

INRICH 9<sup>th</sup> Annual Workshop  
Keynote speaker: Dr. Gene Brody  
*Psychosocial pathways of inequalities in  
child health*

Discussant

Pilyoung Kim, Ph.D.

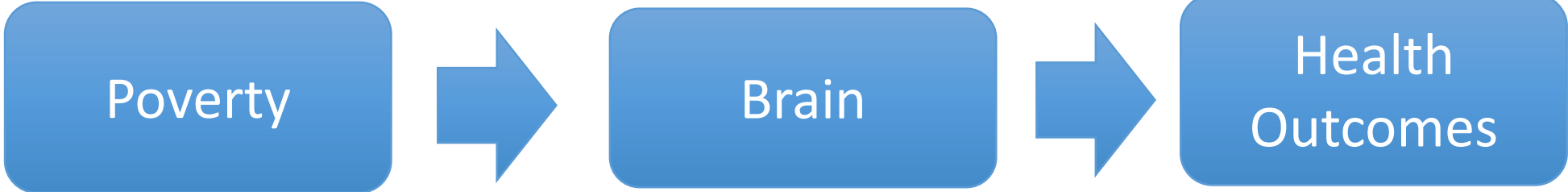
Assistant Professor

Department of Psychology

University of Denver

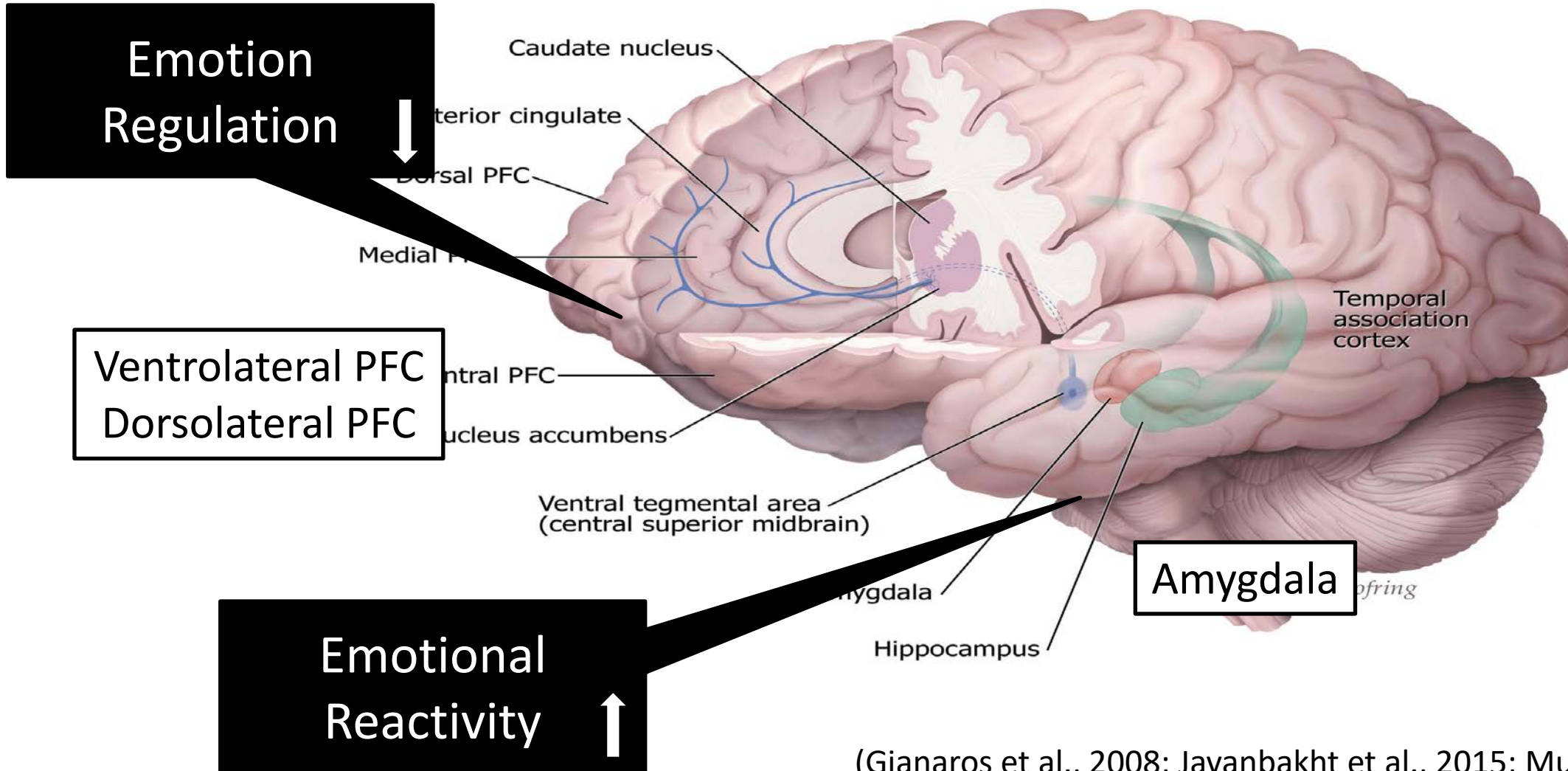
# Skin-deep Resilience (Dr. Brody)

- Resilience has a double-edged sword for African American Youths
  - Academic success and psychological adjustment
  - Greater vulnerability to physical health problems
- Considering the context of socioeconomic disadvantages in the development of multi-level systems

