

# Resilience to Adversity and the Early Origins of Disease

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# Collaborators (in alphabetical order)

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Gregory E. Miller, Tianyi Yu, and the Staff of the  
Center for Family Research, University of Georgia

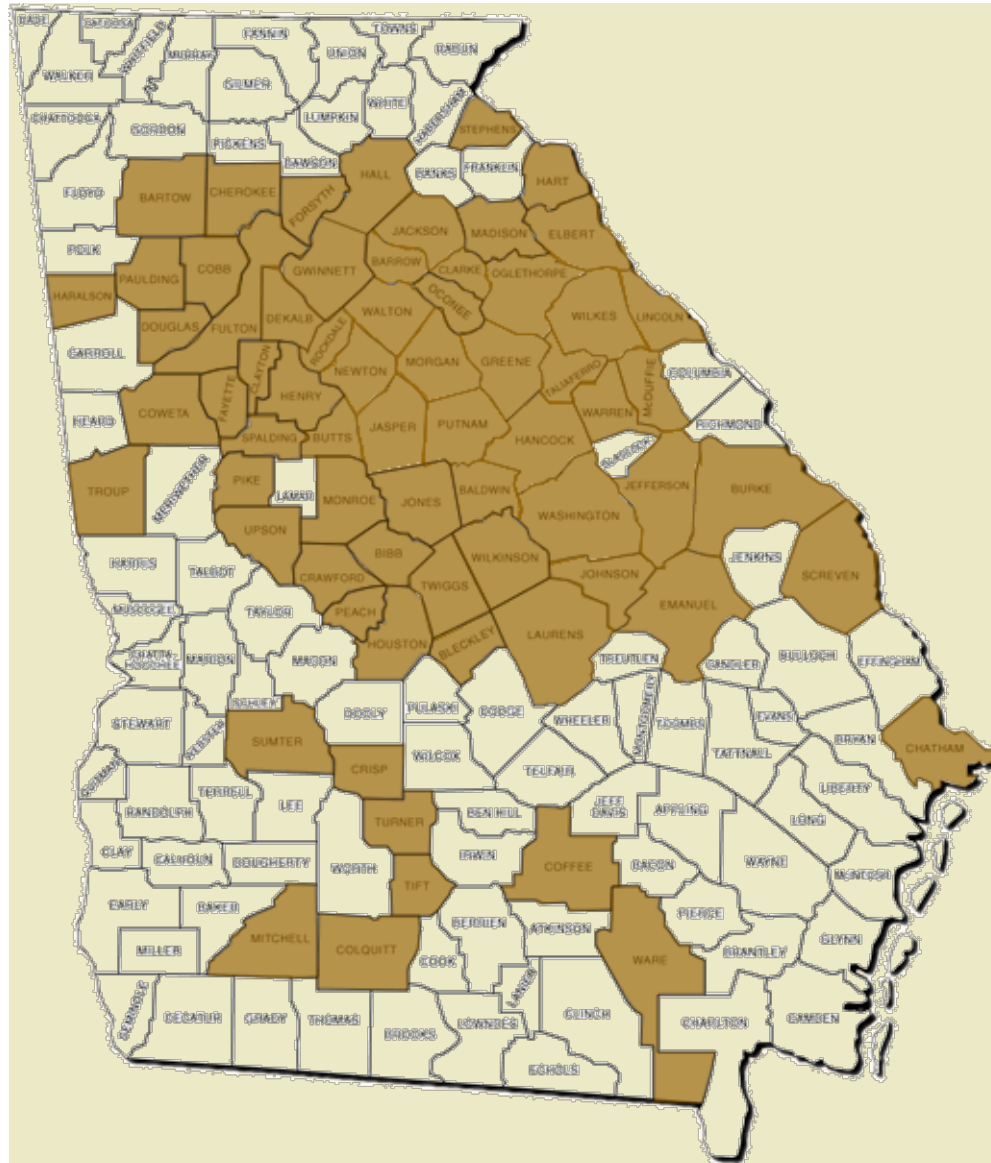
# Overview of Topics

- The rural South as a developmental context for African Americans
- Testing “weathering” hypotheses with indicators of allostatic load and epigenetic aging
- A cautionary note: Is resilience “just skin deep”?
- Health benefits of family-centered prevention programs

# Counties Comprising the Southeastern “Black Belt”



# Where We Conduct Research



# TESTING THE WEATHERING HYPOTHESIS

# Allostatic Load

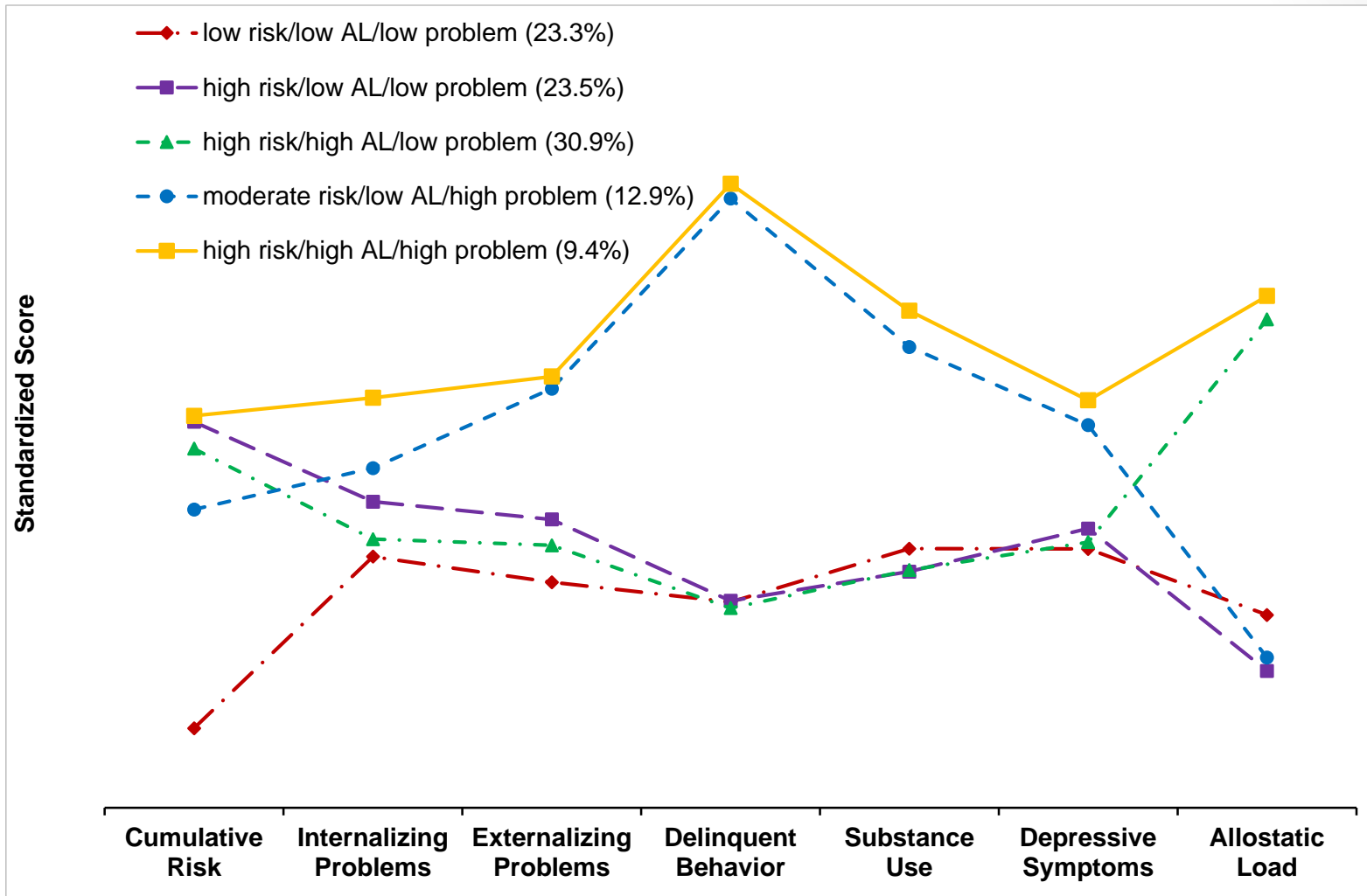
- Allostatic Load
  - A marker of chronic physiologic stress and cumulative wear and tear on the body
  - Indexed by elevated physiologic activity across multiple systems (McEwen, 2000)
    - Sympathetic adrenomedullary system: epinephrine/norepinephrine
    - Hypothalamic-pituitary-adrenal (HPA) axis: cortisol
    - Lipid metabolism: body mass index
    - Indices of inflammation and immune functioning: C-reactive protein
- Forecasts chronic diseases
  - Hypertension
  - Cardiac disease
  - Diabetes
  - Stroke

# Epigenetic Aging

- Measures of epigenetic aging
  - Reflect the disparity between an individual's biological and chronological ages
  - Faster epigenetic aging rates have been documented in tumor-derived cells from more than 20 cancers, as well as liver biopsies from obese patients
  - Predicted higher risks for all-cause mortality in four large cohorts
  - Two epigenetic metrics calculated:
    - Horvath's clock (2013), which aggregated normalized methylation values from 353 CpG sites
    - Hannum's clock (2013), which was estimated by summing weighted methylation values from 71 CpG sites using coefficients validated for peripheral blood mononuclear cells (PBMC)

