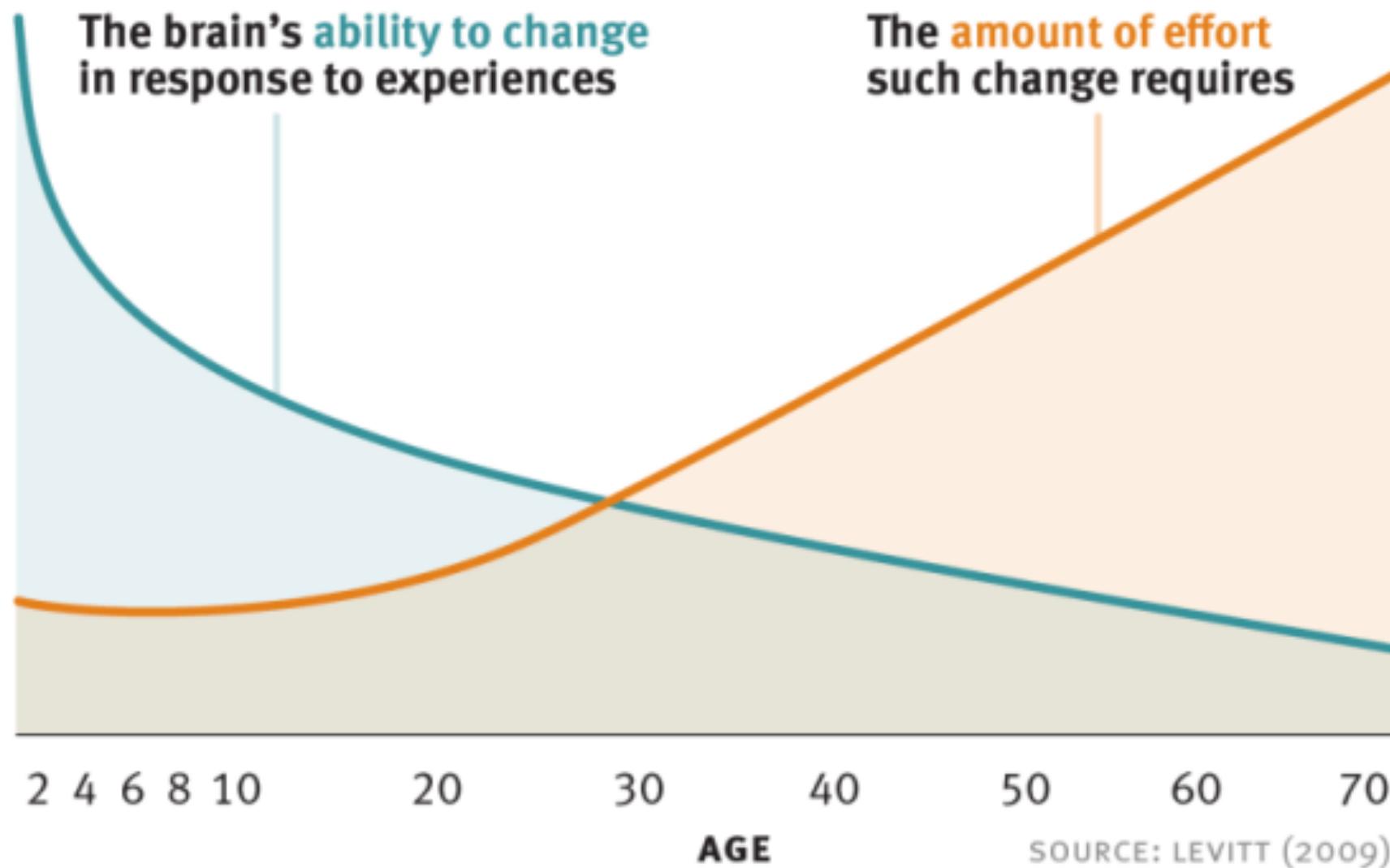
# Language Development (sensitive periods)



vs.



When do we encounter language(s)?

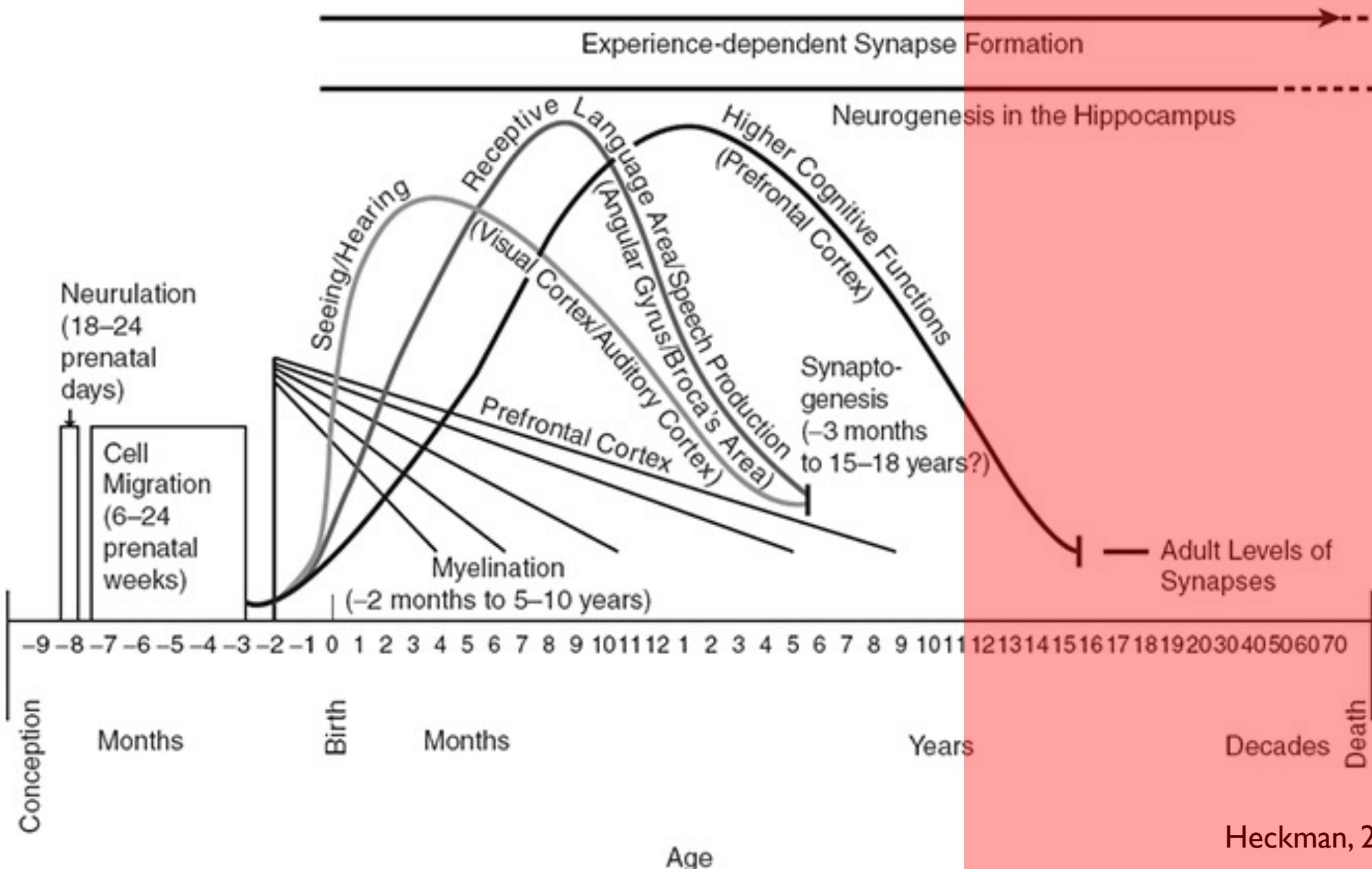




“Genie”



# Human Brain Development



# Sensitive/Critical Periods

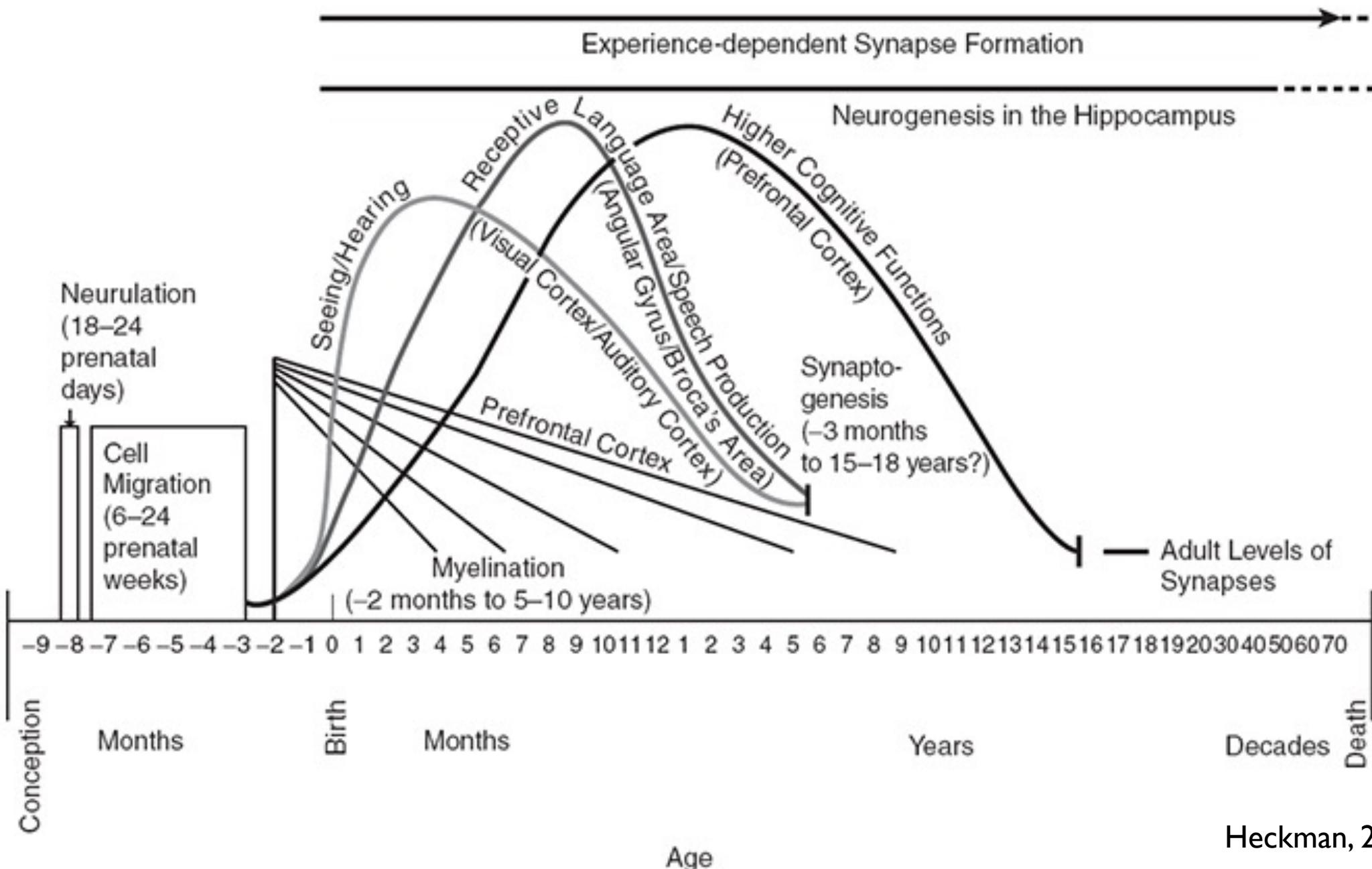
- Not all systems are constrained by sensitive/critical periods
  - eg. Learning & Memory
- Why not just keep sensitive/critical periods open forever?
  - system craves stability
- Can sensitive/critical periods be reopened?
  - we're working on it