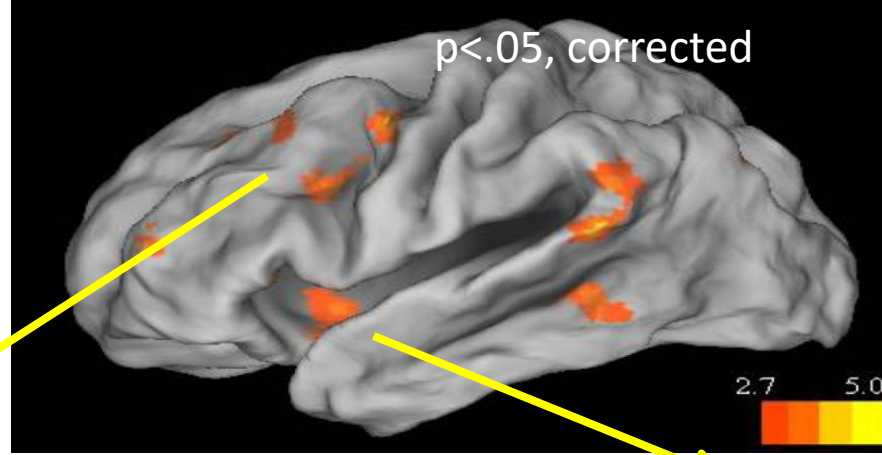




# Poverty and Brain

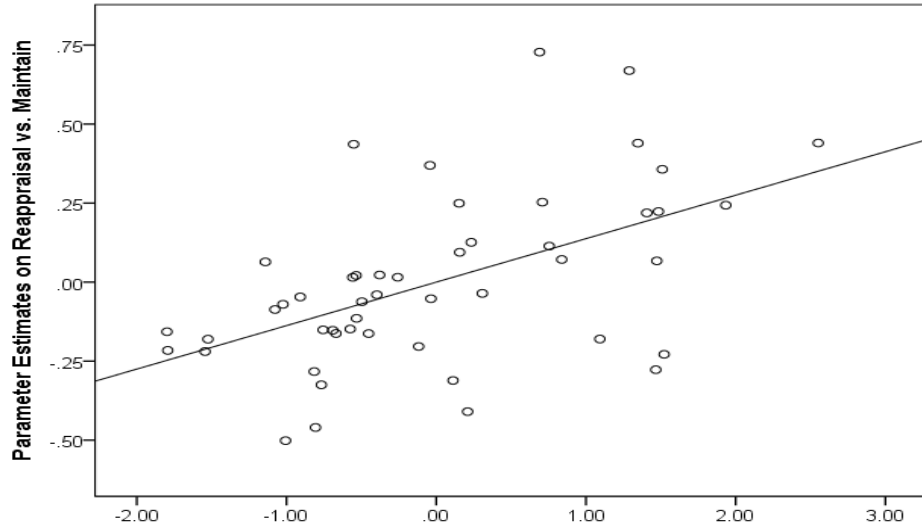
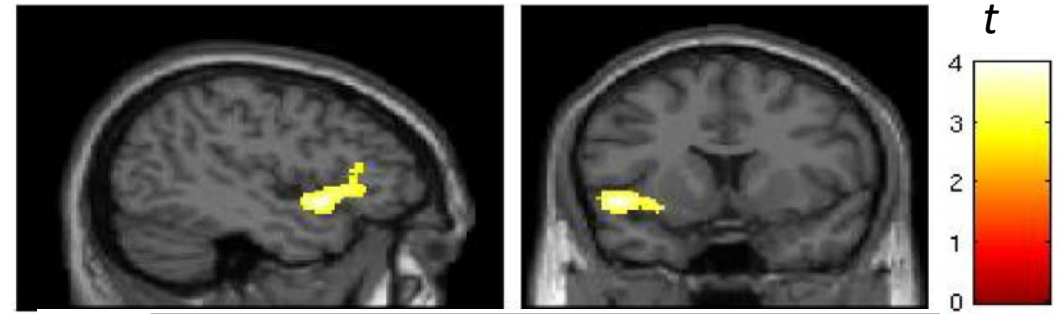
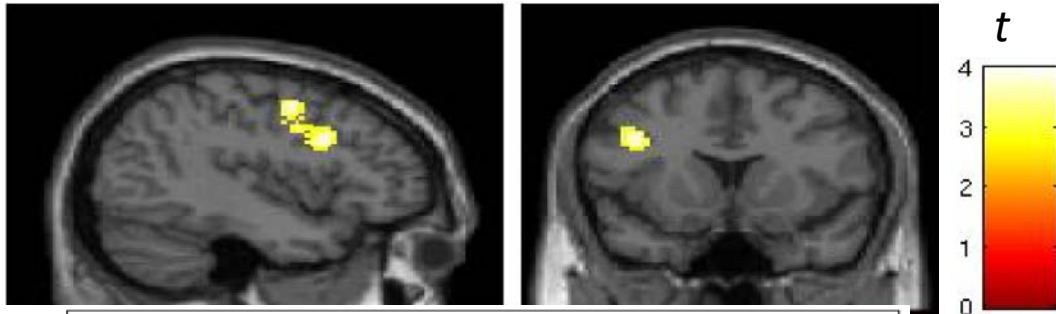