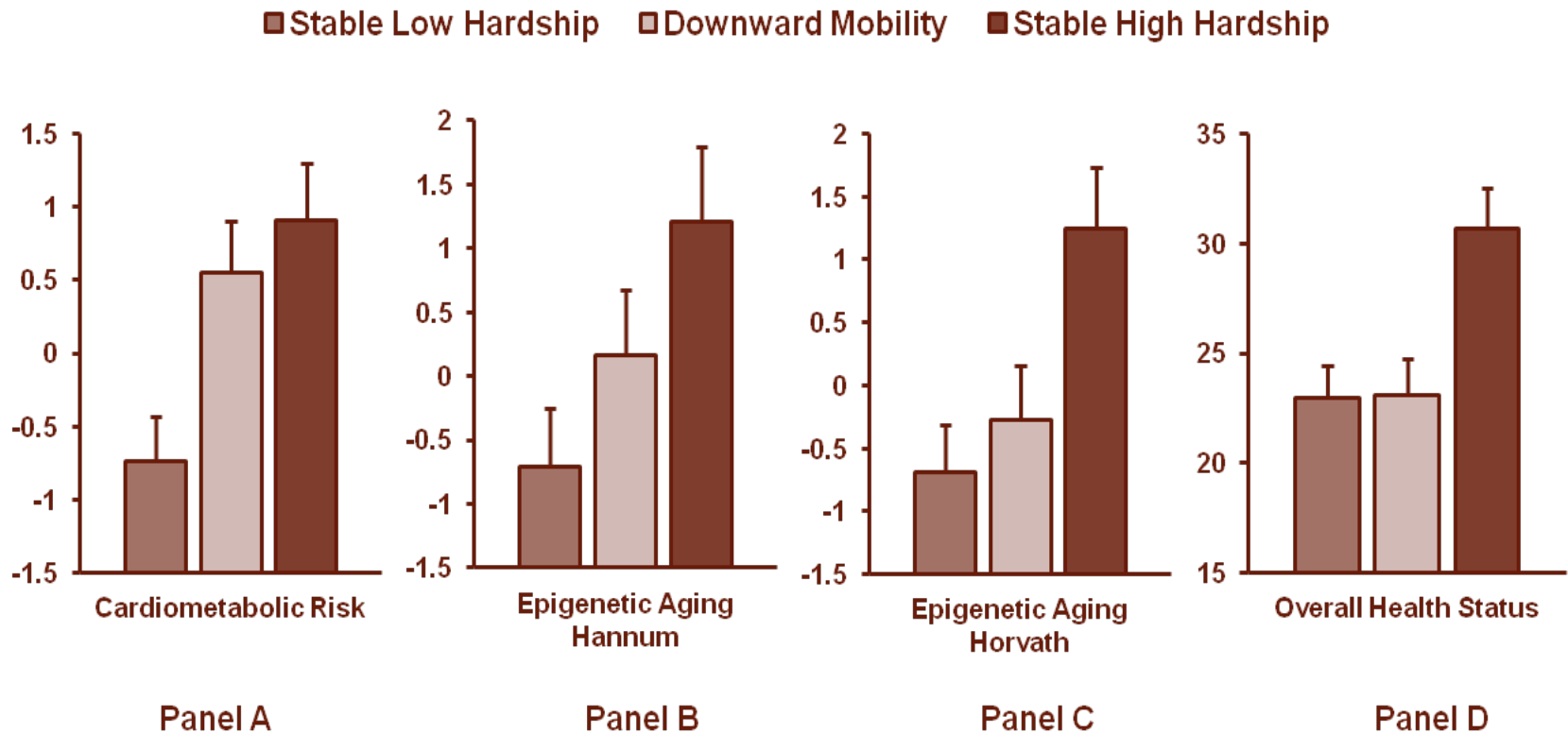


# Foreshadowing a Counterintuitive Pattern in the Health Disparities Literature During Adolescence



Brody, Yu, Chen, Kogan, Evans, Beach, Windle, Simons, Gerrard, Gibbons, & Philibert. (2013). *Developmental Psychology*, 49, 913-927. doi:10.1037/a0028847

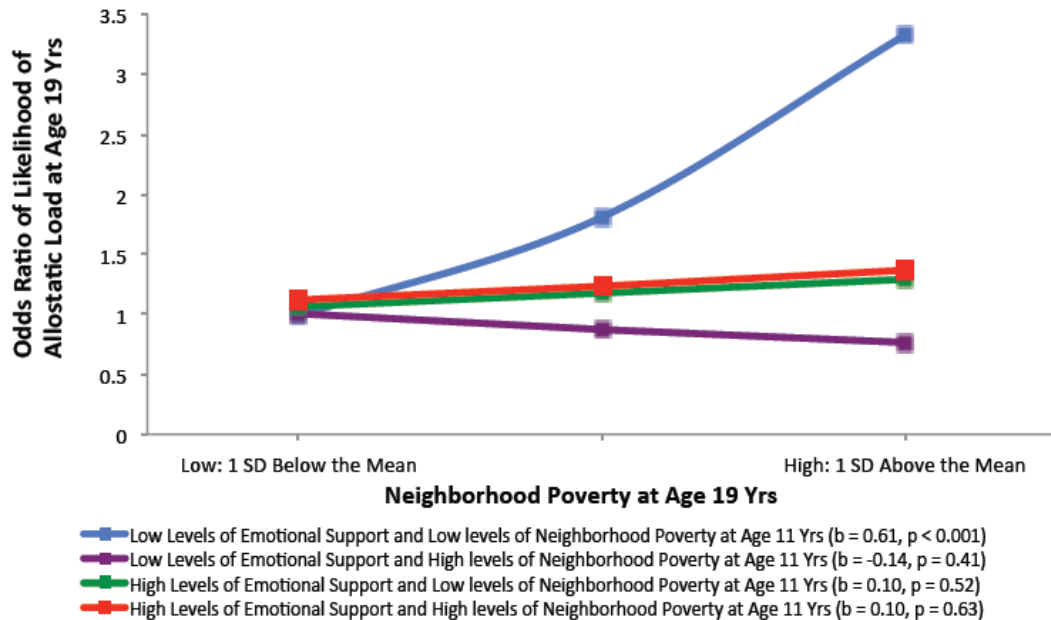
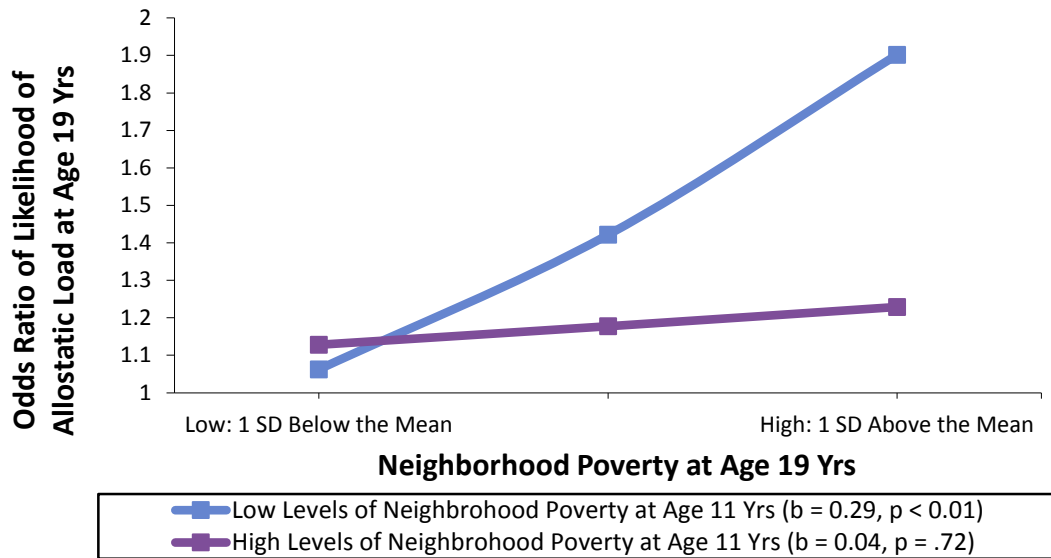
# The Great Recession and Health Risks for African American Youths: A Natural Experiment



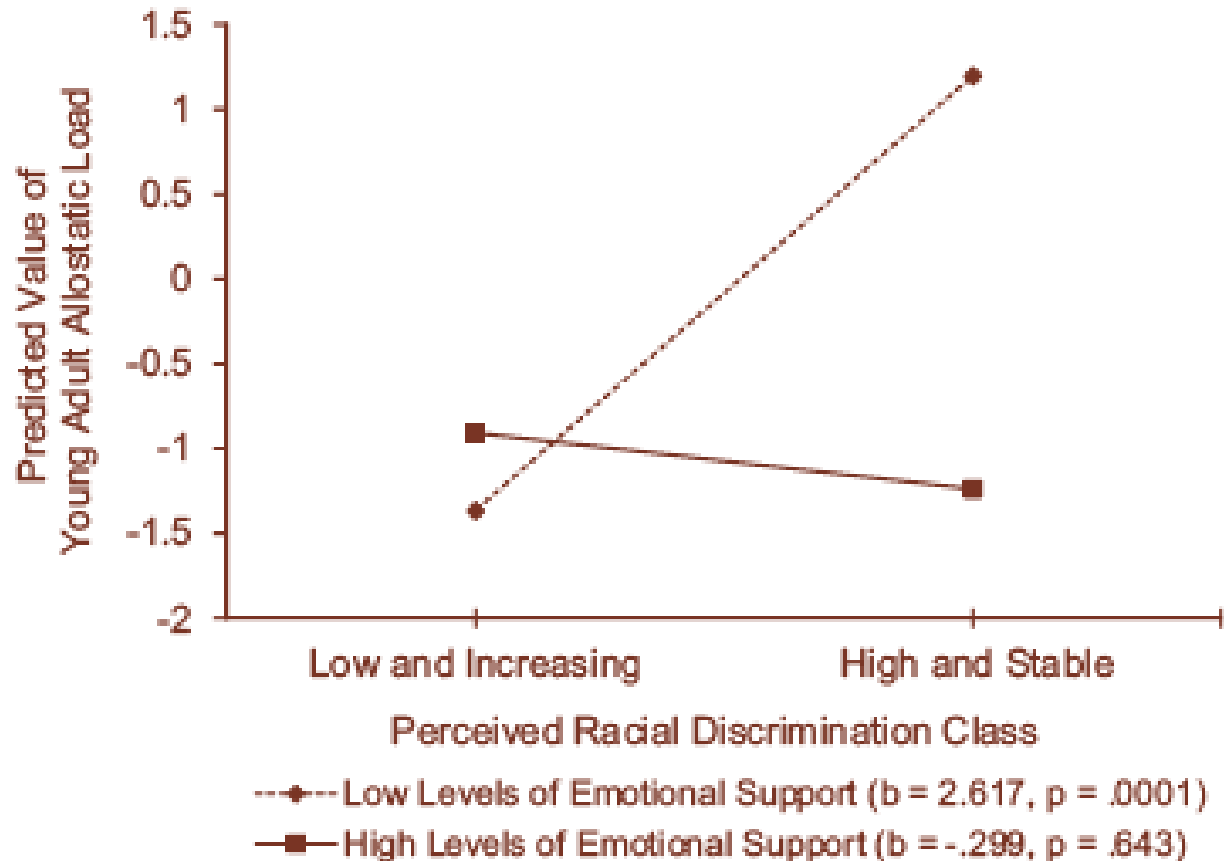
Chen, Miller, Yu, & Brody. (2016). The Great Recession and health risks in African American youth. *Brain, Behavior, and Immunity*, 53, 234-241. doi:10.1016/j.bbi.2015.12.015

# Neighborhood Dynamics and Allostatic Load

Brody, Lei, Chen, & Miller. (2014).  
Neighborhood poverty and  
allostatic load in African American  
youths. *Pediatrics*, 134, 1-8.  
doi:10.1542/peds.2014.1395