# Sensitive/ Critical Periods (summary)

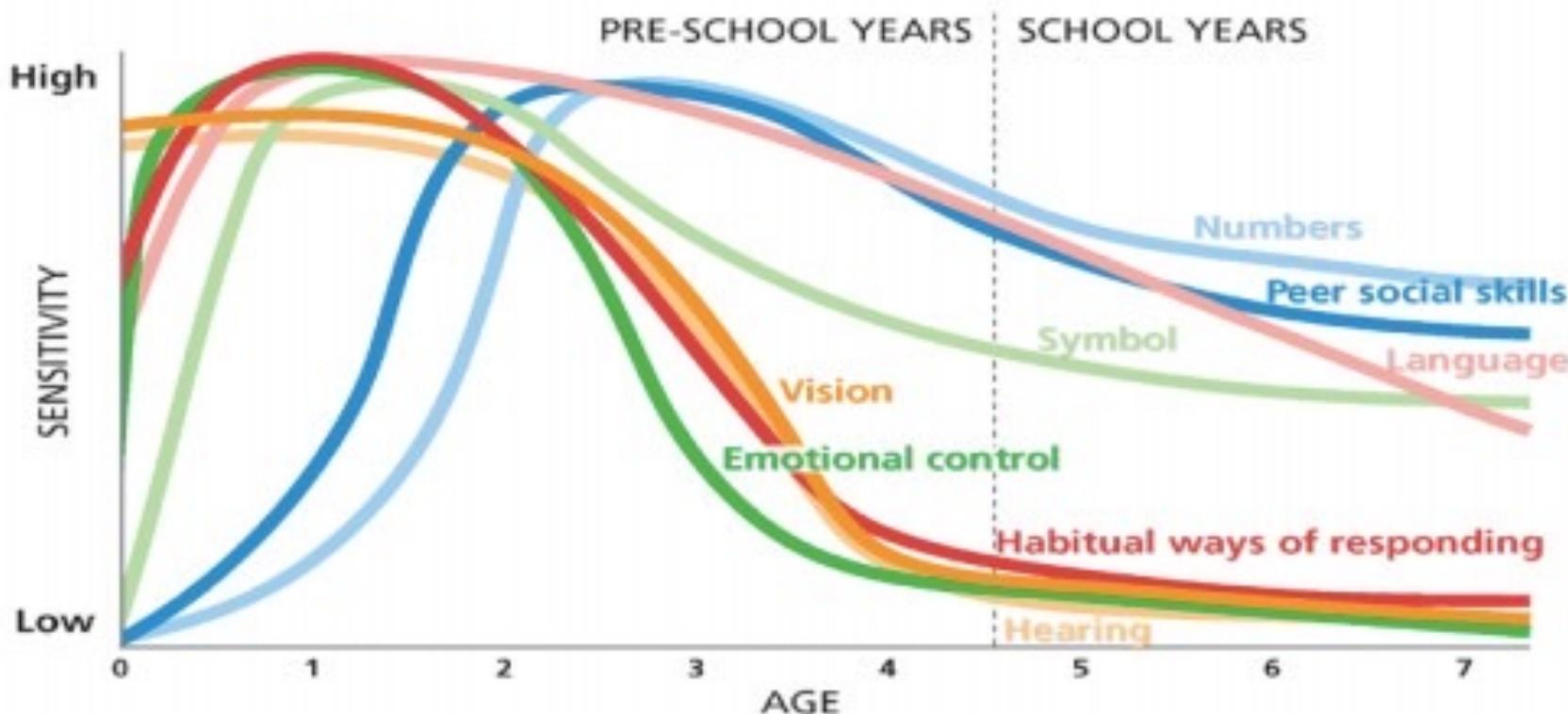
- The developing brain is heavily shaped by the environment and experiences.
- Early brain development is characterized by sensitive periods – a time of exceptional sensitivity to the effects of environment and experience.
- It is far more difficult to alter neural circuits substantially after their sensitive periods have ended, thus experiences during sensitive periods play an exceptionally important role in shaping the capacities of the brain.

What does this have to do  
with early-life stress?

# Human Brain Development



## Sensitive Periods in Early Brain Development

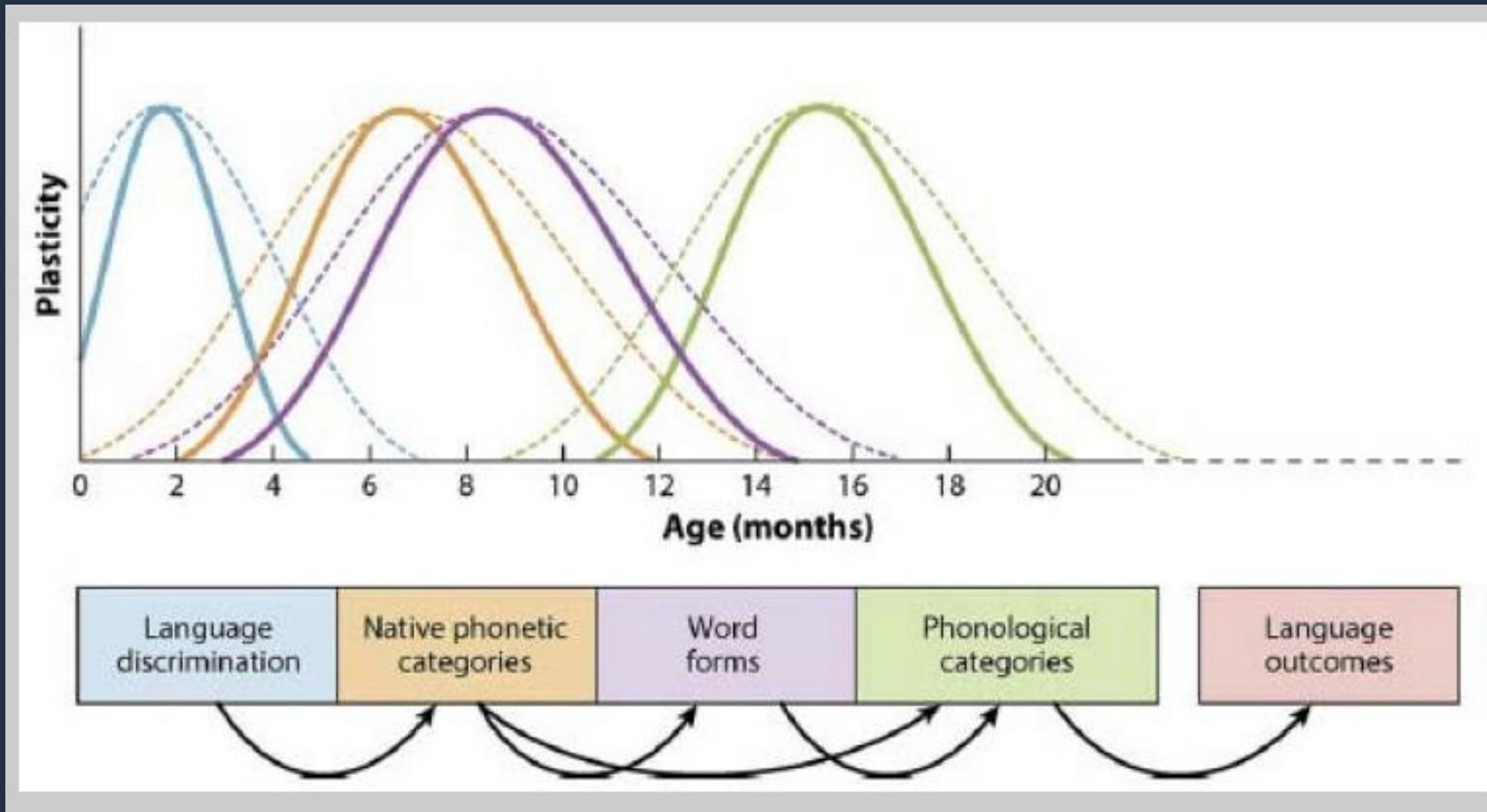


Graph developed by Council for Early Child Development (ref: Nash, 1997; Early Years Study, 1999; Shonkoff, 2000.)