**Reappraise > Maintain**

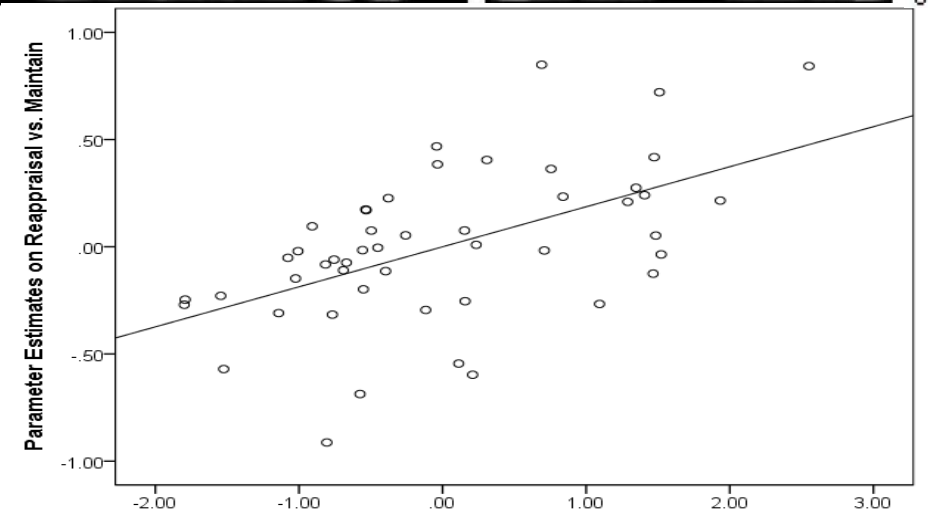


**Dorsolateral PFC**

**Ventrolateral  
PFC/Insula/Temporopolar  
Area**

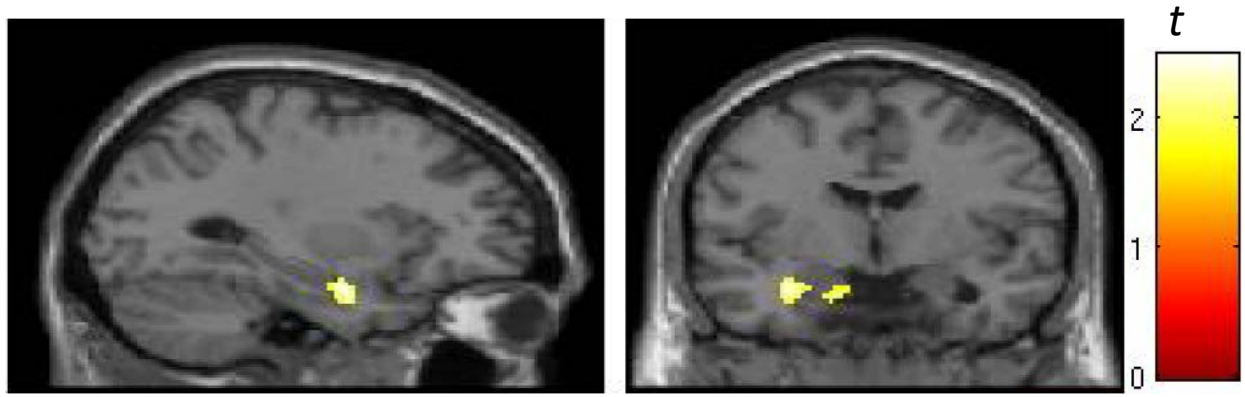


**Family Income at Age 9**



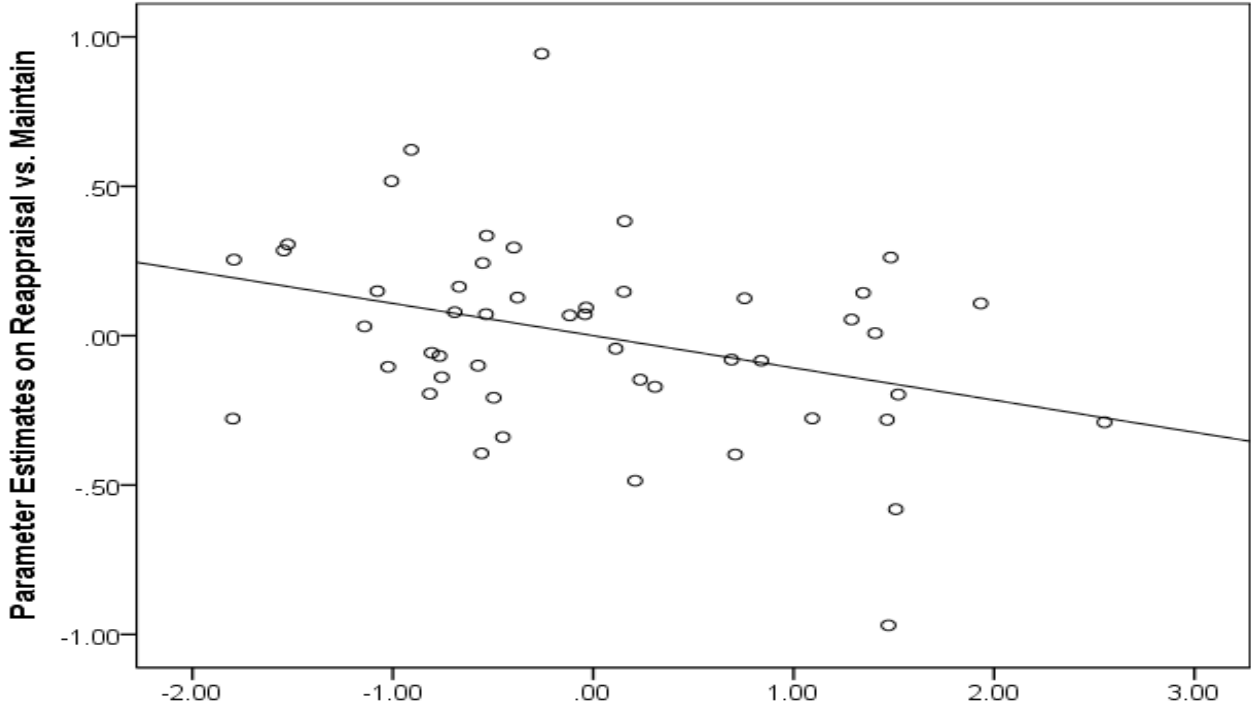
**Family Income at Age 9**

# Amygdala



Reappraise > Maintain

$p < .05$ , uncorrected



Family Income at Age 9

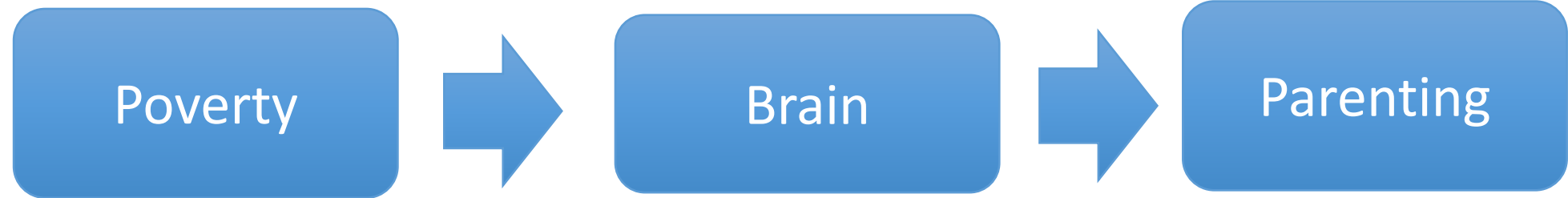
# Adaptive or Maladaptive Plasticity?