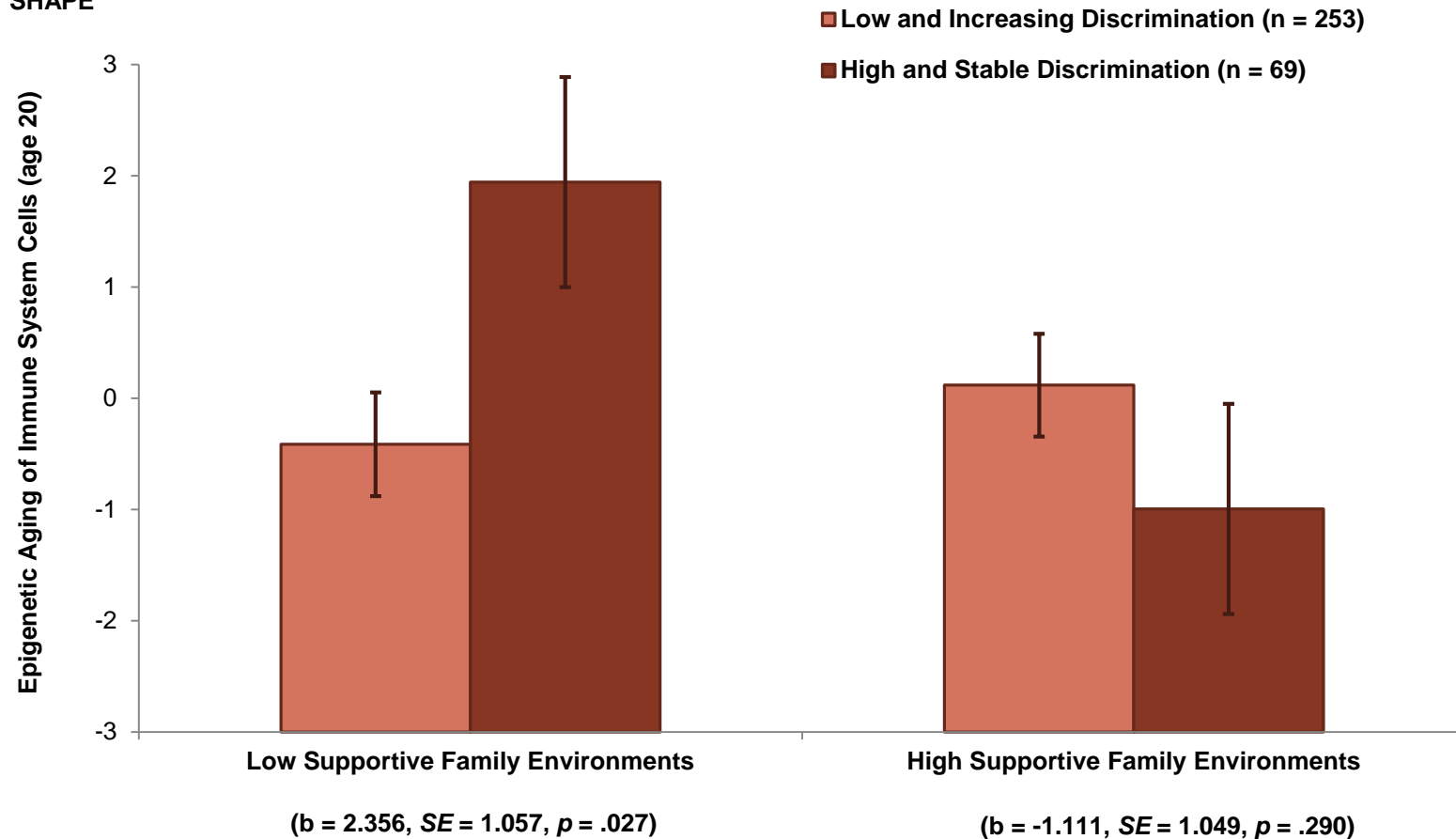
# Discrimination, Allostatic Load, and Buffering



Brody, Lei, Chae, Yu, Kogan, & Beach. (2014). *Child Development*, 85, 989-1002. doi:10.1111/cdev.12213

# Discrimination and Accelerated Aging: A Replication Across Two Longitudinal Studies—Study 1: SHAPE

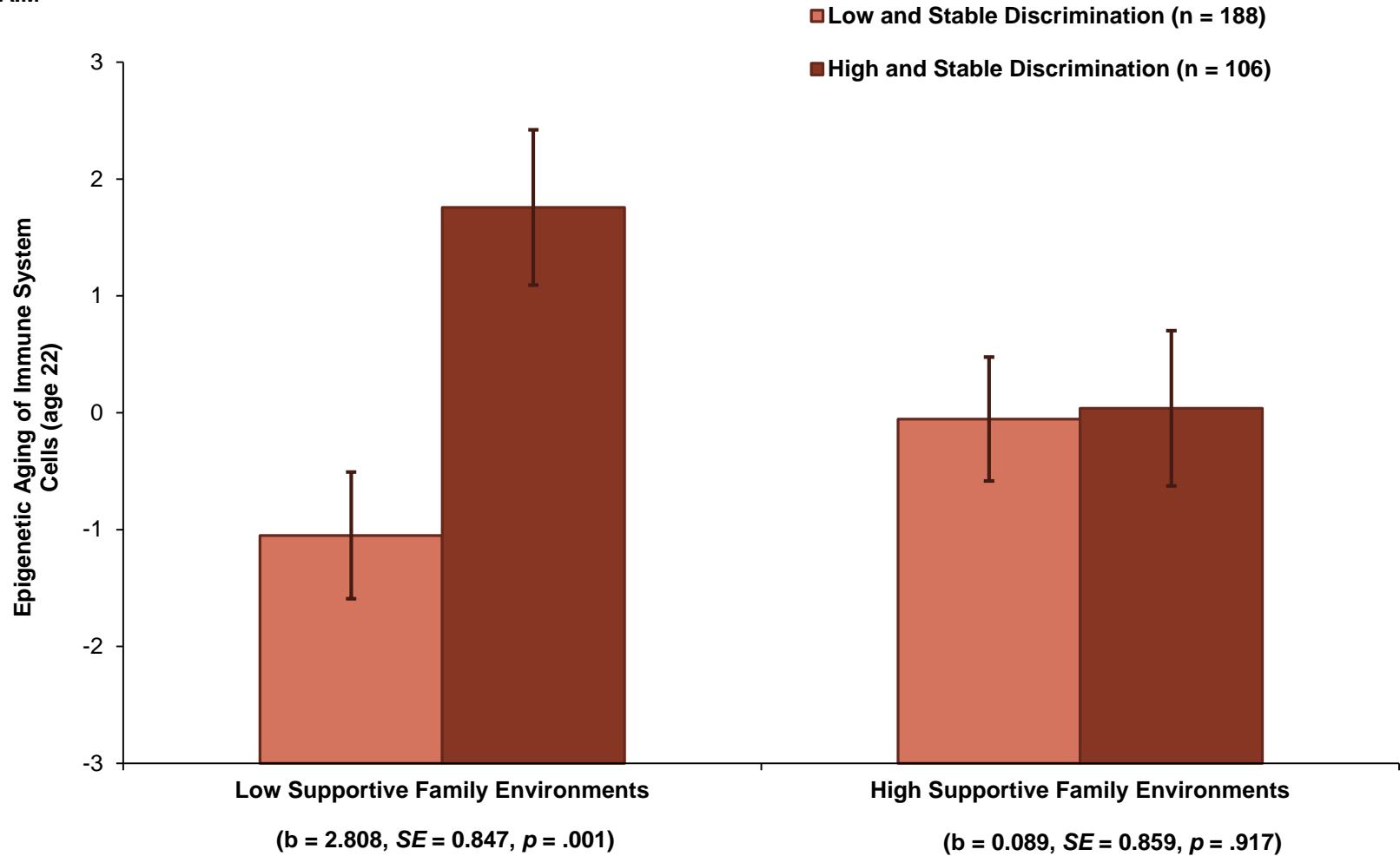
## SHAPE



Brody, Miller, Yu, Beach, & Chen. (2016). Supportive family environments ameliorate.... *Psychological Science*, 27, 530-541. doi:10.1177/0956797615626703