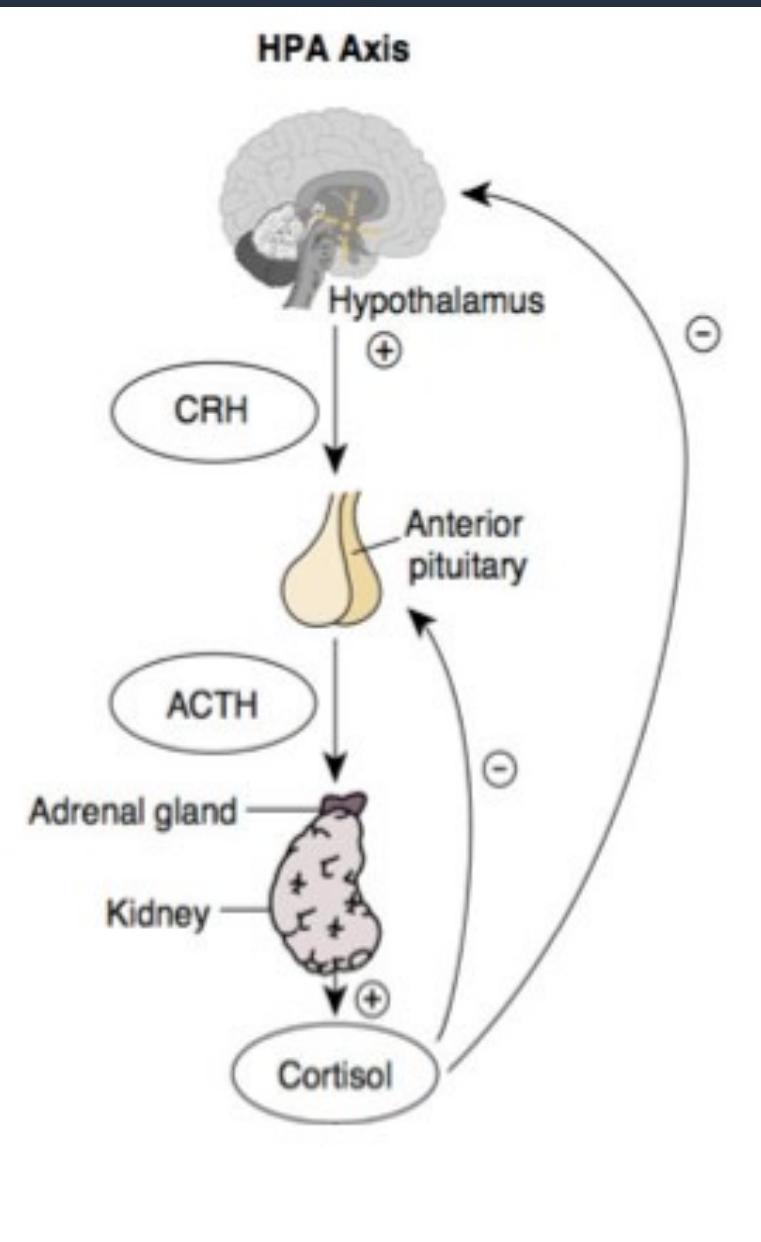
**Figure 1**

### Sensitive periods in early brain development

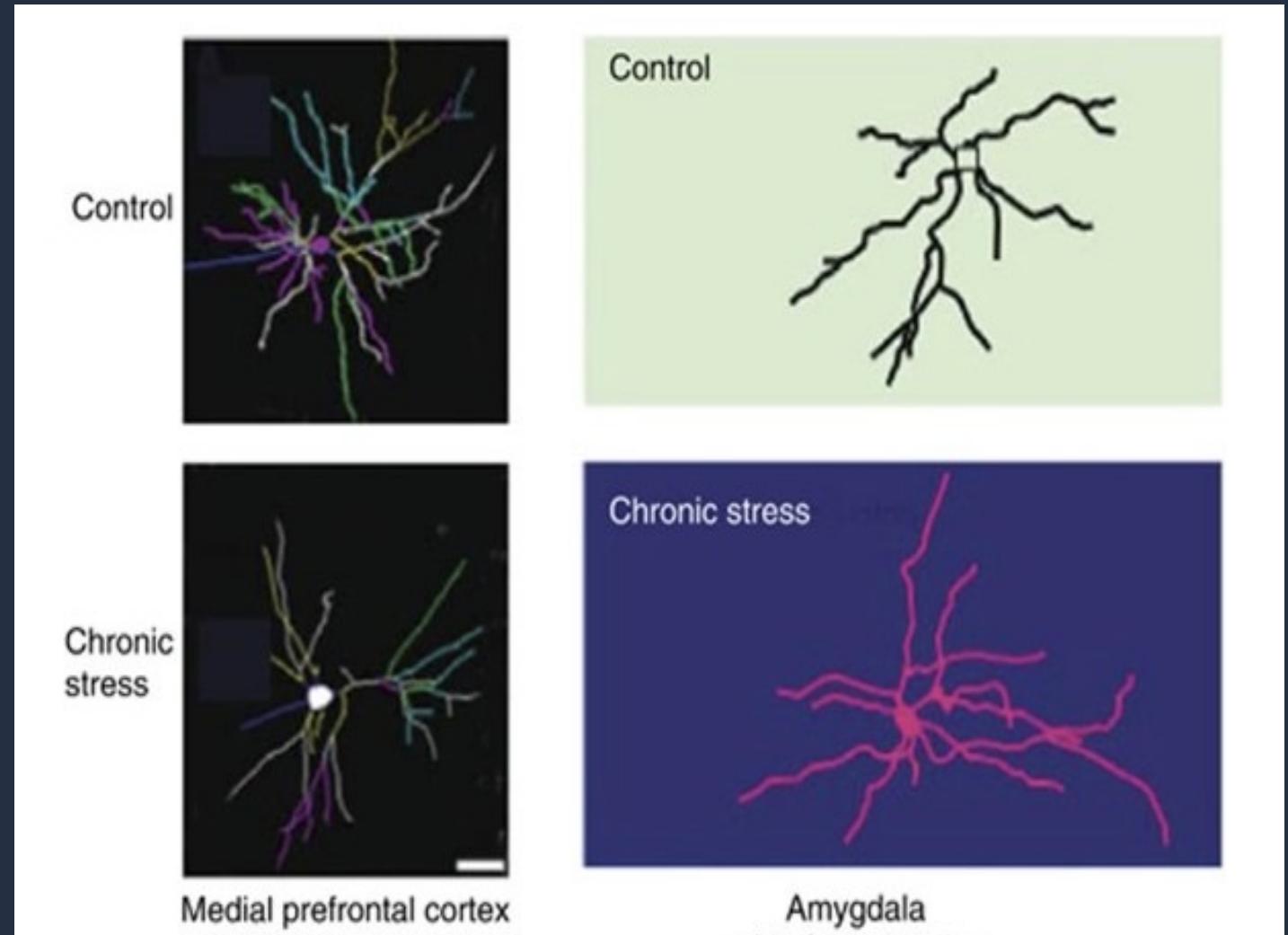
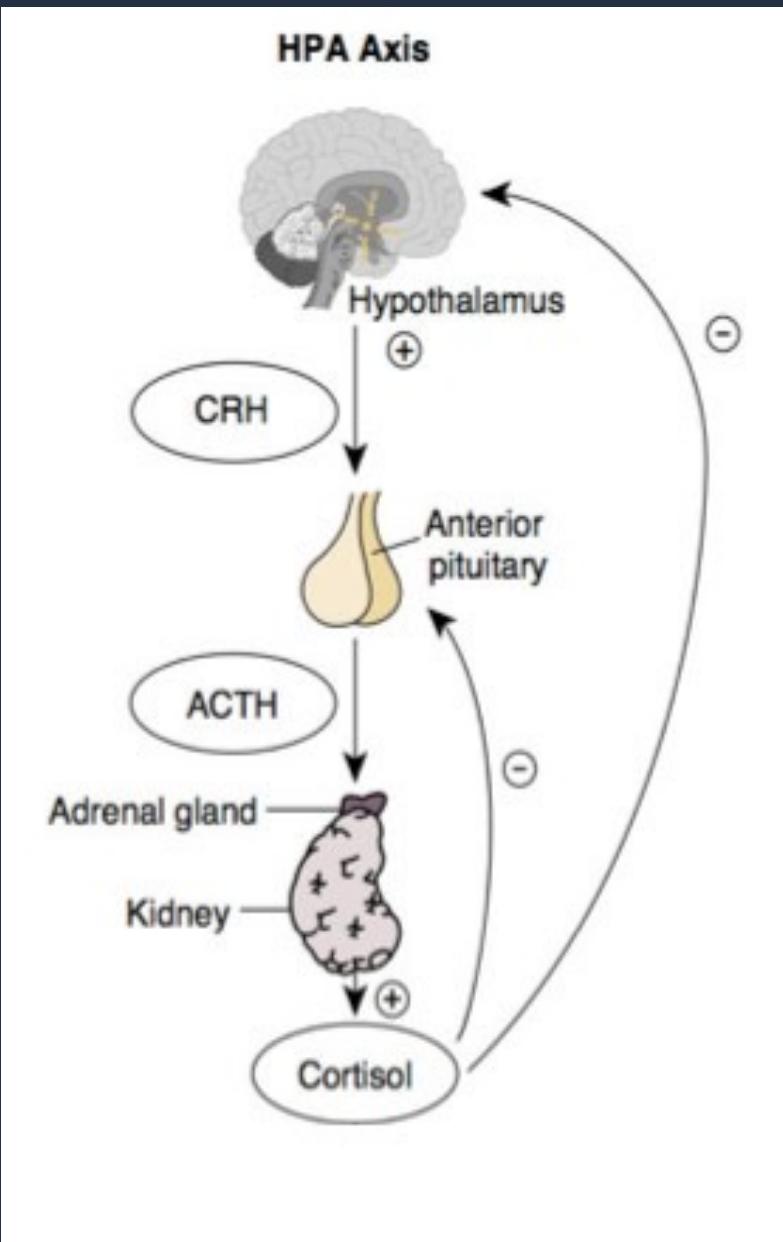
Brain architecture is developed in a bottom-up sequential manner, and is especially sensitive to environments and experiences in the early years (Council for Early Child Development, 2010).  
Used with permission.



(Hench, 2015)



(Davidson & McEwen, 2012)



(Davidson & McEwen, 2012)

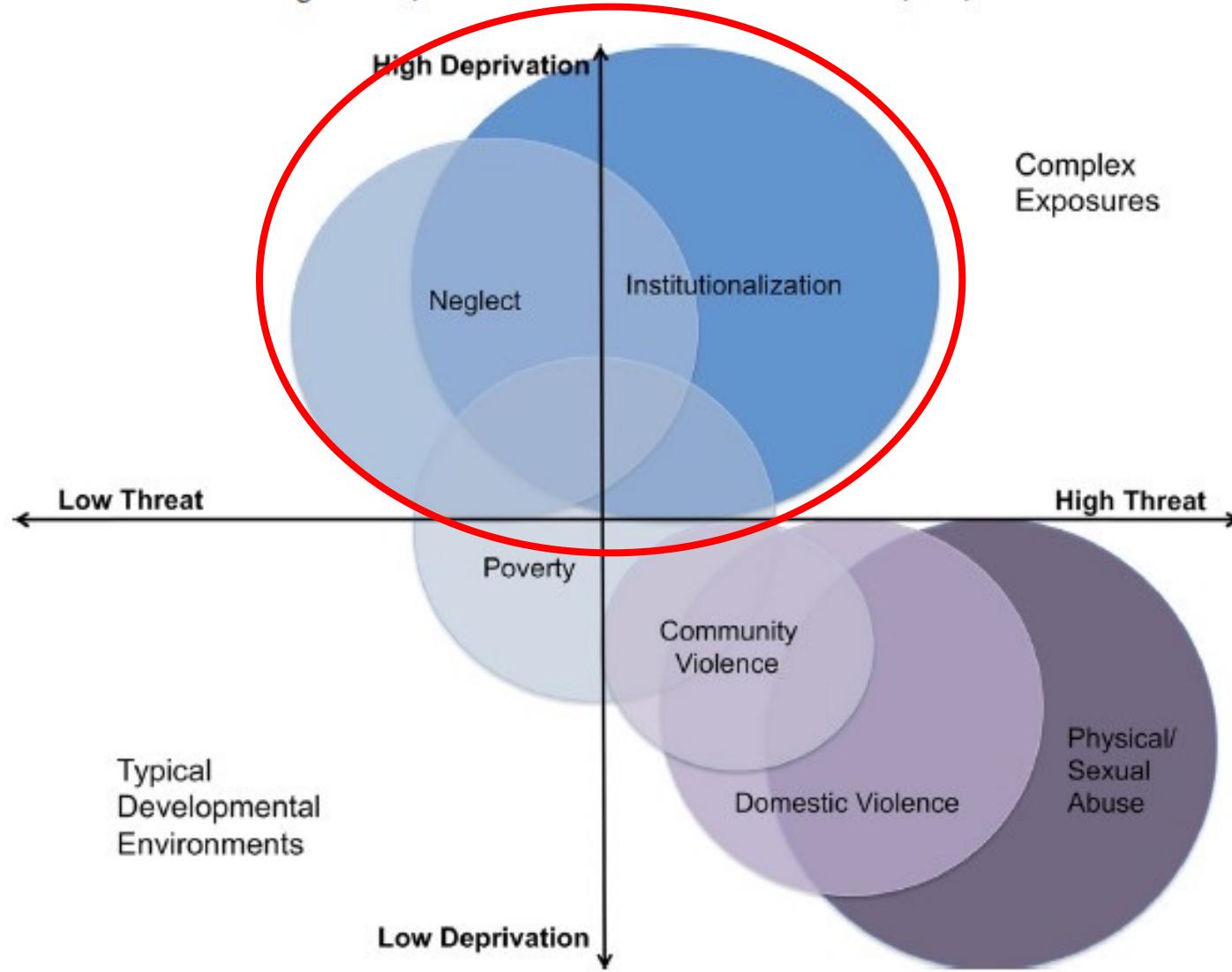
# What is “adversity?”