- **Allostatic Load Model** (McEwen, 2012)
  - Chronic stress causes disruptions of brain structure and function that are the precursors of later impairments in learning and behavior and chronic physical and mental illnesses
- **Active Calibration Model** (Ellis & Del Giudice, 2014)
  - processes to optimize the individuals adaptation to and resulting fitness for a particular environment, whether threatening or nurturing



# Parenting Effects (Dr. Brody)

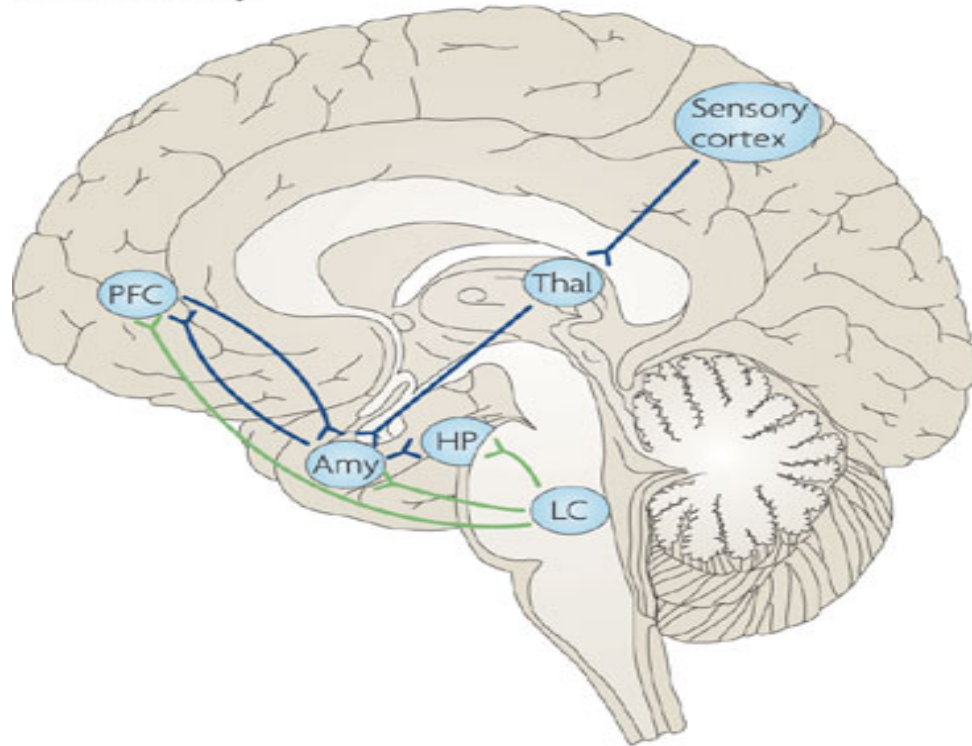
- Protective roles of supportive parenting throughout the childhood
  - Natural variations at home
  - Changes associated with the intervention
- Considering the contexts of socioeconomic disadvantage for understanding multi-level mechanisms of parenting



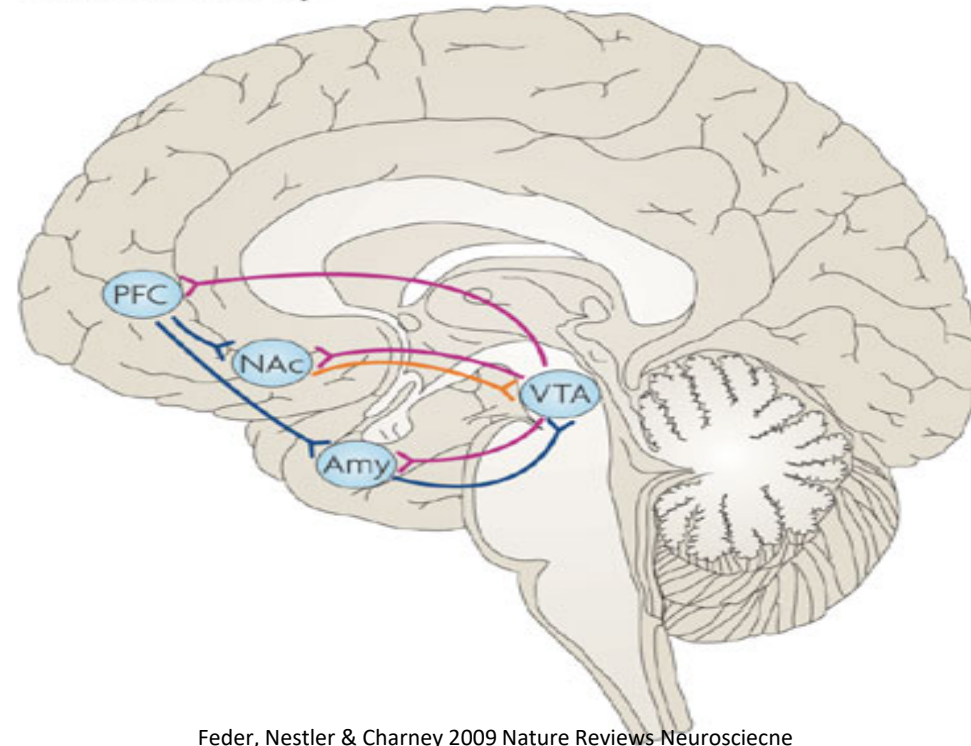


Amygdala is involved in salience detection and motivation.

**a** Fear circuitry



**b** Reward circuitry



Feder, Nestler & Charney 2009 Nature Reviews Neuroscience

# Elevated Amygdalar Sensitivity to Infant Emotion during the postpartum period

- In rodents, lesions in the amygdala impair maternal sensitivity (Numan et al., 2010), and mother-pup interactions increase c-fos changes in the amygdala (Fleming & Korsmit, 1996).
- In human mothers, the amygdala is activated by infant faces, particularly positive affect faces (Barrett & Fleming, 2011; Kim et al., 2016b; Seifritz et al., 2003).
- Higher levels of parental distress are associated with dampened amygdala responses to positive infant faces among new mothers (Barrett et al., 2012).