# Study 2: AIM

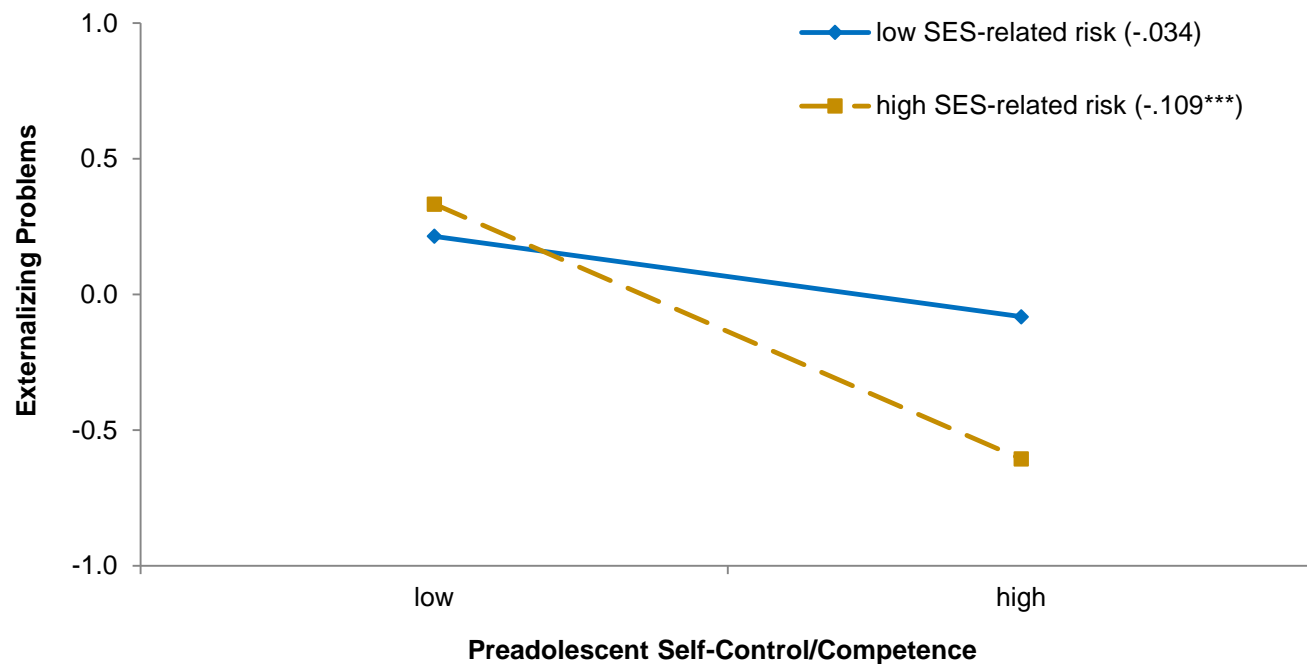
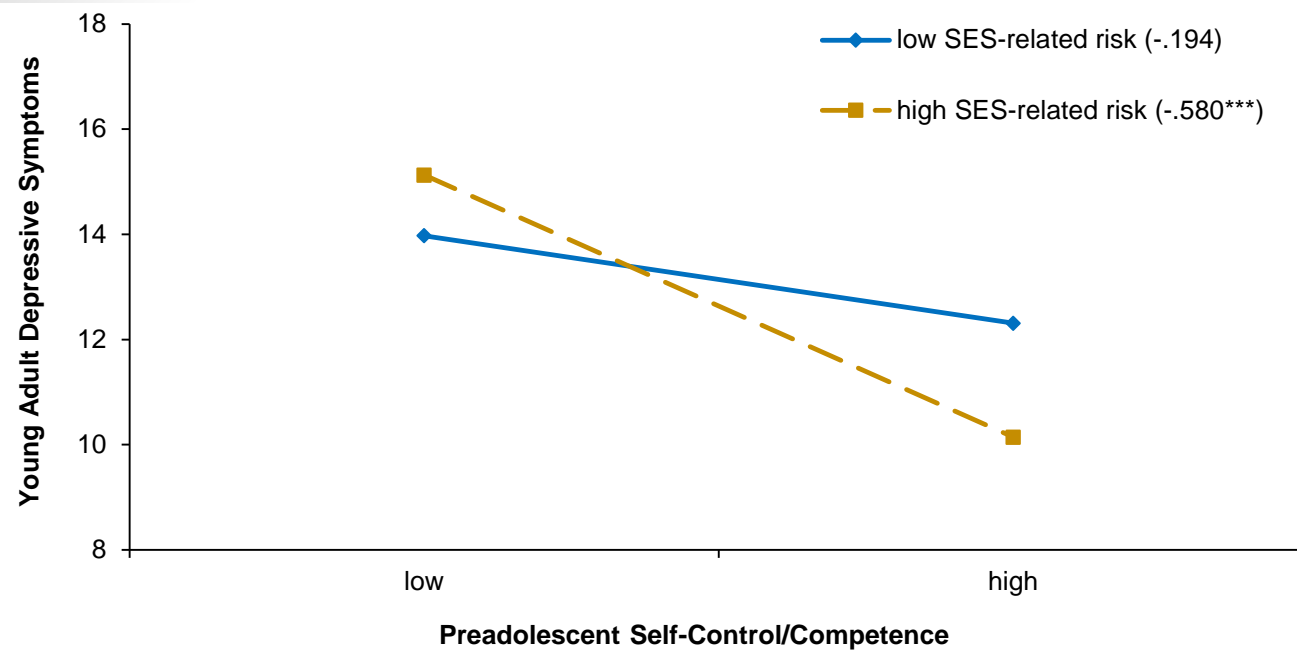
AIM



# Is Resilience Only Skin Deep?

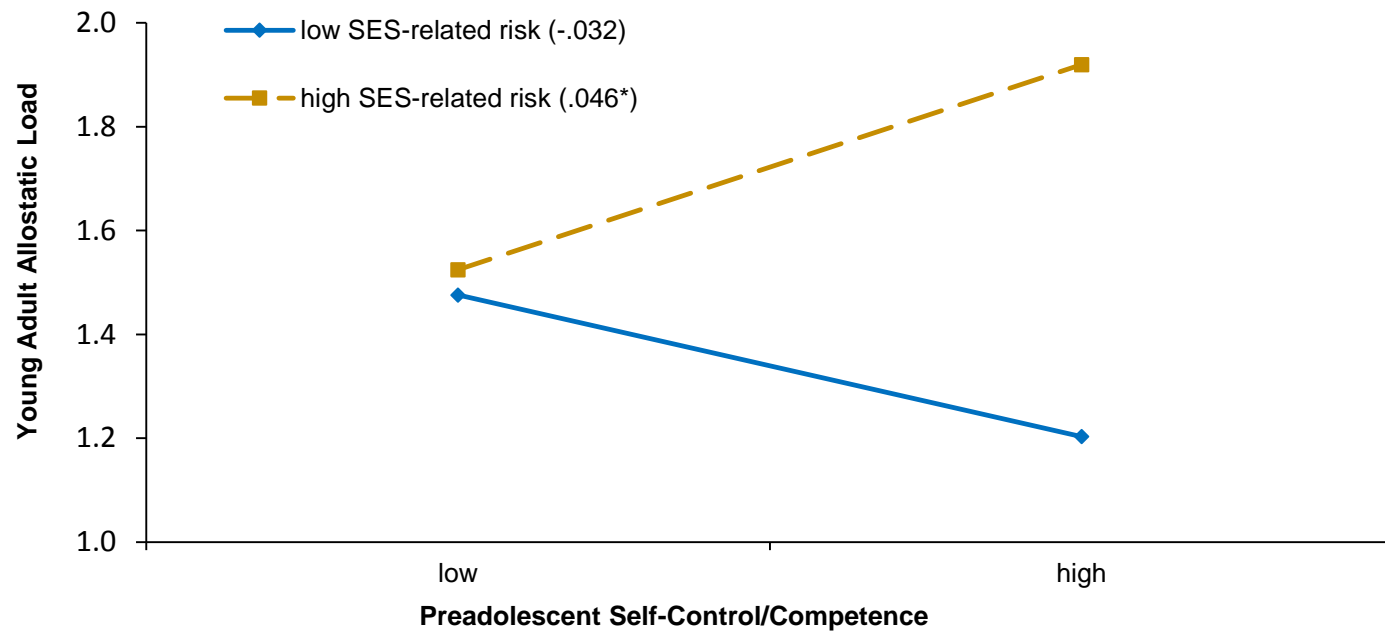
## A Cautionary Note

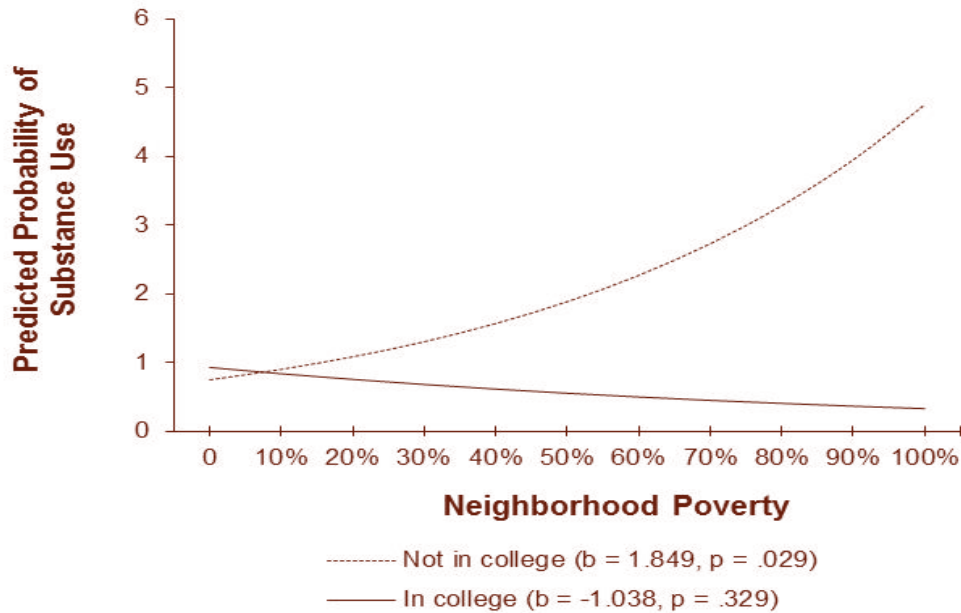
- Widespread assumption in the resilience literature
  - Children have successfully negotiated adversities, “beaten the odds,” and become resilient if
    - Their externally observable behaviors are characteristic of good adjustment, for example,
      - They excel academically
      - They have high self-esteem