- **Stress** (The physiological changes in the body in reaction to external factors that are perceived as threatening harm, loss, or misfortune)
  - However, not all forms of adversity will be interpreted and/or encoded as stressful
  - e.g., Genie (an impoverished language environment)
  - not all stressful experiences are adverse
- **Adversity** is: “deviations in or disruptions of the expectable environment” (Nelson, 2007; McLaughlin, Sheridan & Nelson, 2017)

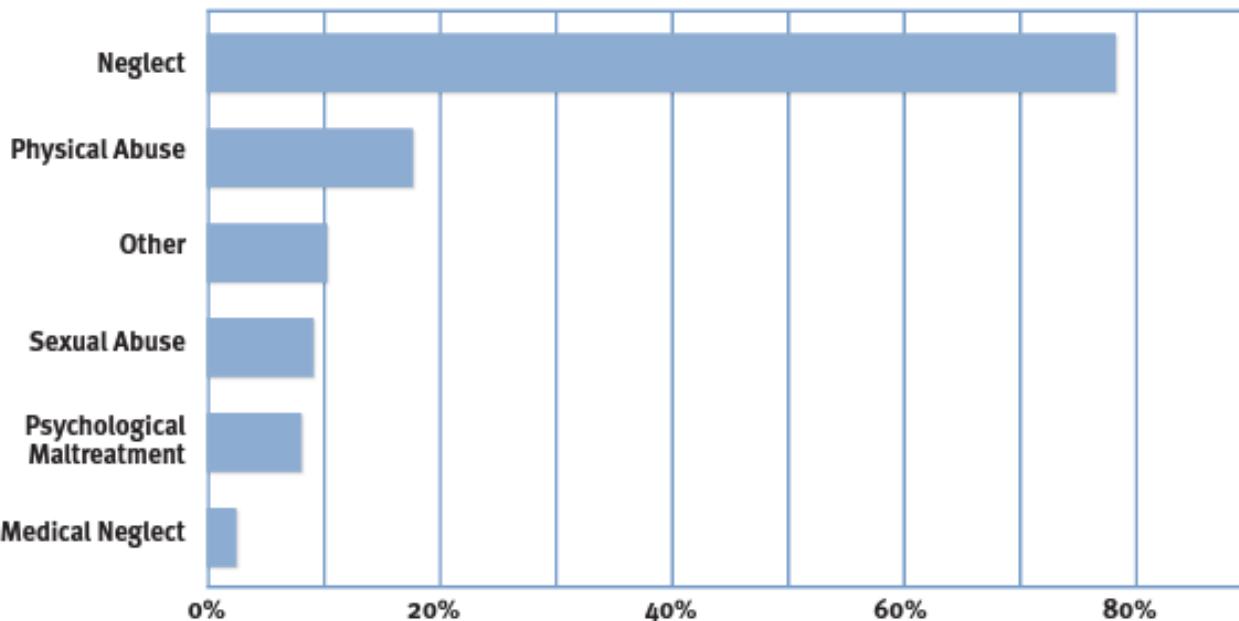
# Early-Life Adversity & Trauma

Deprivation: the absence of expected cognitive or social input

Threat: events that involve actual or threatened death, serious injury, sexual violation, or other harm to one's physical integrity



## Neglect is the Most Prevalent Form of Child Maltreatment



Each state defines the types of child abuse and neglect in its own statute and policy, guided by federal standards, and establishes the level of evidence needed to substantiate a report of maltreatment. The data above, from the National Child Abuse and Neglect Data System (NCANDS), reflects the total number of victims (defined as a child for whom the state determined at least one report of maltreatment was found to be substantiated or indicated) as reported by all 50 states, the District of Columbia, and Puerto Rico, between Oct. 1, 2009, and Sept. 30, 2010. "Other" includes abandonment, threats of harm, and drug addiction.

Source: U.S. Department of Health and Human Services (2010b)<sup>23</sup>



# Adversity/Trauma: Deprivation

the absence of expected cognitive or social (affective) input

# “Secondary Altriciality”



Human neonates are born with the least-developed brains of any primate

Portman, 1969; Gould, 1977

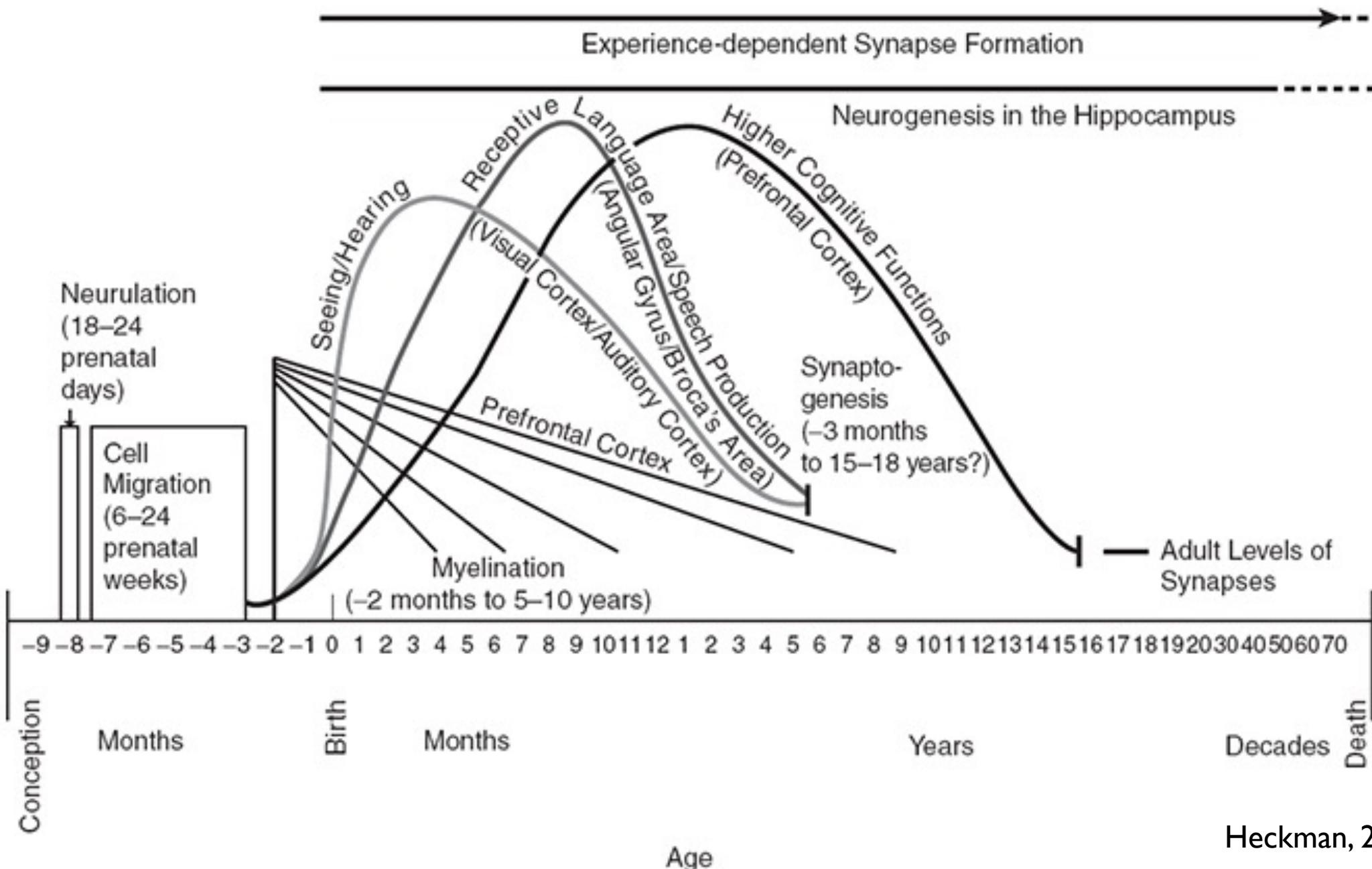
What do human infants require  
in order to survive/thrive?

Food/Water

Shelter/Protection

*Anything else?*

# Human Brain Development



# The Brain Needs Stimulation to Develop



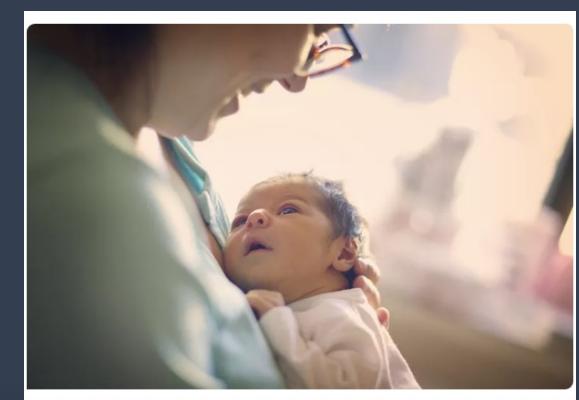
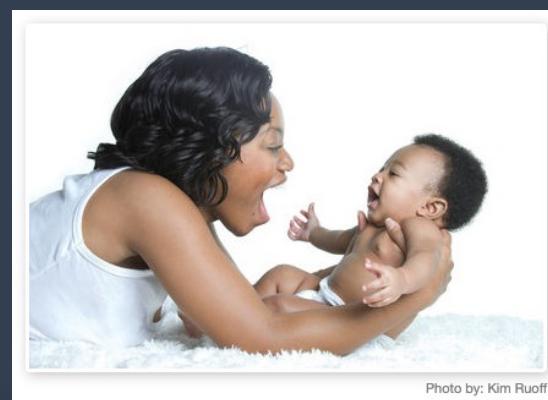


Photo by: Kim Ruoff



# Infants *require* nurture/warmth/love in order to thrive

“Hospitilism”  
Rene Spitz, 1944



Harry Harlow's  
Rhesus Monkey Experiments

“surrogate mother”



total social deprivation



When initially removed from total social isolation...they usually go into a state of depression, characterized by ...autistic self-clutching and rocking. One of the six monkeys isolated for 3 months refused to eat after release and died 5 days later. The autopsy report attributed death to “emotional anorexia.” ...The effects of 6 months of total social isolation were so devastating and debilitating ... but we assumed initially that 12 months of isolation would not produce any additional decrement. This assumption proved to be false; 12 months of isolation almost obliterated the animals socially ...