# Socioeconomic Disadvantage and Mothering

- Low-income mothers report higher levels of psychological distress during the postpartum period (Goyal, Gay, & Lee, 2010).
  - Greater risks for negative mother-infant relationships
  - A potential mechanism for the intergenerational transmission of poverty (Kim&Bianco,2014;Tribble&Kim, in press)

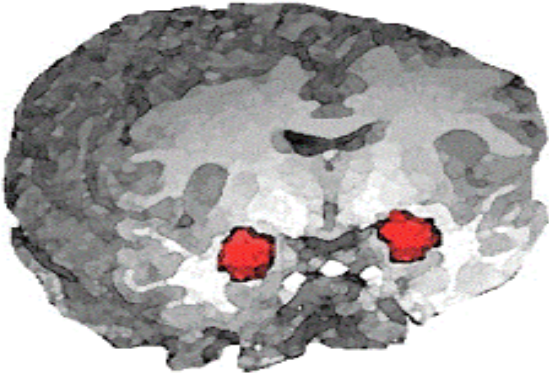
Poverty



Brain



Parenting

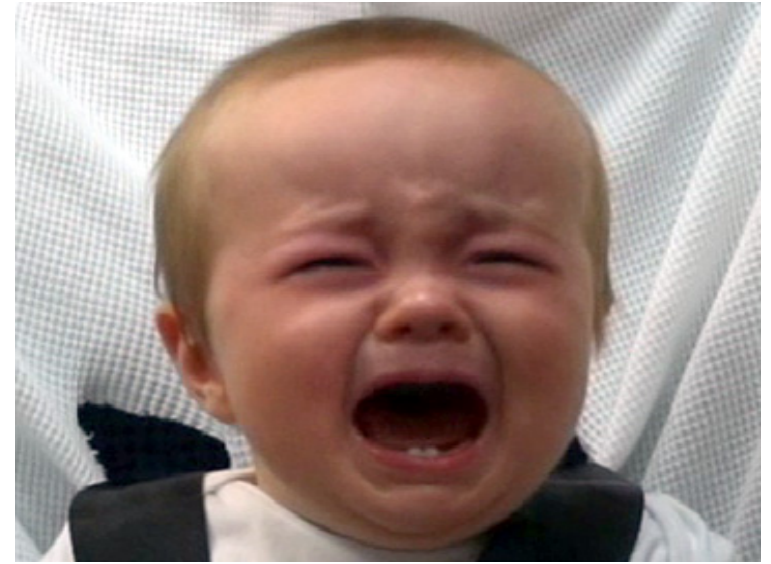




Positive



Neutral

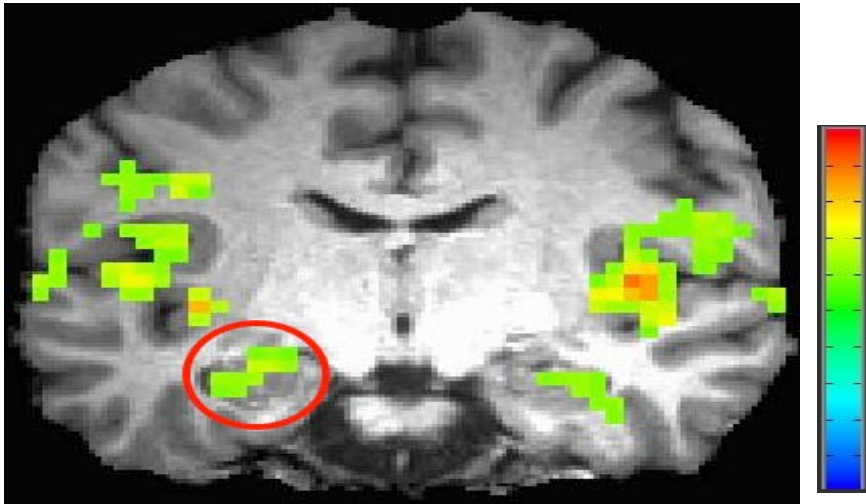


Negative

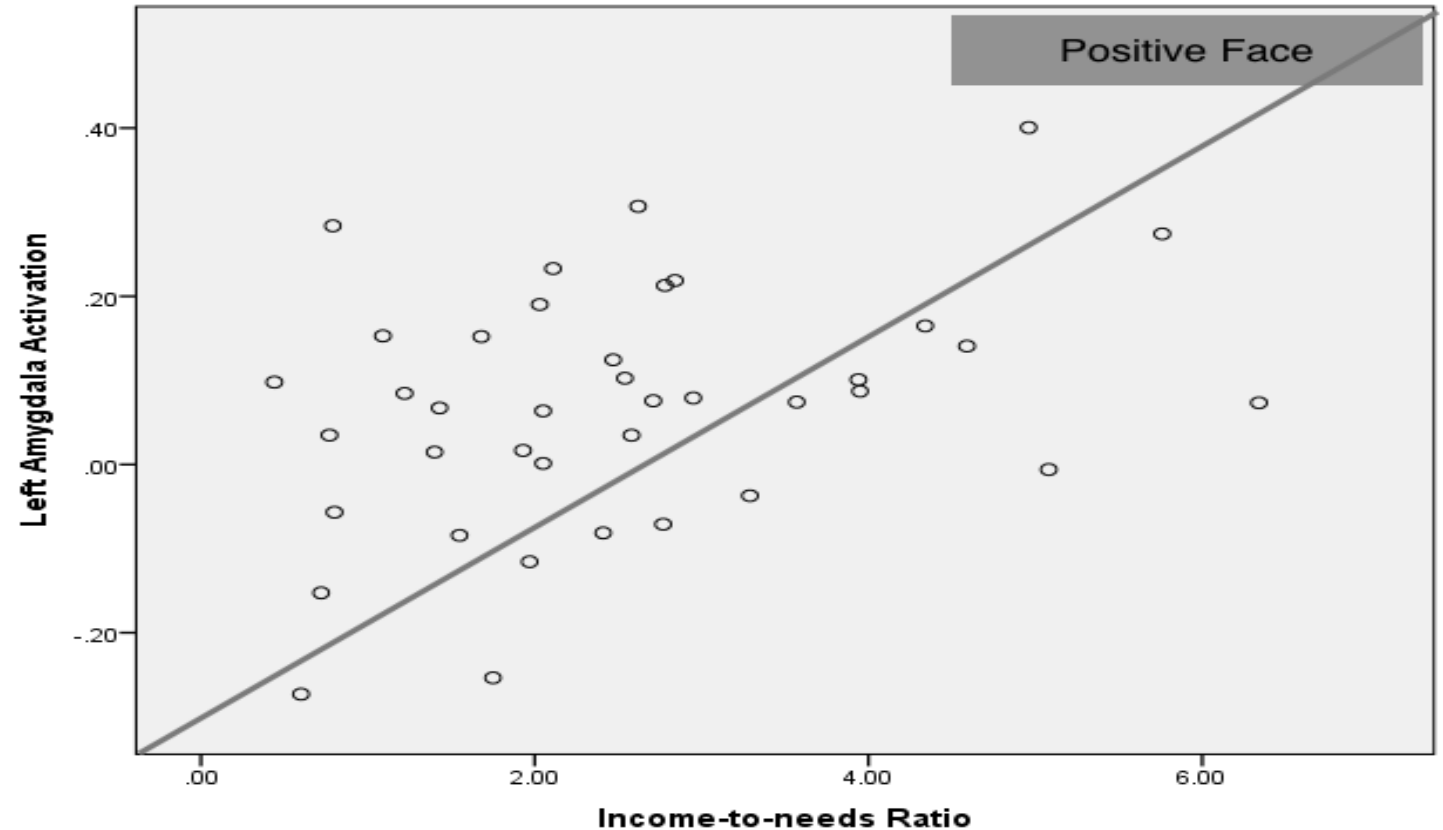


# Lower income is associated with dampened amygdala responses to positive infant emotion.

- 2-way interactions [Emotion X Income]