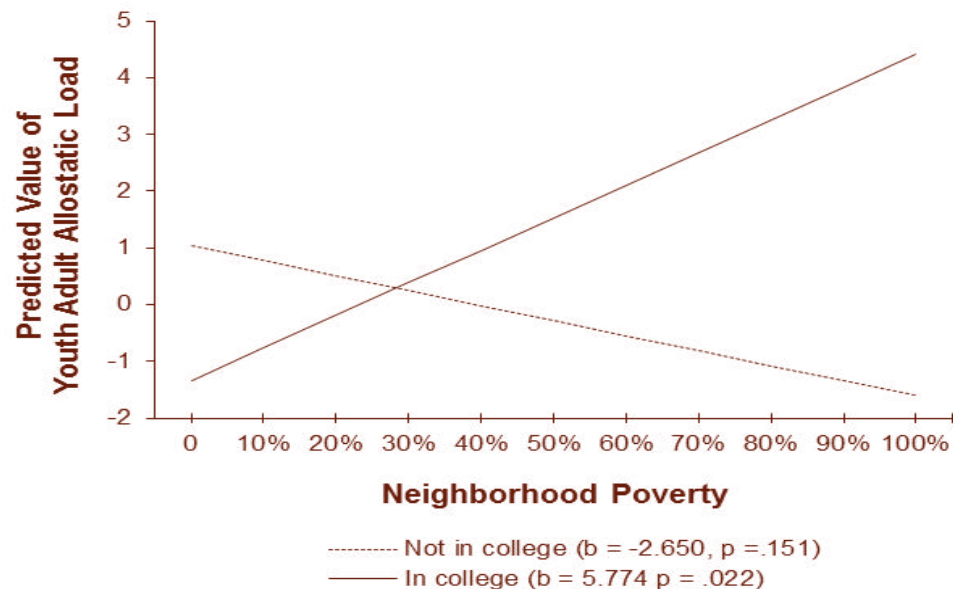
Brody, Yu, Chen,  
Miller, & Kogan.  
(2013). Is resilience  
only skin deep?....  
*Psychological  
Science*, 24, 1285-  
1293.  
doi:10.1177/0956797  
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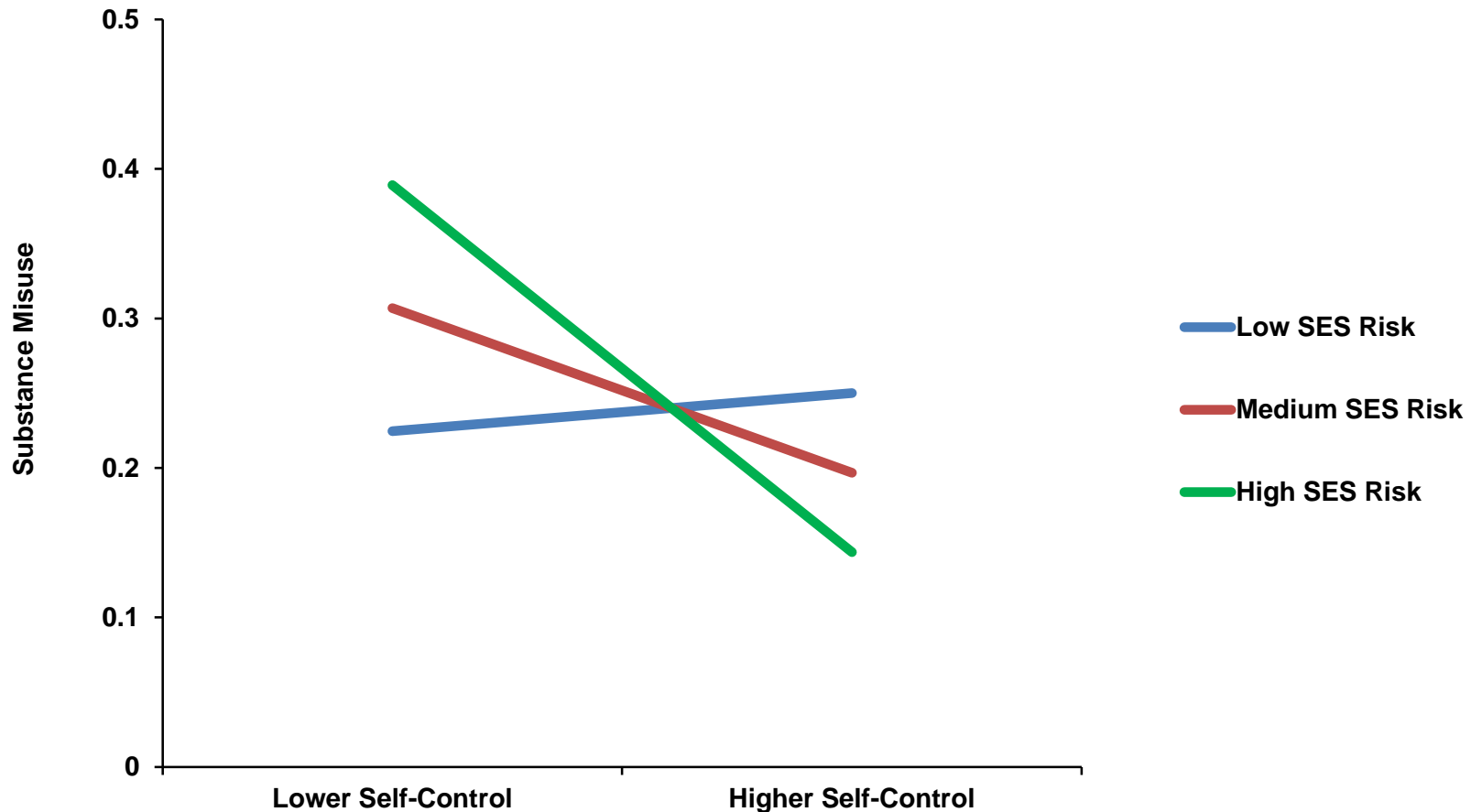




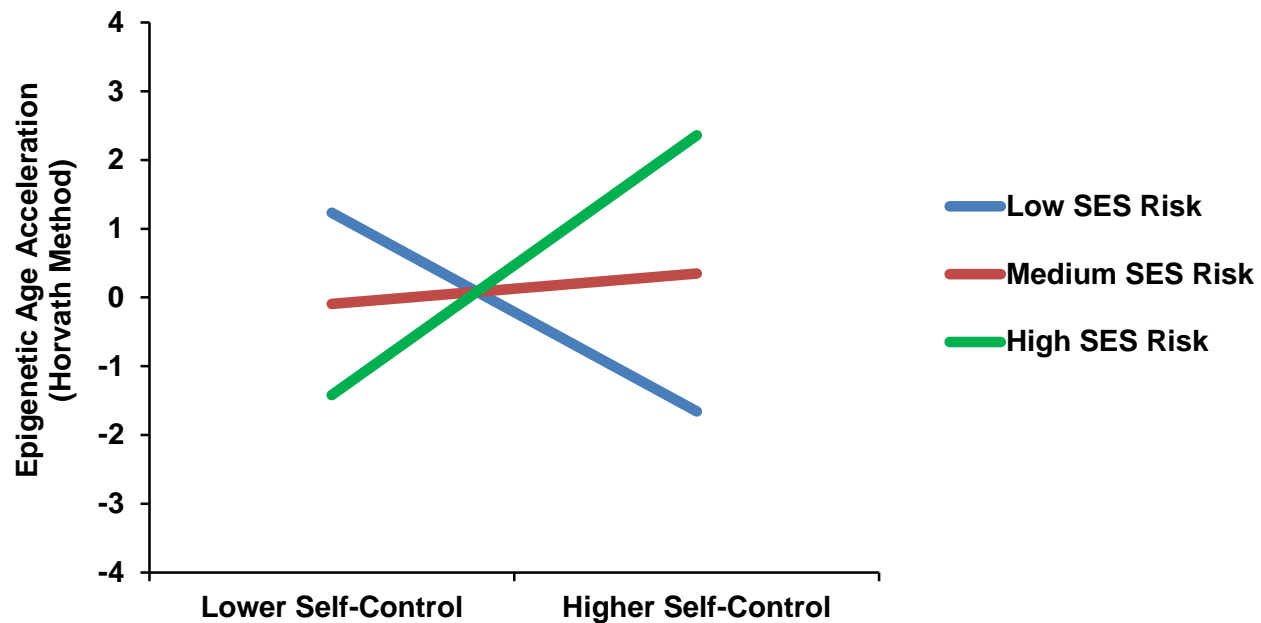
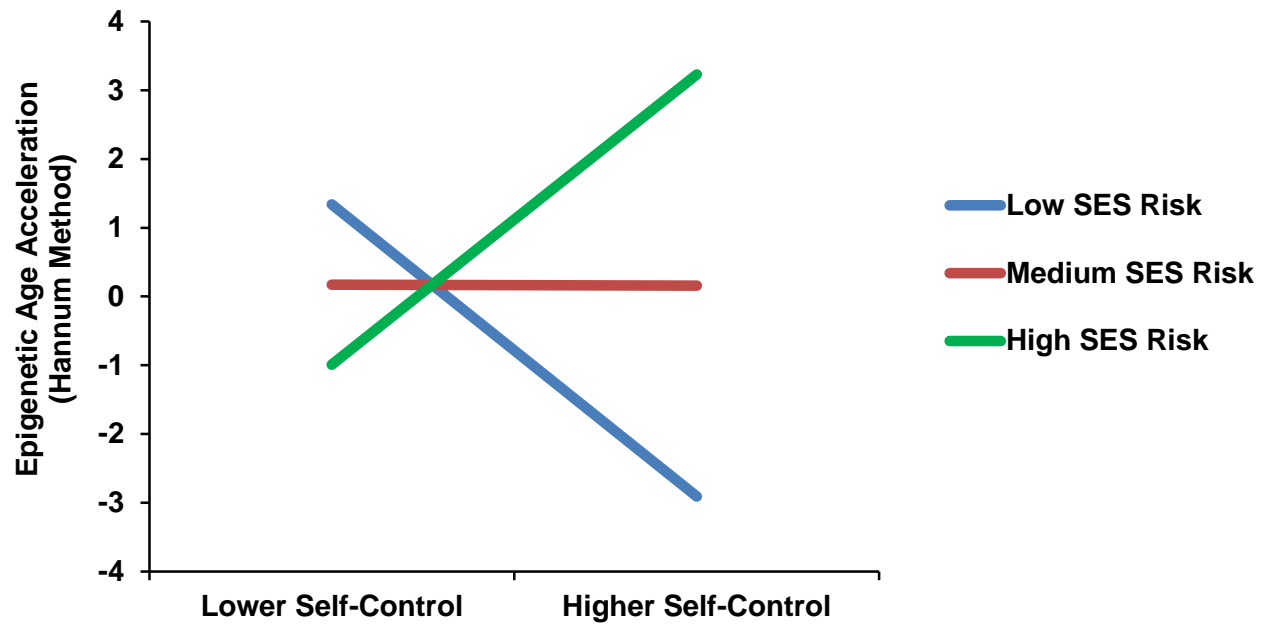
Chen, Miller, Brody, & Lei.  
(2015). Neighborhood poverty,  
college attendance, and  
diverging profiles.... *Clinical  
Psychological Science*, 3, 675-  
685. doi:10.1177/  
2167702614546639