# Psychosocial Deprivation:

lack of adequate opportunity for  
social and intellectual stimulation  
(aka. nurture)

# Psychosocial deprivation experiments in humans?



The Romanian Orphans

# Social and Behavioral Outcomes of Psychosocial Deprivation

- Disturbances in social relatedness and attachment
- Increased risk for externalizing disorders
  - Attention Deficit Hyperactivity Disorder (ADHD), Oppositional Defiance Disorder (DD), Conduct Disorder (CD)
- Increased risk for internalizing disorders
  - eg. anxiety, depression
- Severe IQ deficits
- Syndrome mimicking autism
- Poor language skills
- Stunted physical growth ("psychosocial dwarfism")



# Adaptation to Promote Survival

For example:

- Indiscriminate friendliness (Chisholm, 1998; Zeanah, Smyke, & Dumitrescu, 2002)
- Decreased response to sensory stimuli (Wilbarger, Gunnar, Schneider, & Pollak, 2010)
- Increased reactivity and sensitivity to emotional stimuli (Fries & Pollak, 2004; Tottenham et al., 2010)



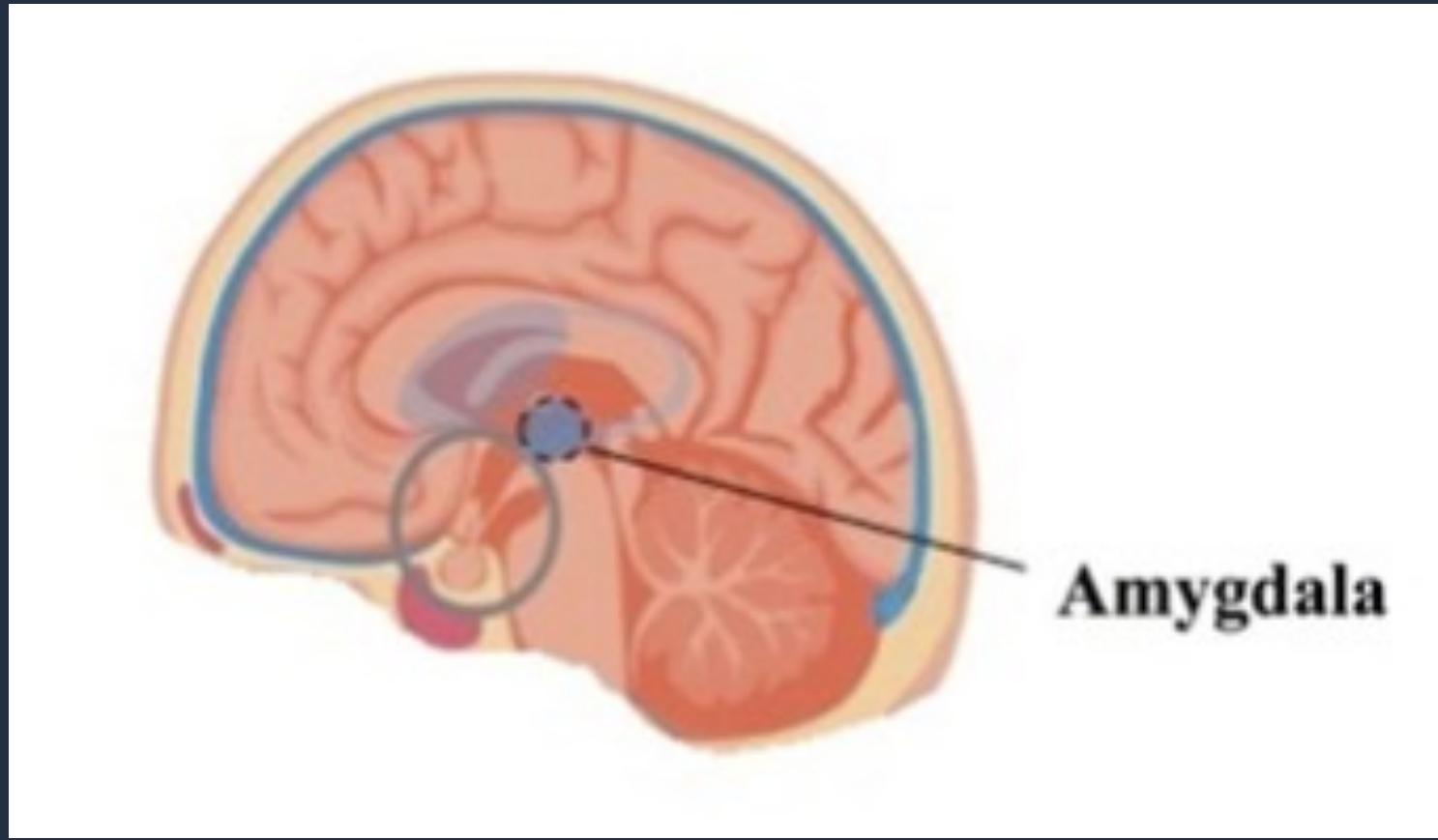
# Psychosocial Deprivation

Is this stress?

(The physiological changes in the body in reaction to external factors that are *perceived* as threatening harm, loss, or misfortune)

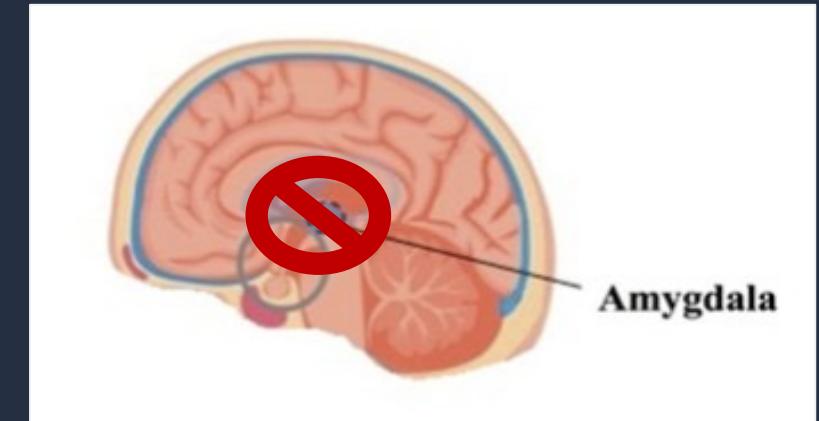


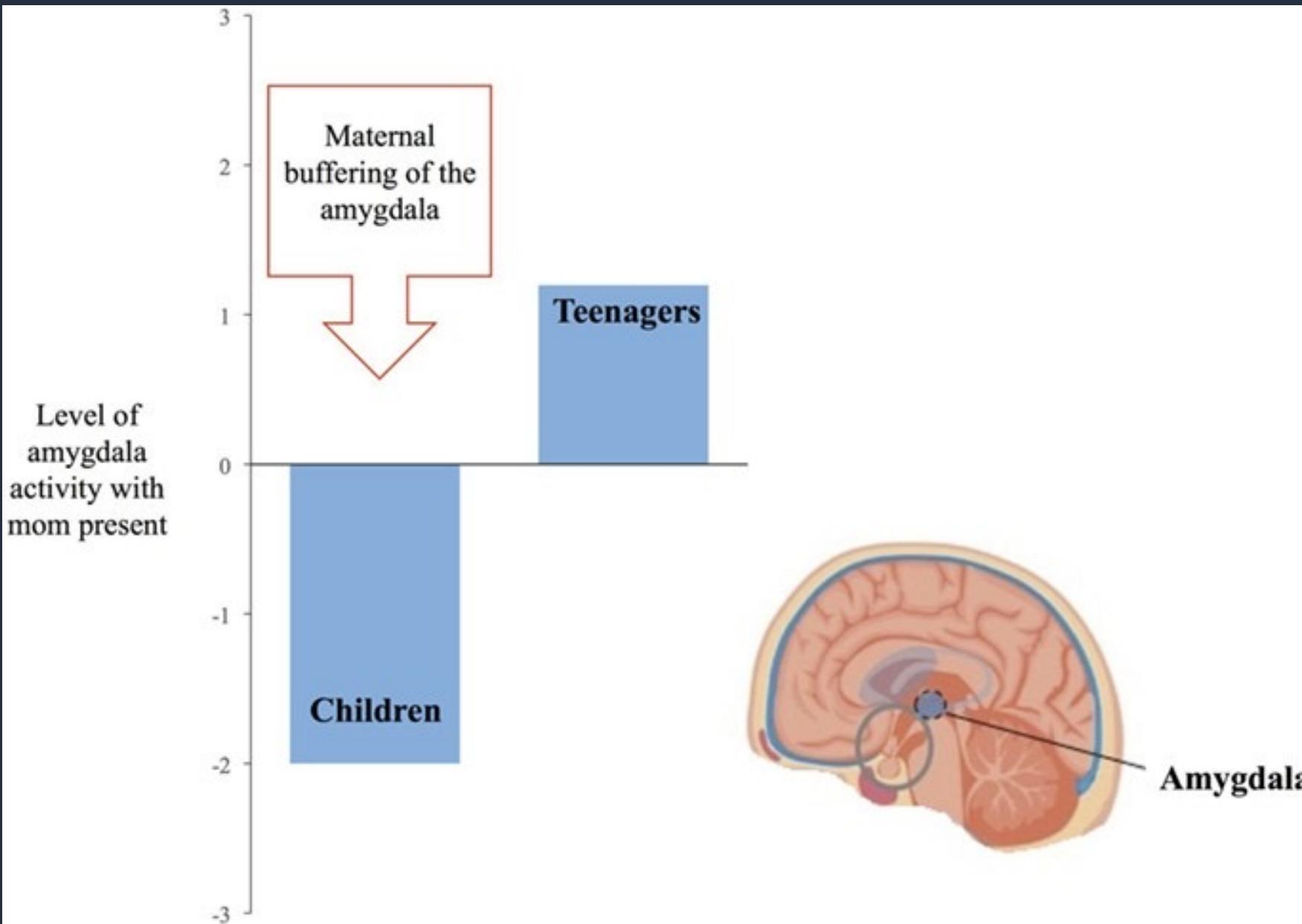
Increased reactivity and sensitivity to emotional stimuli (Fries & Pollak, 2004; Tottenham et al., 2010)



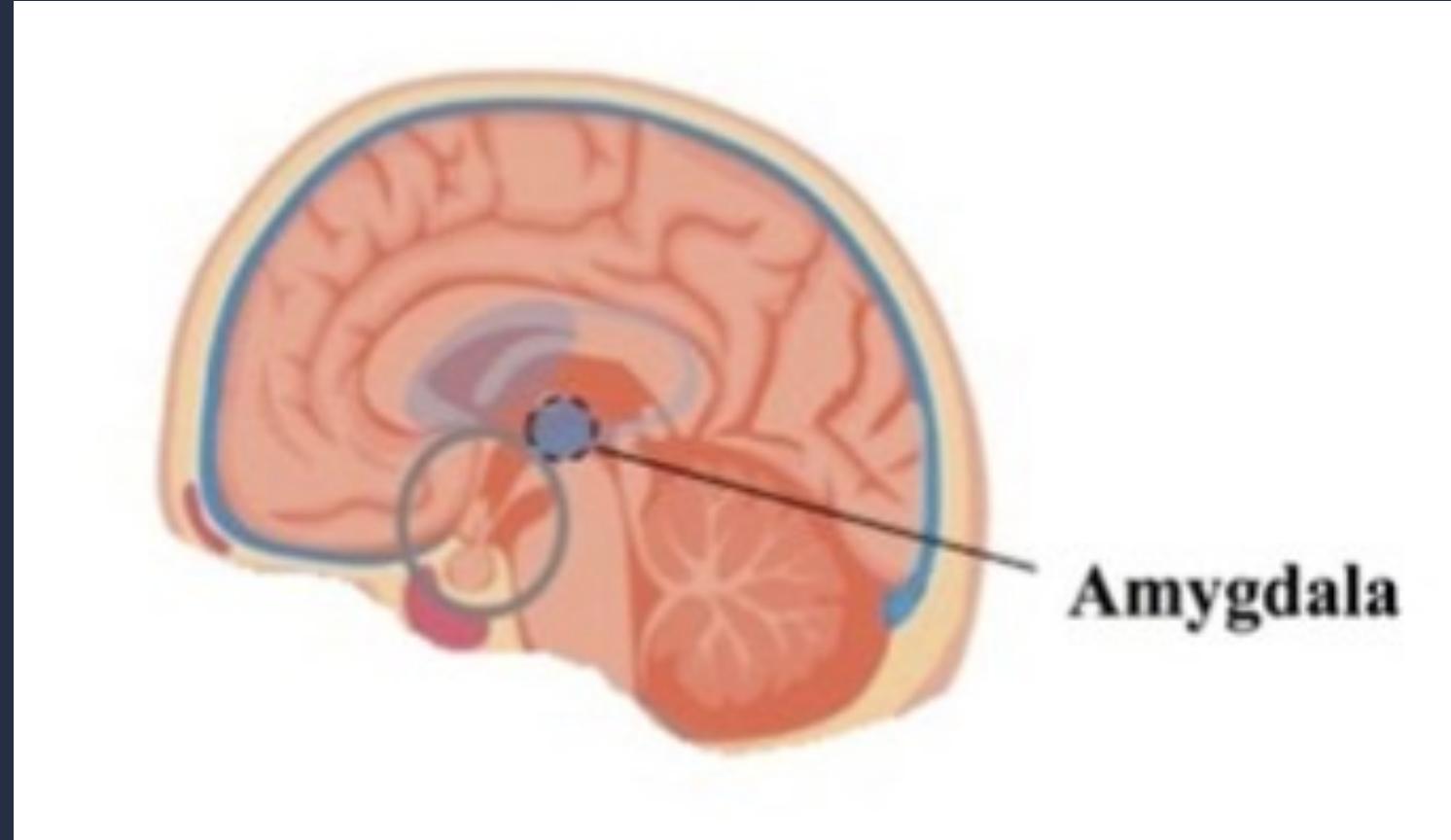
Amygdala detects danger in the environment

From a developmental perspective, how would we expect the amygdala to typically function in an infant/young child?