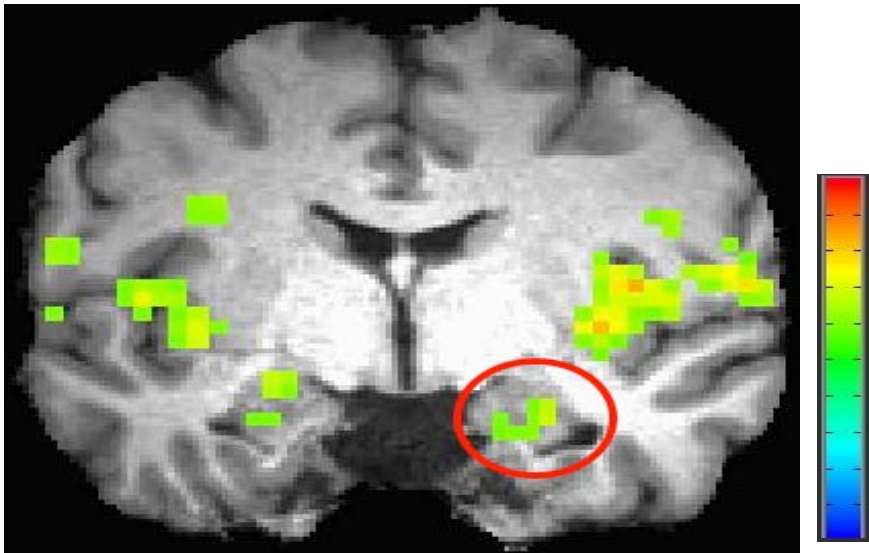


$x, y, z = -25, -10, -13; k=55, p<.05, SVC$

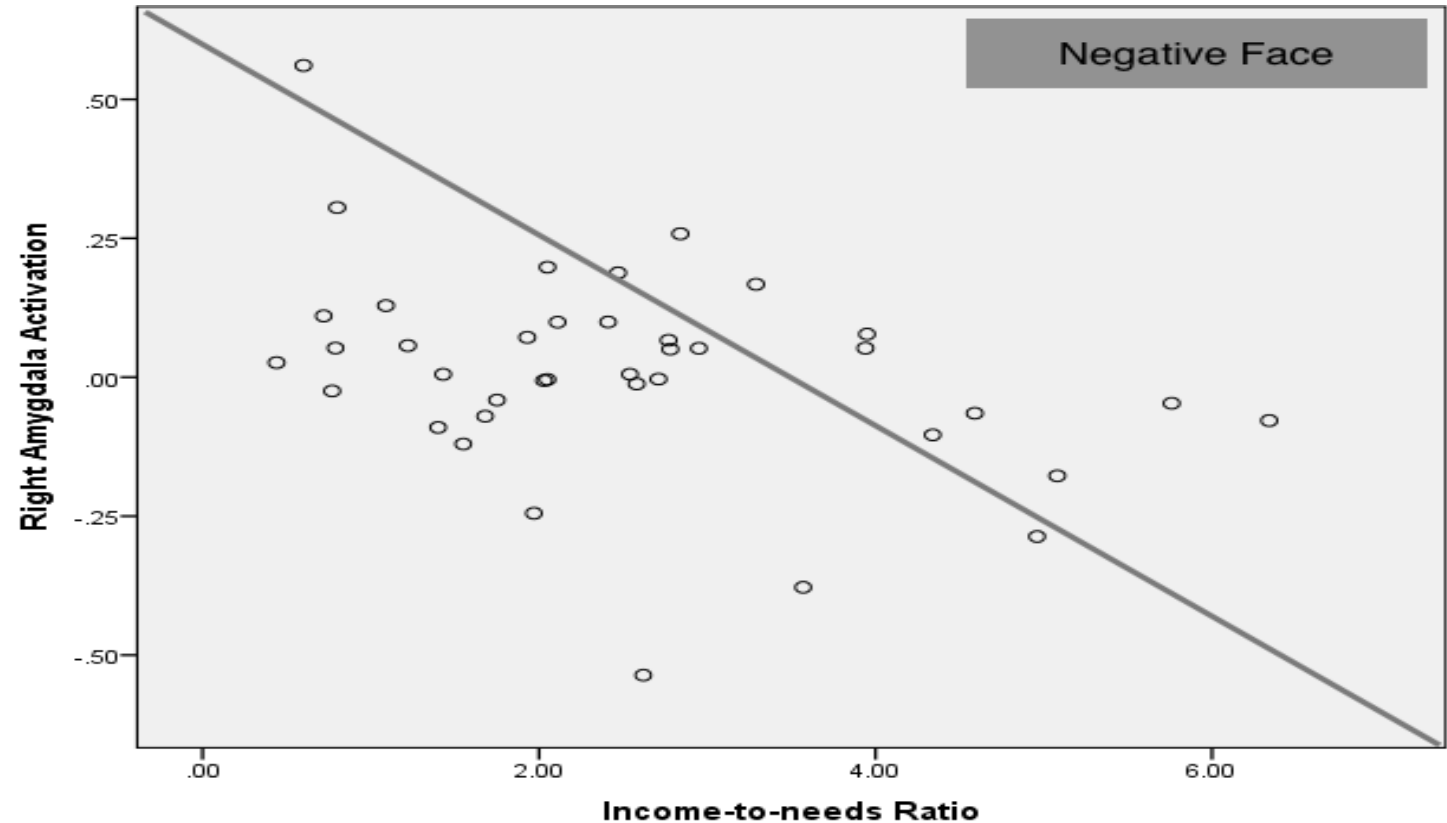


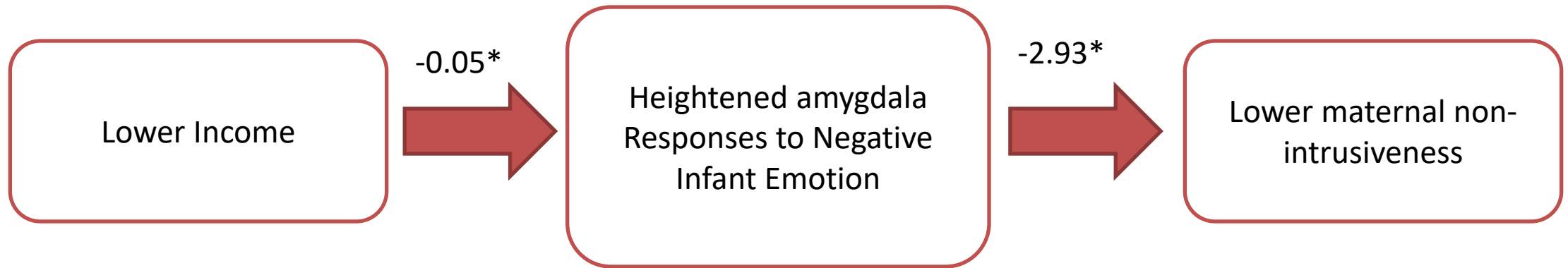
# Lower income is associated with heightened amygdala responses to negative infant emotion.

- 2-way interactions [Emotion X Income]



$x, y, z = 26, -4, -19, k=42, p<.05, SVC$





\*p < 0.05

- *Can socioeconomic disadvantage get into maternal brain?*
  - Differential amygdala responses to infant emotional cues among first-time new mothers
    - decreased salience of positive cues from infants
    - increased salience of negative cues from infants
- *Are the differential amygdala responses associated with maternal behaviors?*
  - The increased amygdala sensitivity to infants' distress cues are linked to more intrusive maternal behaviors
  - May be part of maternal expression of threat vigilance and protectiveness
  - Adaptive maternal responses to highly stressful and unpredictable environments

# Further discussion – Risk and Resilience in contexts

- How can intervention support/change the adaptive and maladaptive biological processes in children and parents?