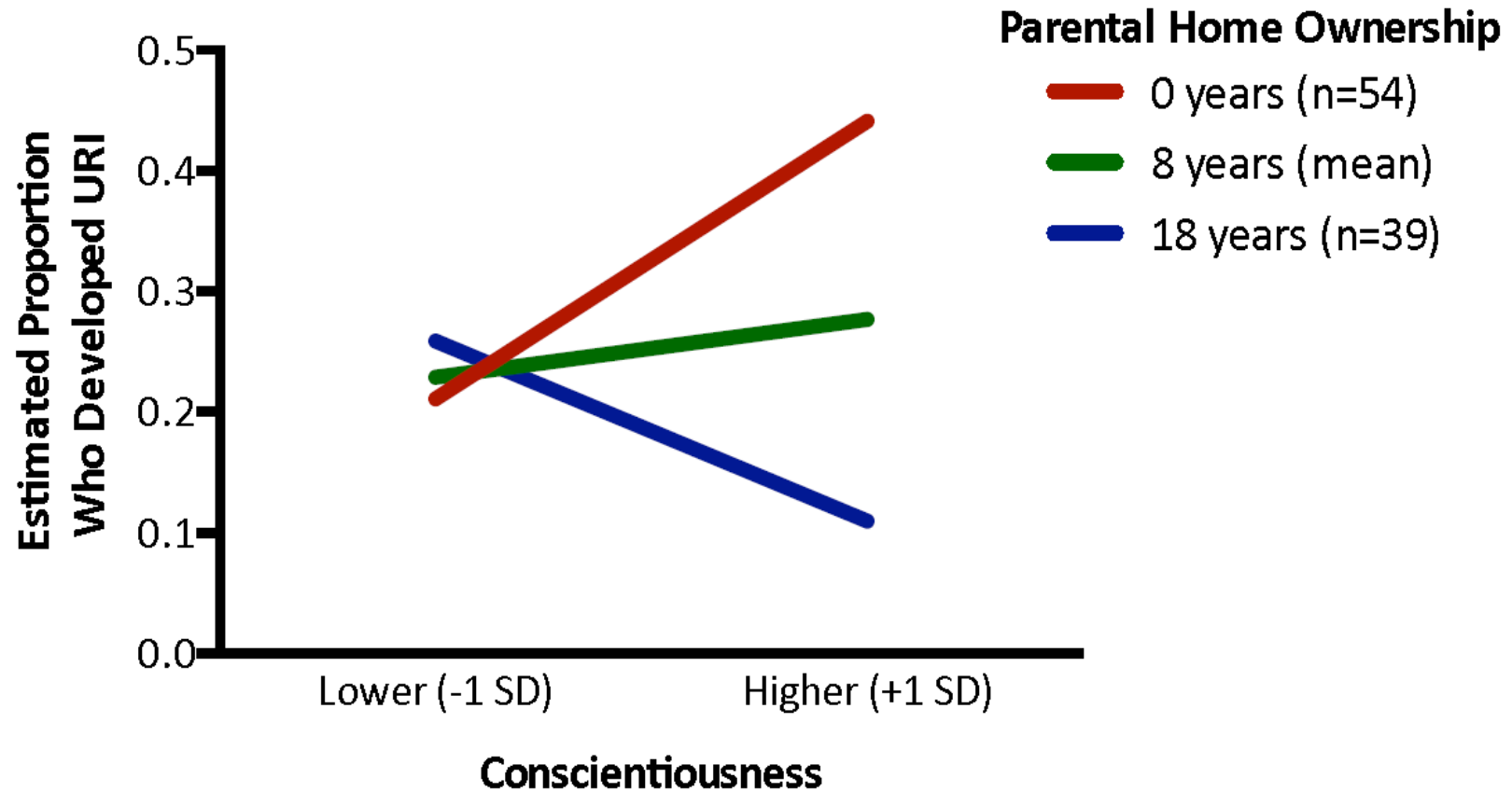


# Skin-Deep Resilience: Self-Control Forecasts Better Psychosocial Outcomes But Fosters Epigenetic Aging



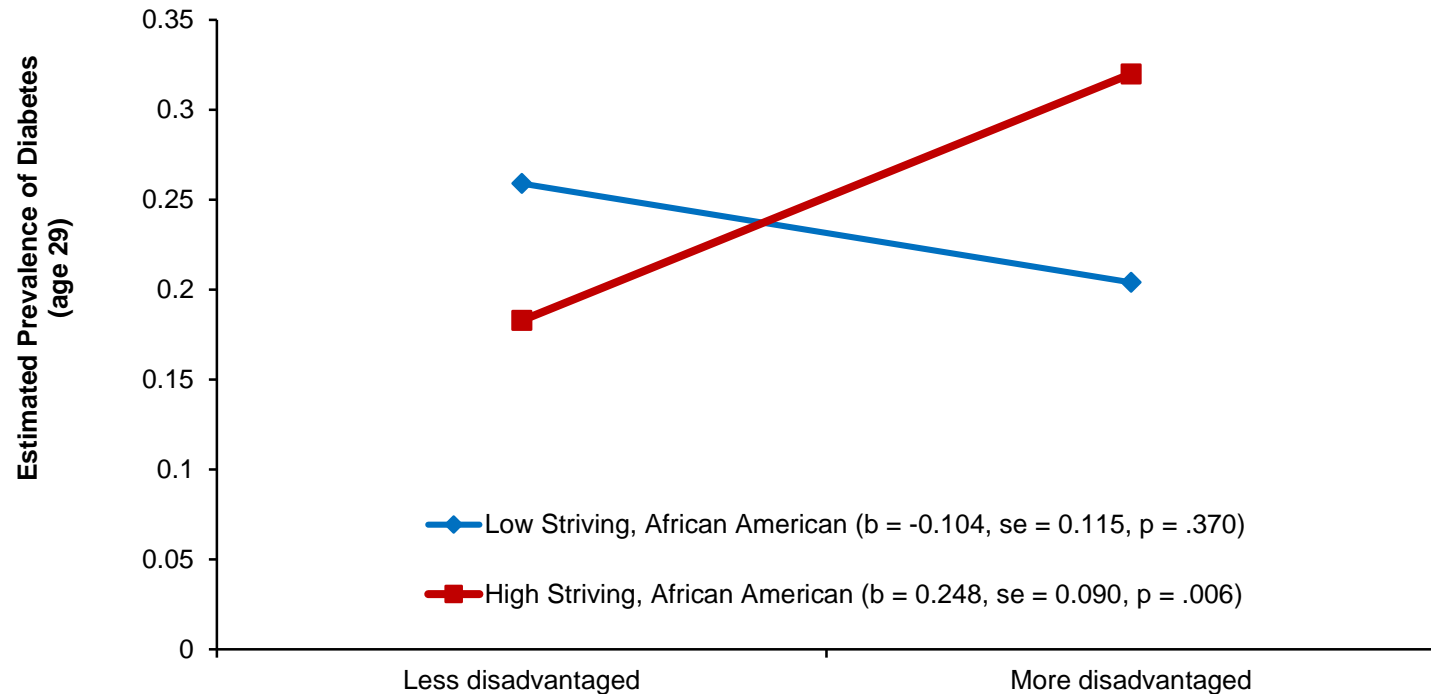
Miller, Yu, Chen, & Brody. (2015). Self control forecasts better psychosocial outcomes but fosters epigenetic aging in low-SES youth. *PNAS*, 112, 10325-10330. doi:10.1073/pnas.1505063112





Miller, Cohen, Janicki-Devers, Brody, & Chen. (2016, August 8). Viral challenge reveals further evidence of skin-deep resilience in African Americans from disadvantage backgrounds. *Health Psychology*. Advance online publication. doi:10.1037/hea0000398

# Does the Skin-Deep Resilience Pattern Predict Chronic Disease?



Brody, Yu, Miller, & Chen. (in press). Resilience in adolescence, health, and psychosocial outcomes. *Pediatrics*.

# The New York Times

## Opinionator

*Exclusive Online Commentary From The Times*

January 4, 2014

### **Can Upward Mobility Cost You Your Health?**

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

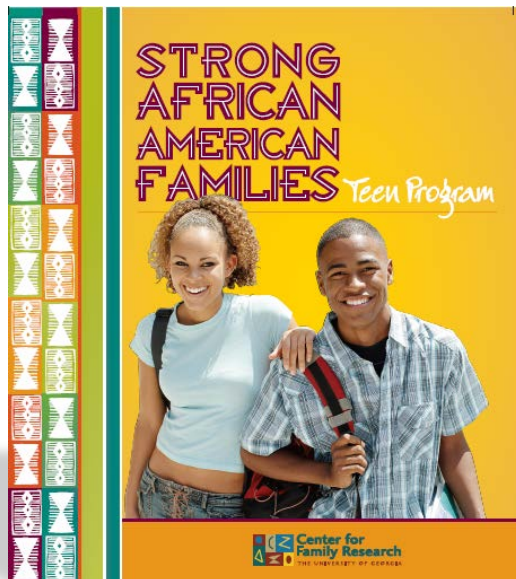
<http://opinionator.blogs.nytimes.com/2014/01/04/can-upward-mobility-cost-you-yourhealth/?ref=opinion>

# FAMILY-CENTERED PREVENTION EFFECTS ON HEALTH OUTCOMES

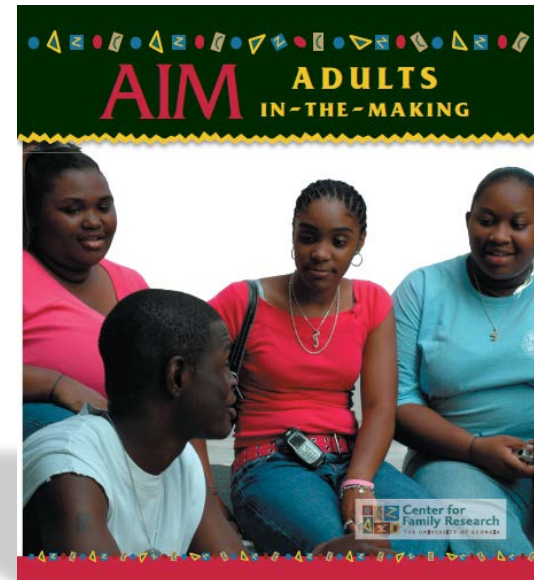




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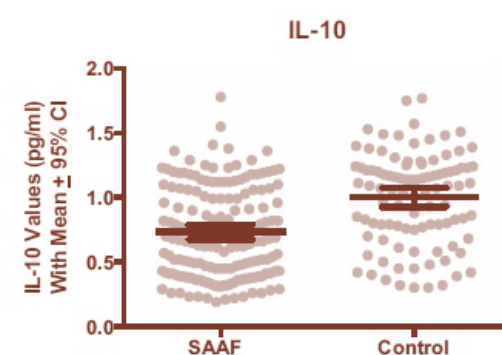
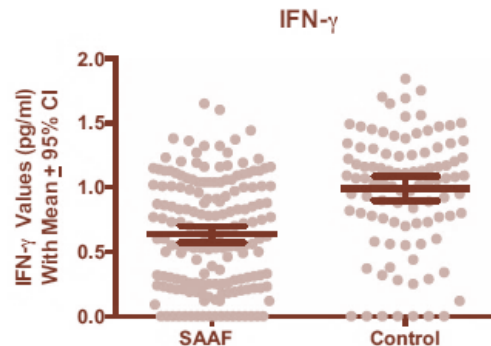
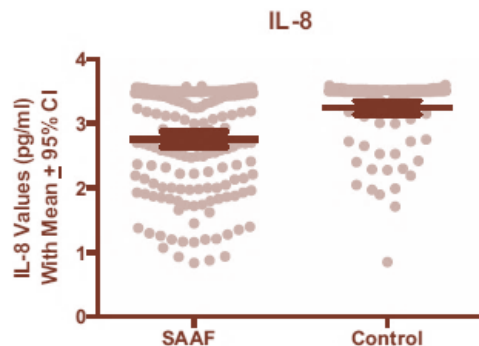
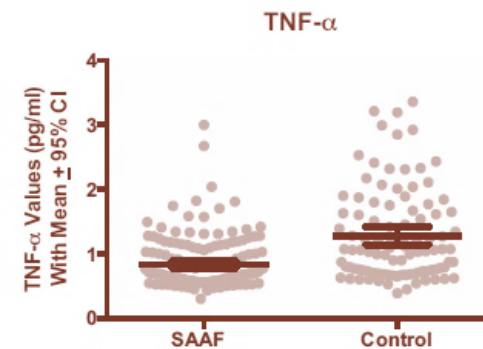
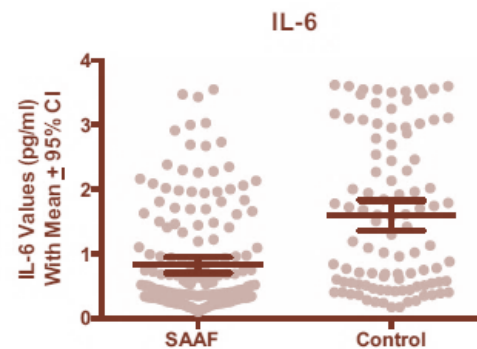
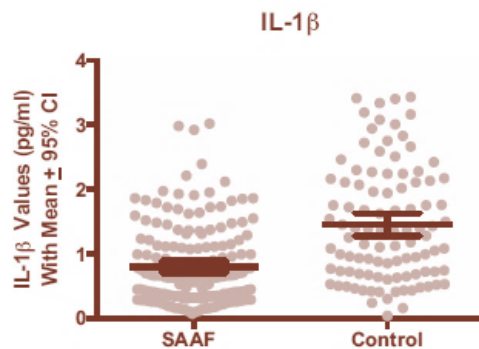
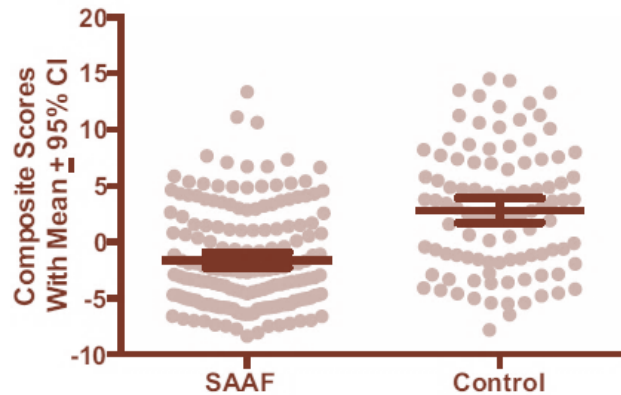
\*Brody et al. (2004). *Child Development*, 75, 900-917. doi:10.1111/j.1467-8624.2004.00713.x