# What if there is no caregiver?



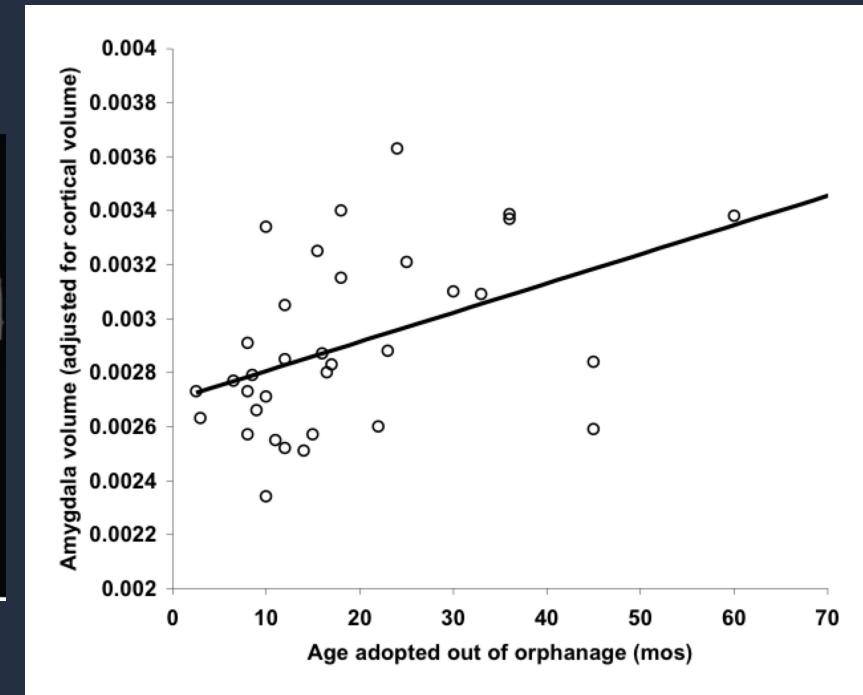
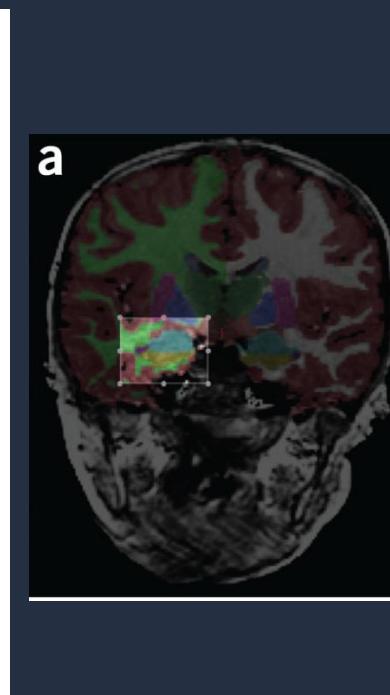
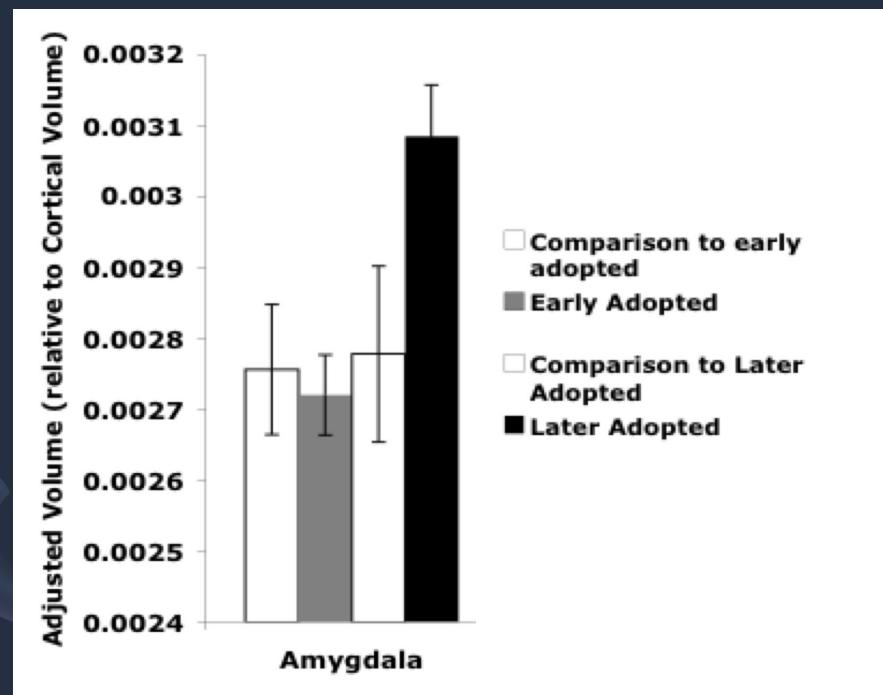
Amygdala detects danger in the environment

# Previously Institutionalized Youth



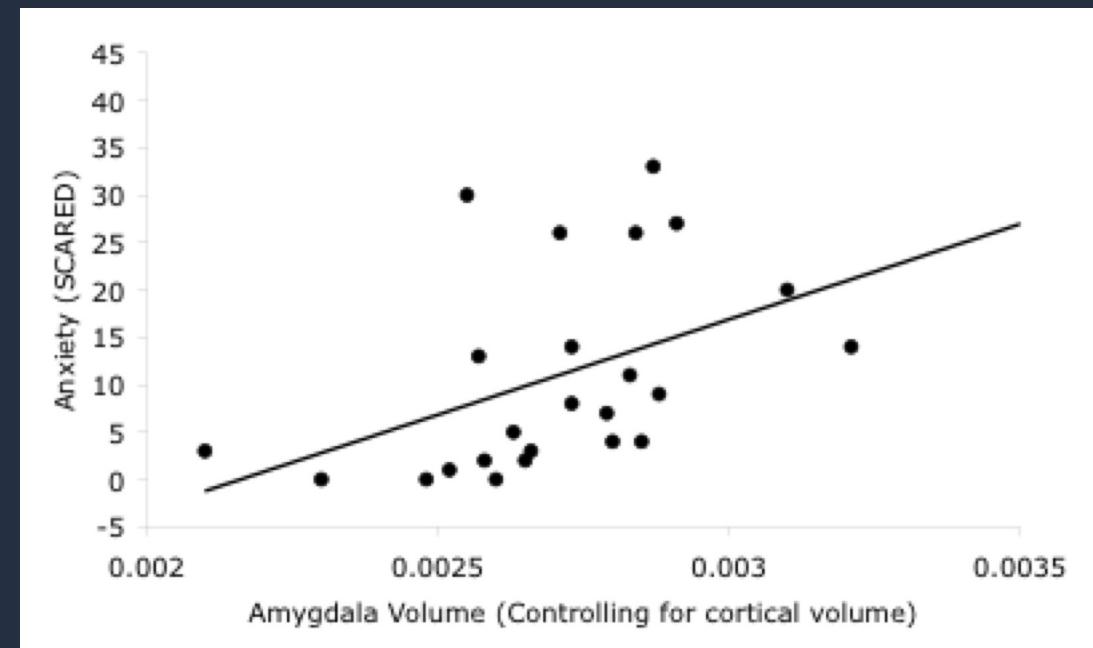
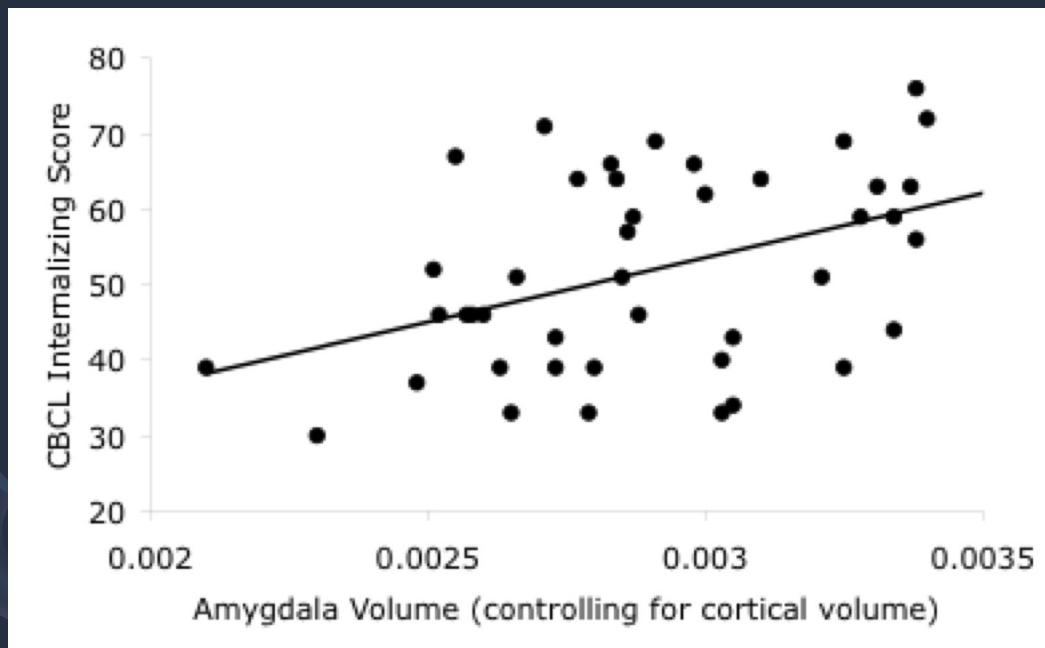
# Increased Amygdala Volume and Reactivity

- Increased amygdala activity to threatening stimuli in Pls (Gee, Gabard-Durnam, et al., 2013; Maheu et al., 2010; Tottenham et al., 2011)