## Acknowledgements



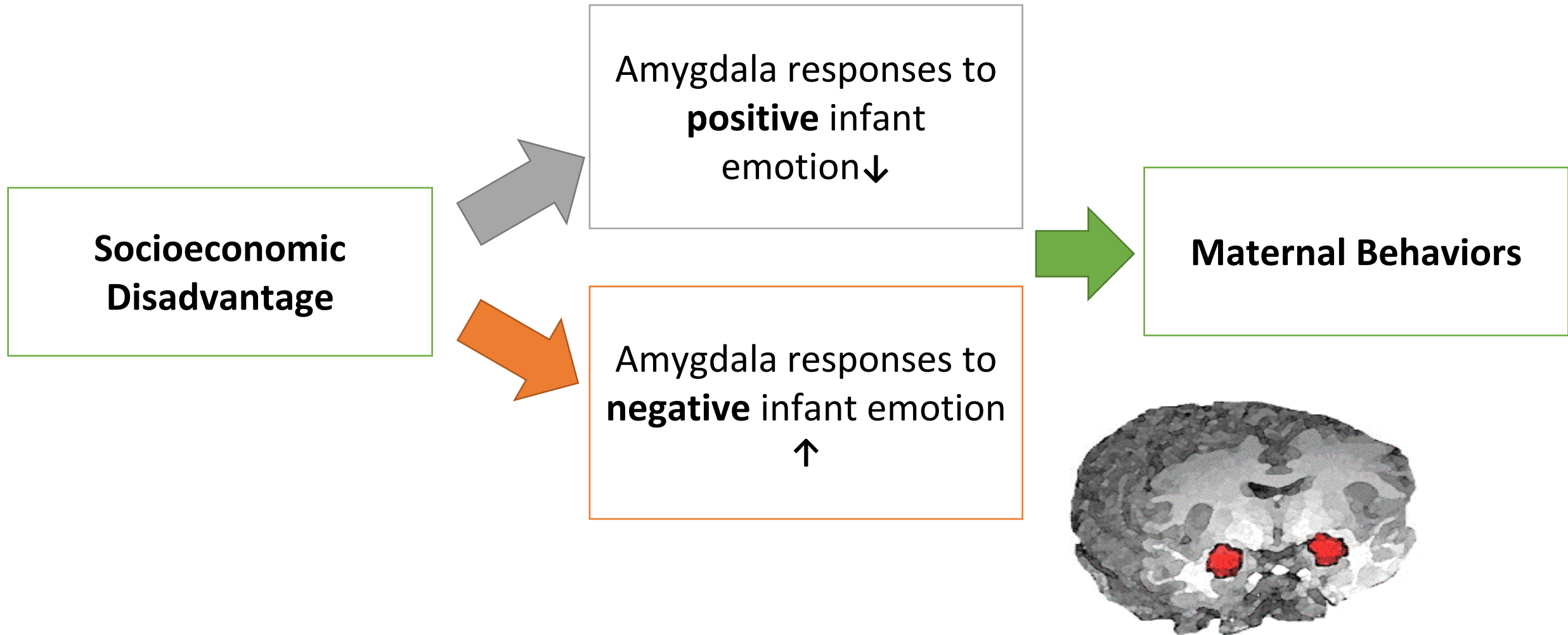
UNIVERSITY of  
DENVER

- Funding
  - National Institute of Child Health and Human Development (NICHD) R01 HD090068 (PI: Kim)
  - National Institute of Child Health and Human Development (NICHD) R21 HD078797 (PI: Kim)
- The Victoria S. Levin Award For Early Career Success in Young Children's Mental Health Research, Society for Research in Child Development (SRCD)
- Families who participated in the study
- Family and Child Neuroscience Lab, University Denver

# fMRI paradigm

- Instruction: Attend to and experience naturally the emotional state elicited by each image
- Participants viewed color images of positive, negative, and neutral expressions of infants.
- Faces were presented for 2000 ms followed by an average 1250-ms fixation cross (ranging from 500ms to 5350ms). A run included 90 face trials (30 trials of each expression).
- The order of the images were pseudo-randomized

# The Current Study





# Participants and Measures

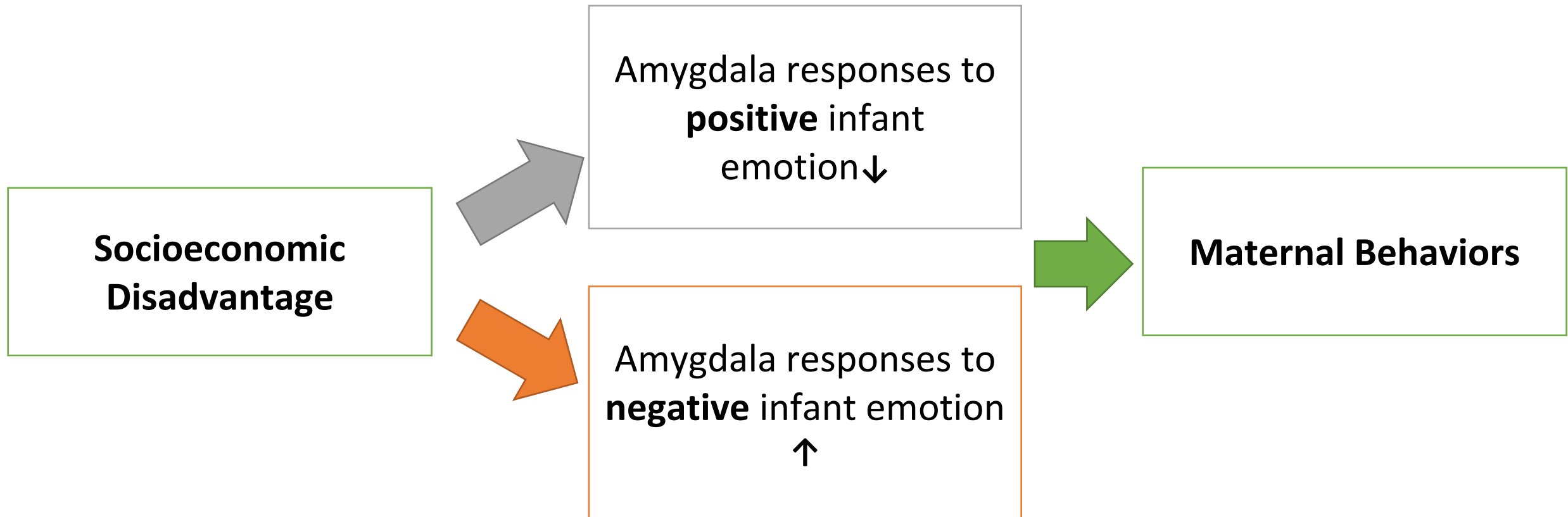
- 39 first-time new mothers whose infants were healthy and had experienced no delivery complications
  - Age:  $24.41 \pm 5.22$  (range 18-36)
  - 43% Caucasian, 41% Hispanic, 5% African-American
  - Postpartum months:  $3.97 \pm 1.58$  (range 0-6)
- Income-to-needs ratio
  - Family and work history interview (e.g. Evans & Kim, 2012)
  - Mean = 2.47 (range = 0.44-6.34)
    - Below 2 is low-income

# Maternal Behaviors

Mother-infant naturalistic interactions for 15 minutes