\*\*Brody et al. (2012). *Pediatrics*, 129, 108-115. doi:10.1542/peds.2011-0623

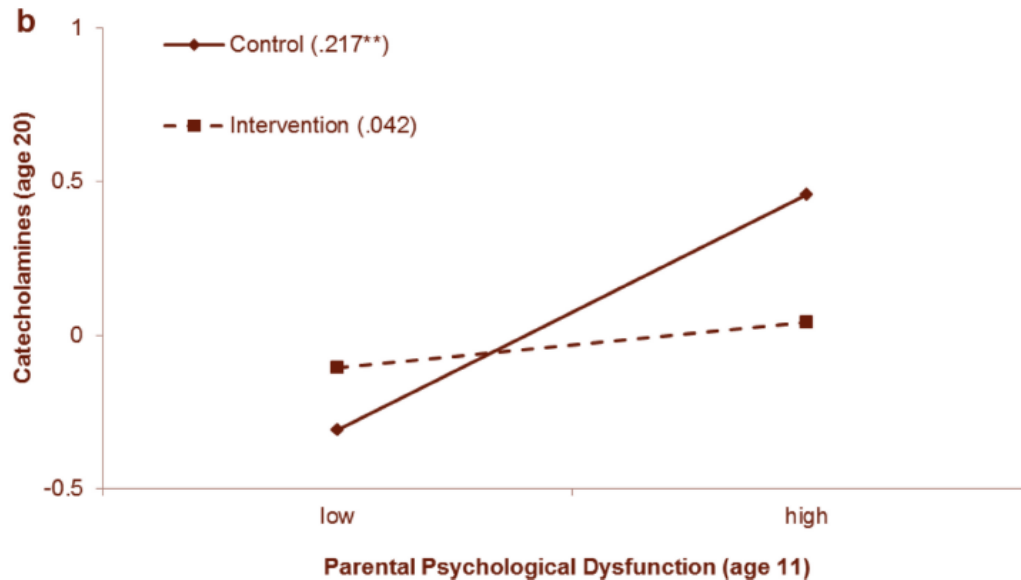
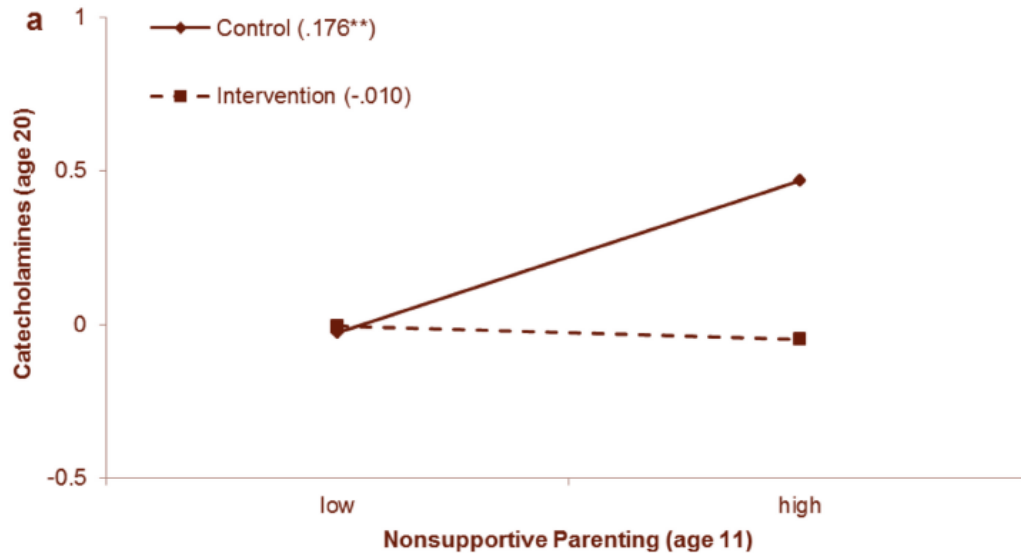
\*\*\*Brody et al. (2012). *Journal of Consulting and Clinical Psychology*, 80, 17-28. doi:10.1037/a0026592

# SAAF Effects on Cytokine Levels at Age 19

Miller, Brody, Yu, & Chen. (2014). A family-oriented psychosocial intervention reduces inflammation in low-SES African American youth. *PNAS*, 111, 11287-11292.  
doi:10.1073/pnas.1406578111

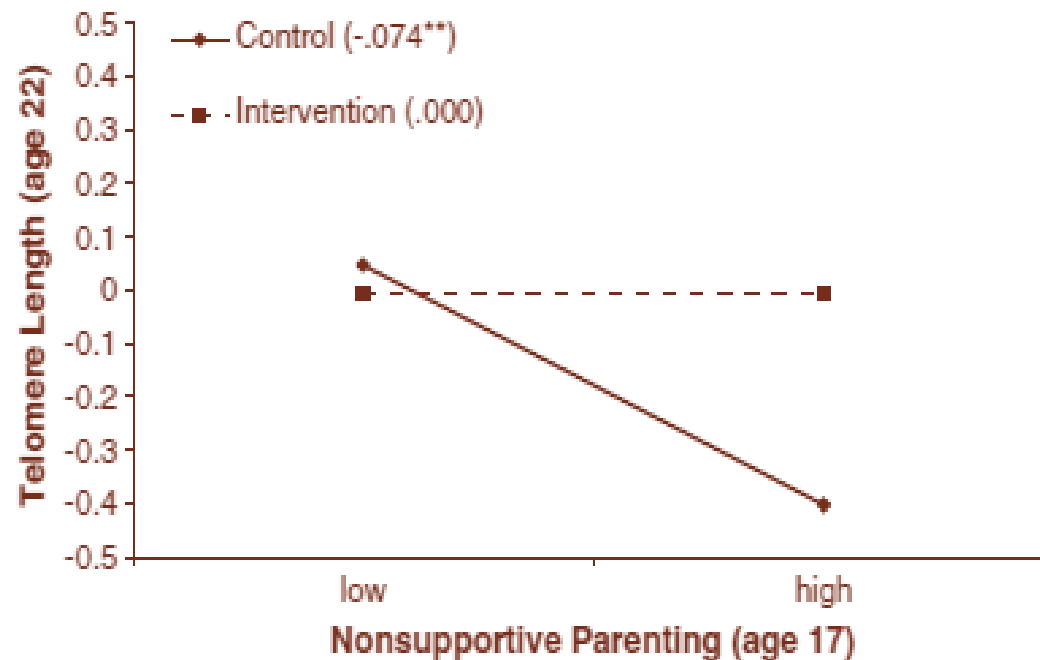


# Family Risks, SAAF, and Youth Catecholamine Levels



Brody, Yu, Chen, & Miller.  
(2014). Prevention moderates  
associations between family  
risks and youth catecholamine  
levels. *Health Psychology, 33*,  
1435-1439.  
doi:10.1037/hea0000072