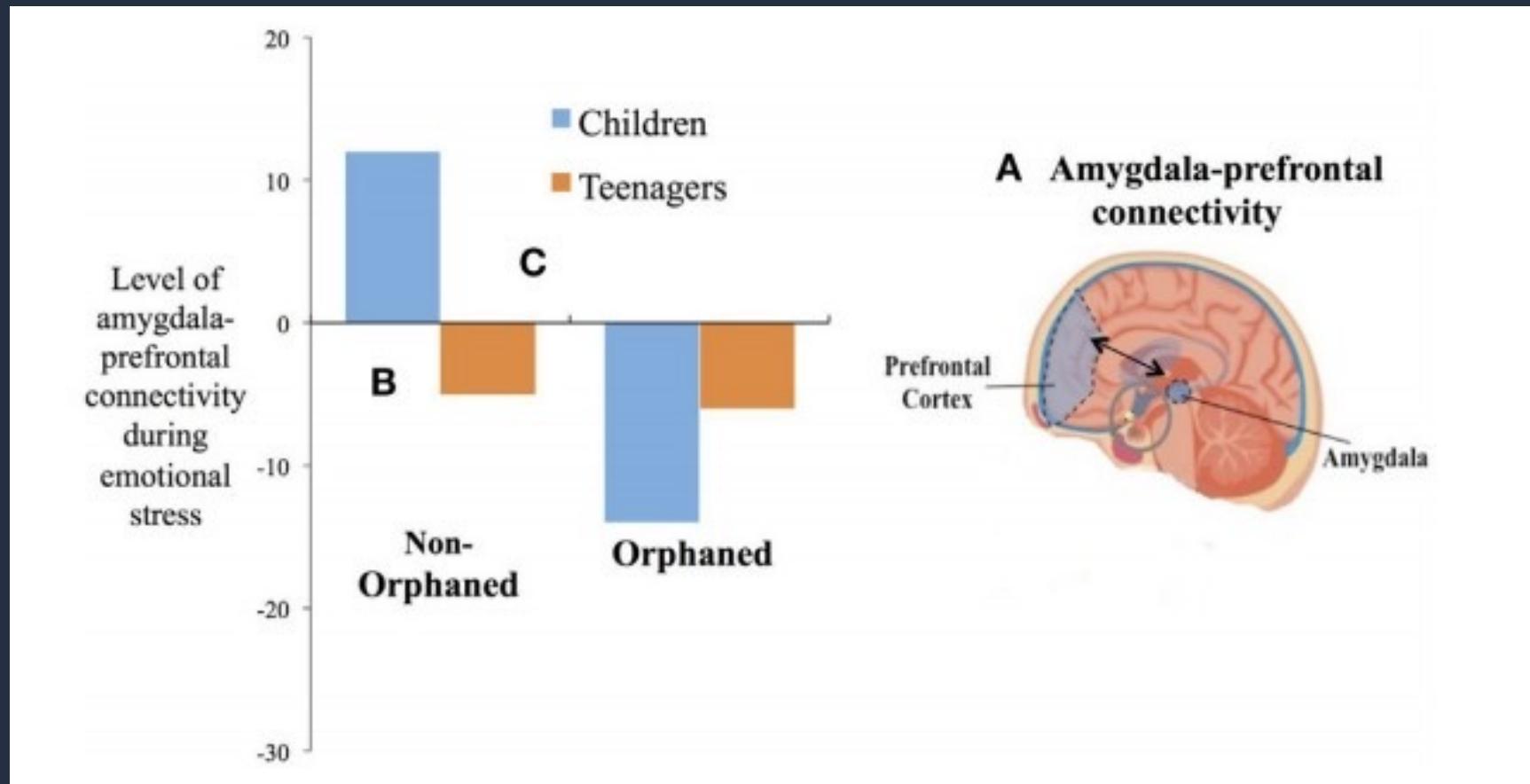


# Increased Anxiety

- Correlation between larger amygdala volume and trait anxiety in PIs



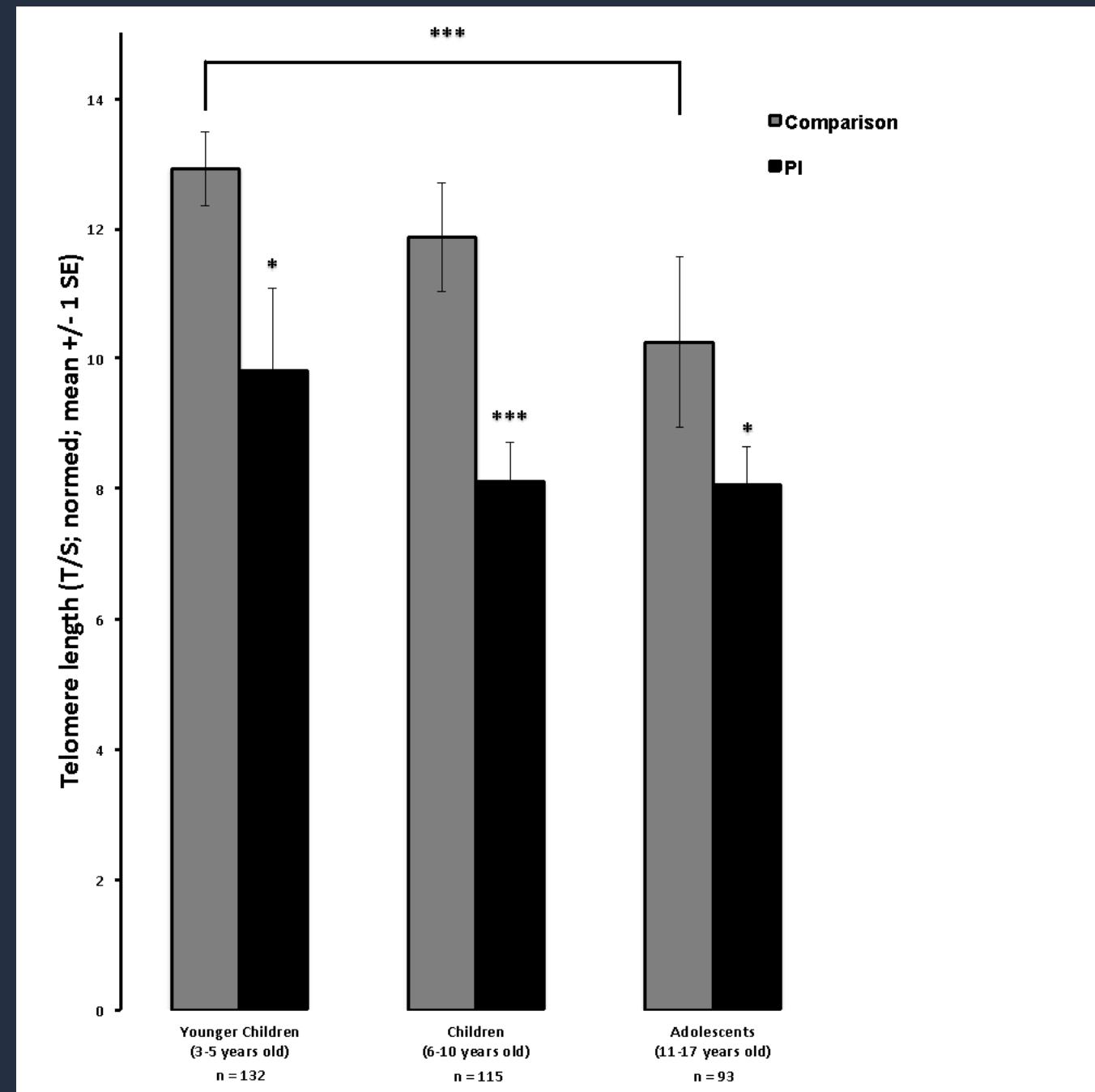
# Early Maturation of PFC-Amygdala Connectivity



Gee et al., 2014

# Epigenetic Changes

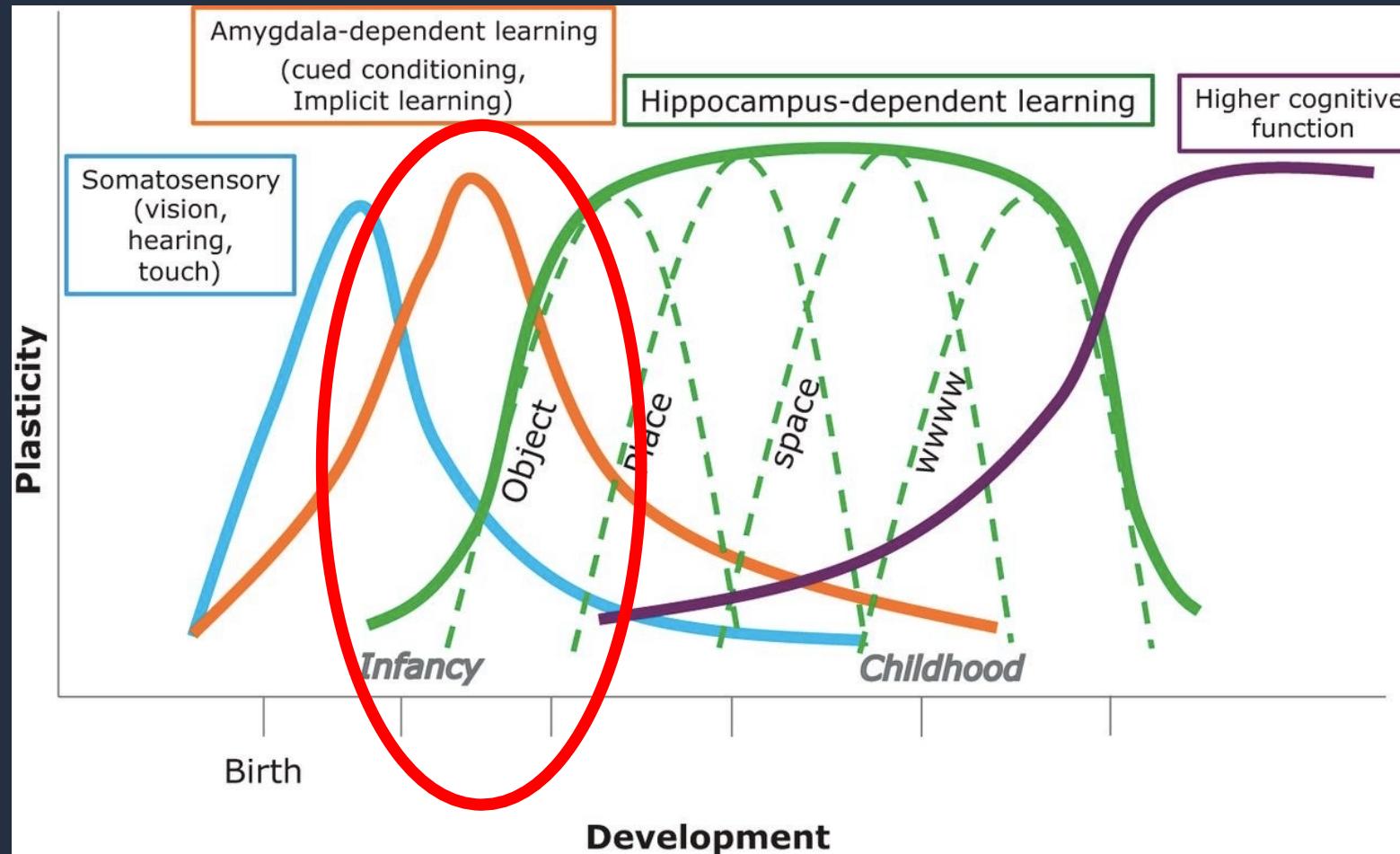
Heleniak et al., *in press*



# Effects of Early Adversity (Caregiver Neglect/Deprivation)

- Behavior (Caldji et al., 1998; Nelson et al., 2002; Rosenblum; 2001)
  - Atypical emotional reactivity
    - Stress reactivity (Gee, Gabard-Durnam, et al., 2013; Maheu et al., 2010; Tottenham et al., 2011)
    - Increased fearful behavior
    - Increased sensitivity to negative information (Dagleish et al., 2001)
    - Increased anxious behavior (Vyas & Chattarji, 2004; Tottenham et al., 2010)
  - Odd social behavior
    - Intimate relationships (O' Connor et al., 2003)
    - Peer friendships (Hodges & Tizard, 1989)
      - Quarrelsome
      - Less often liked
      - Less likely to have a special friend
- These effects persist into adulthood (Plotsky et al., 2017)