- The Emotional Availability Scales (Biringen, 2008)
- Sensitivity: the ability of the mother to be appropriately emotionally connected to her infant and responsive to the infant's needs
  - be positive and accepting while attending to the shifting demands of the infant as the dyadic relationship unfolds
- Non-intrusiveness: the extent to which the mother follows her infant's lead in the interaction and interrupts the flow of play in a smooth manner.
  - is available to the infant but does not overpower the infant's will or impose her own sense of how the interaction should go.





# Can Upward Mobility Cost You Your Health?

By GREGORY E. MILLER, EDITH CHEN, and GENE H. BRODY

- Some young people respond to the pressure by doubling down on character strengths that have served them well, cultivating an even more determined persistence to succeed. This strategy, however, can backfire when it comes to health. *Behaving diligently all of the time leaves people feeling exhausted and sapped of willpower. Worn out from having their noses to the grindstone all the time, they may let their health fall by the wayside, neglecting sleep and exercise, and like many of us, overindulging in comfort foods.*

# Parenting Effects and Skin-deep Resilience

- Protective roles of supportive parenting throughout the childhood
  - Natural variations at home
  - Changes associated with the intervention
- Resilience has a double-edged sword for African American Youths
  - Academic success and psychological adjustment
  - Greater vulnerability to physical health problems