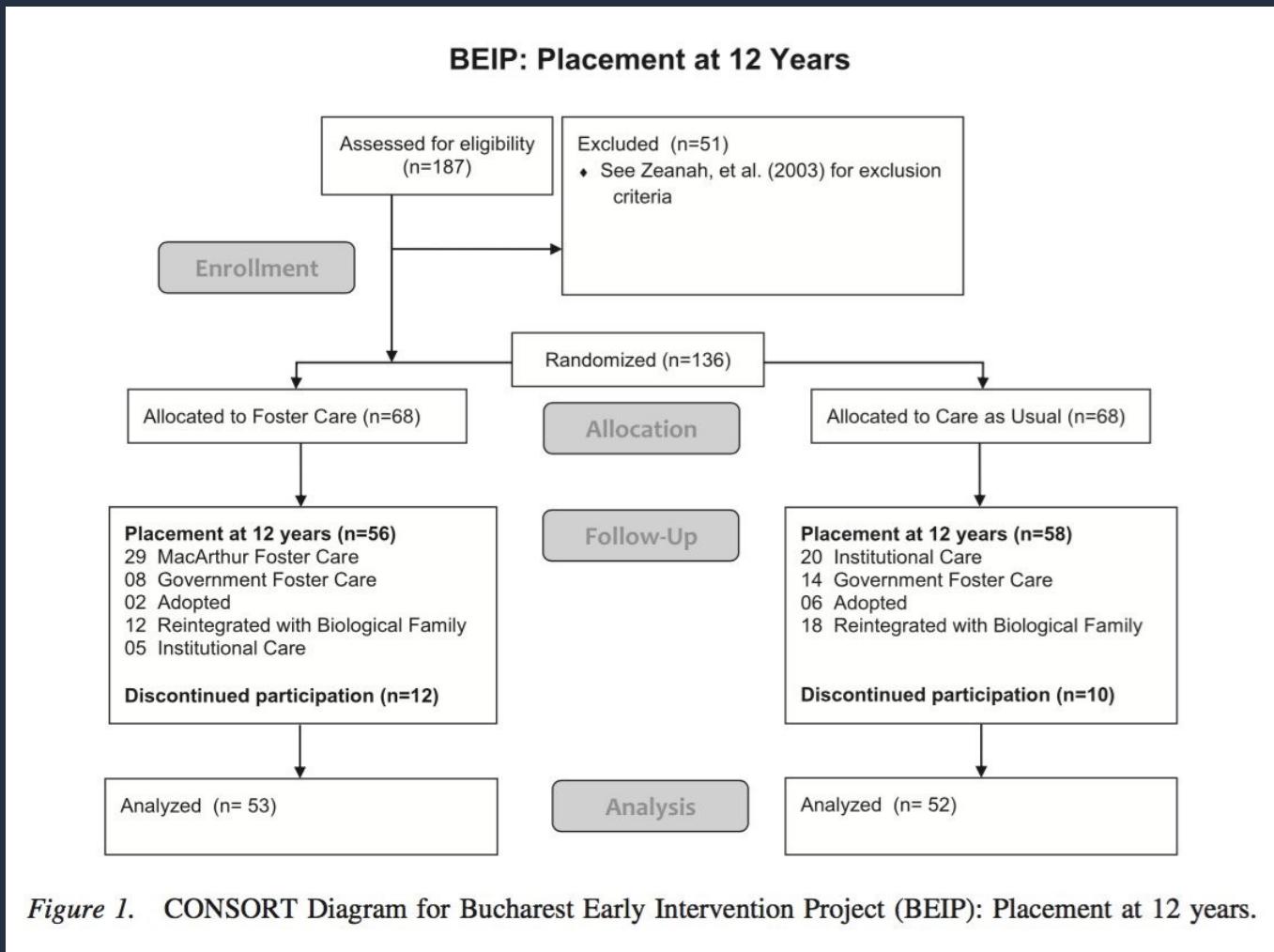
# Enduring Impact of Early Adversity (Caregiver Neglect/Deprivation)



# The Romanian Orphans



# Bucharest Early Intervention Project (BEIP)



# Cognitive Recovery in Socially Deprived Young Children: The Bucharest Early Intervention Project

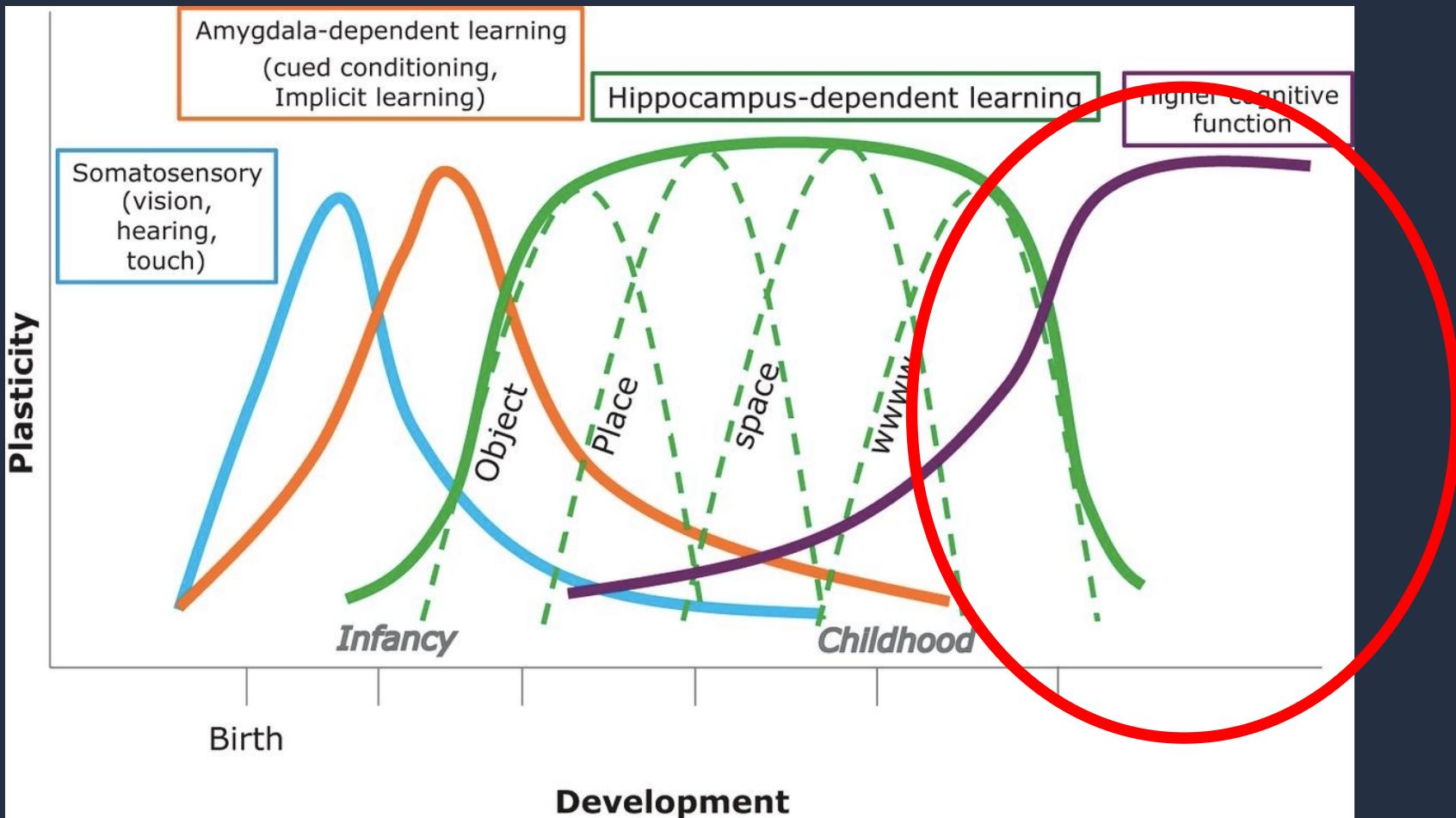
Charles A. Nelson III,<sup>1\*</sup> Charles H. Zeanah,<sup>2</sup> Nathan A. Fox,<sup>3</sup>  
Peter J. Marshall,<sup>4</sup> Anna T. Smyke,<sup>2</sup> Donald Guthrie<sup>5</sup>

In a randomized controlled trial, we compared abandoned children reared in institutions to abandoned children placed in institutions but then moved to foster care. Young children living in institutions were randomly assigned to continued institutional care or to placement in foster care, and their cognitive development was tracked through 54 months of age. The cognitive outcome of children who remained in the institution was markedly below that of never-institutionalized children and children taken out of the institution and placed into foster care. The improved cognitive outcomes we observed at 42 and 54 months were most marked for the youngest children placed in foster care. These results point to the negative sequelae of early institutionalization, suggest a possible sensitive period in cognitive development, and underscore the advantages of family placements for young abandoned children.

Nelson et al., 2007

1. Children randomly assigned to foster care experienced significant gains in cognitive function
2. The younger a child was when placed in foster care, the better the outcome

# Enduring Impact of Early Adversity (Caregiver Neglect/Deprivation)



# What if there is no caregiver?

- Absence of caregiver prematurely engages the amygdala in learning about the environment
- This premature activation results in hypervigilance and altered emotional responding

# Important Note: Neglect exists across a spectrum

Netflix: Old Enough



Childhood independence across the world varies greatly, and much of this variation is due to the beliefs of parents about their child's development.



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## Social Policy Report

**The Unintended Consequences of “Lack of Supervision”  
Child Neglect Laws: How Developmental Science Can Inform  
Policies about Childhood Independence and Child Protection**

**Rachel M. Flynn** , Department of Child & Adolescent Development, San Francisco State University, San Francisco, California, USA

**Nicholas J. Shuman** , Department of Psychology, University of Houston—Clear Lake, Houston, Texas, USA

**Diane L. Redleaf** , Principal, Family Defense Consulting, LLC, Oak Park, Illinois, USA

# This Week's Assignment

- 1) Listen to NPR's *This American Life* podcast episode, "Unconditional Love" (Prologue and Act 1 are required, Act 2 is optional and not part of this assignment)
- 2) Respond to the following prompt: Describe your thoughts and perceptions about the story of the Solomon family and the relationship between Heidi and Daniel. Connect your ideas to this week's course material. Please limit your response to 250-400 words.



Heidi & Daniel

- Podcast link:  
<https://www.thisamericanlife.org/317/unconditional-love>

Heads up!  
Syllabus change (neglect reading)

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NATIONAL SCIENTIFIC COUNCIL ON THE DEVELOPING CHILD

**The Science of Neglect:  
The Persistent Absence of Responsive Care  
Disrupts the Developing Brain**

WORKING PAPER 12



# Questions?