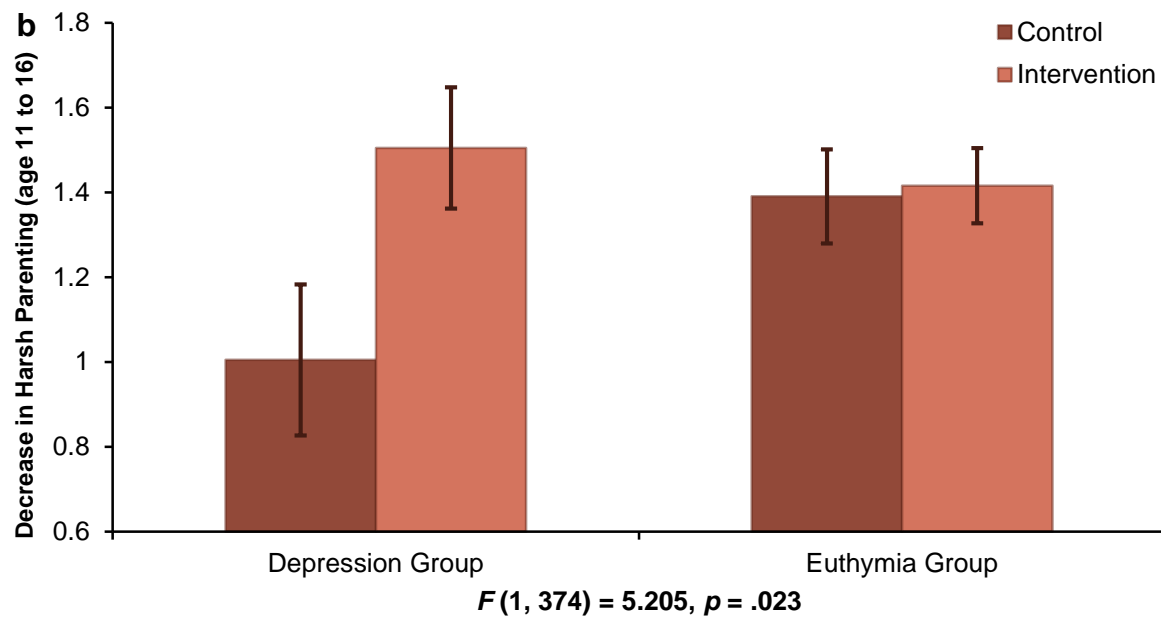
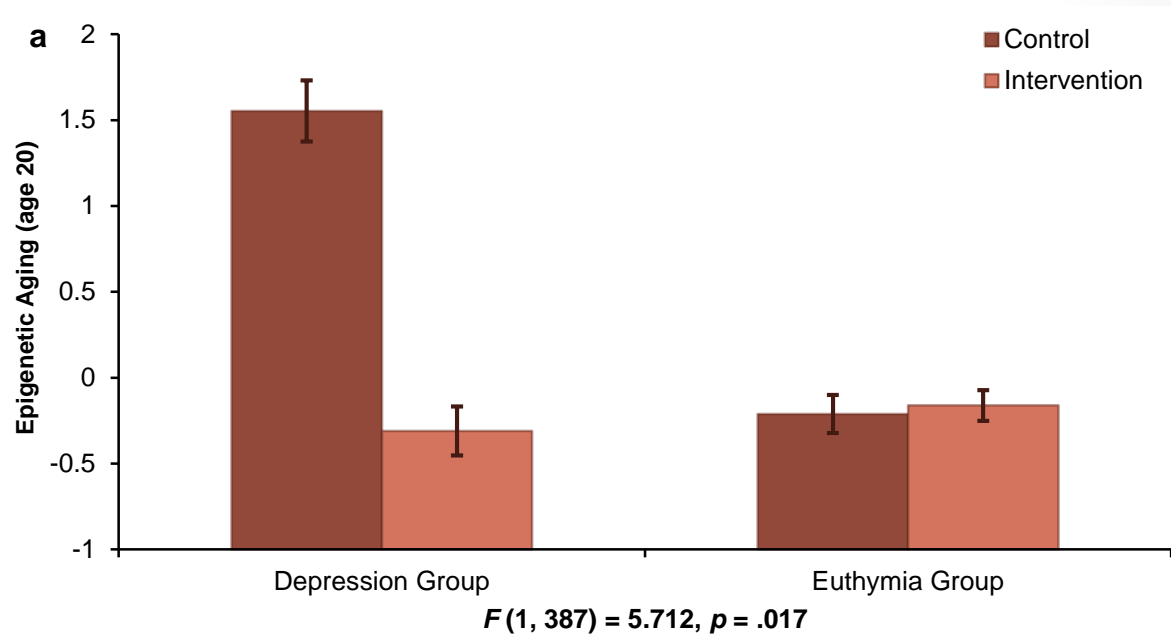
# Nonsupportive Parenting, AIM, and Diminished Telomere Length

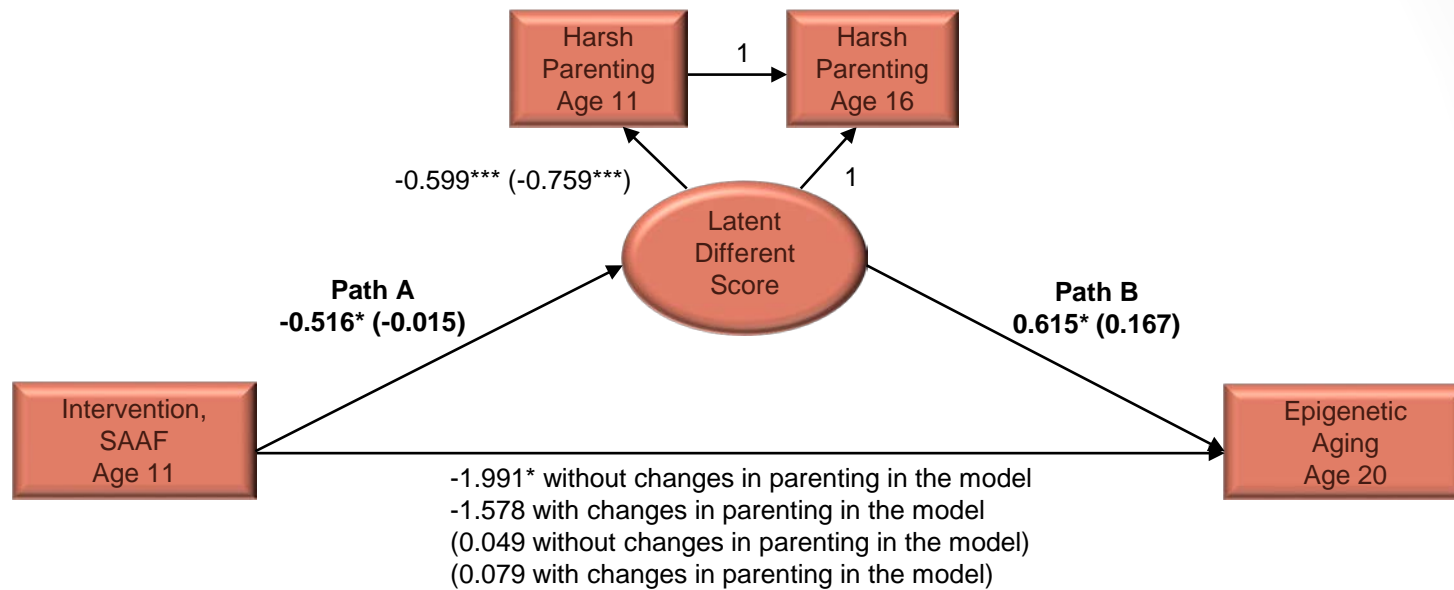


Brody, Yu, Beach, & Philibert. (2015). Prevention effects ameliorate.... *Prevention Science*, 16, 171-180.  
doi:10.1007/s11121-014-0474-2

# PREVENTION REDUCES EPIGENETIC AGING AMONG OFFSPRING OF PARENTS WITH DEPRESSION

Brody, Yu, Chen, Beach, & Miller. (2016). Family-centered prevention ameliorates the longitudinal association between risky family processes and epigenetic aging. *Journal of Child Psychology and Psychiatry*, 57, 566-574. doi:10.1111/jcpp.12495

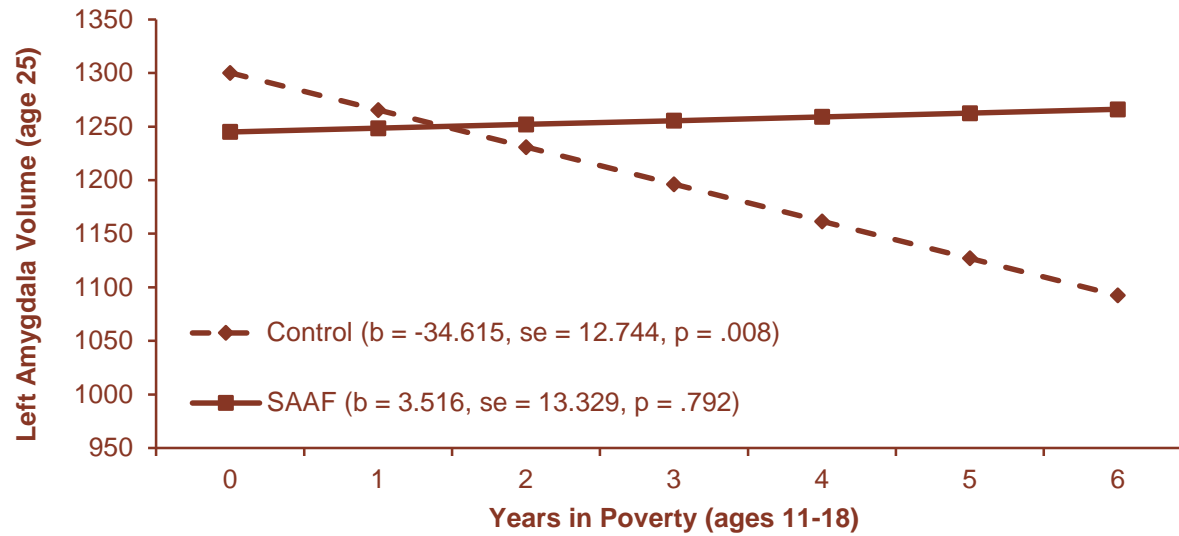
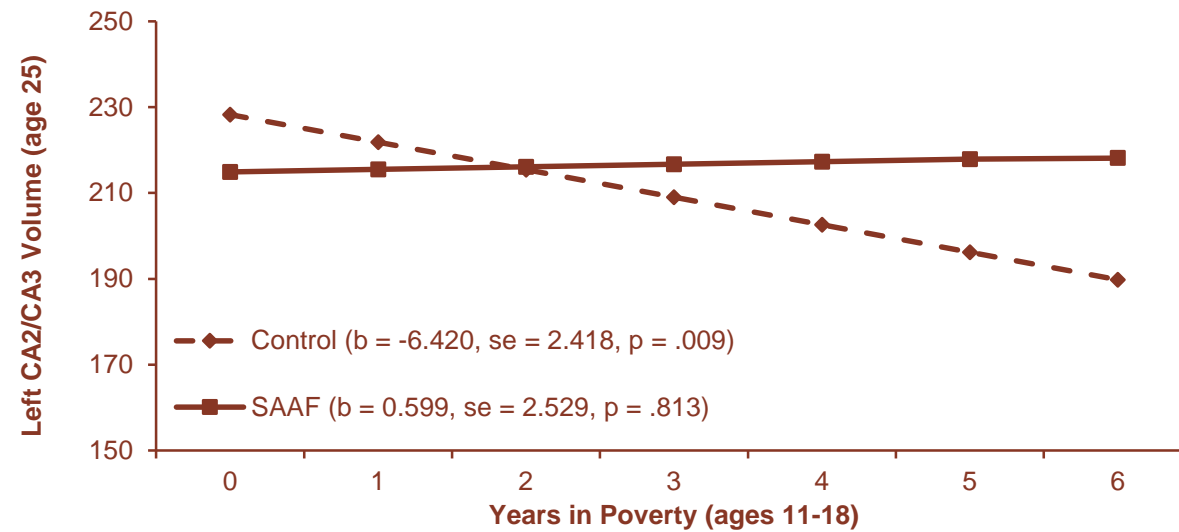




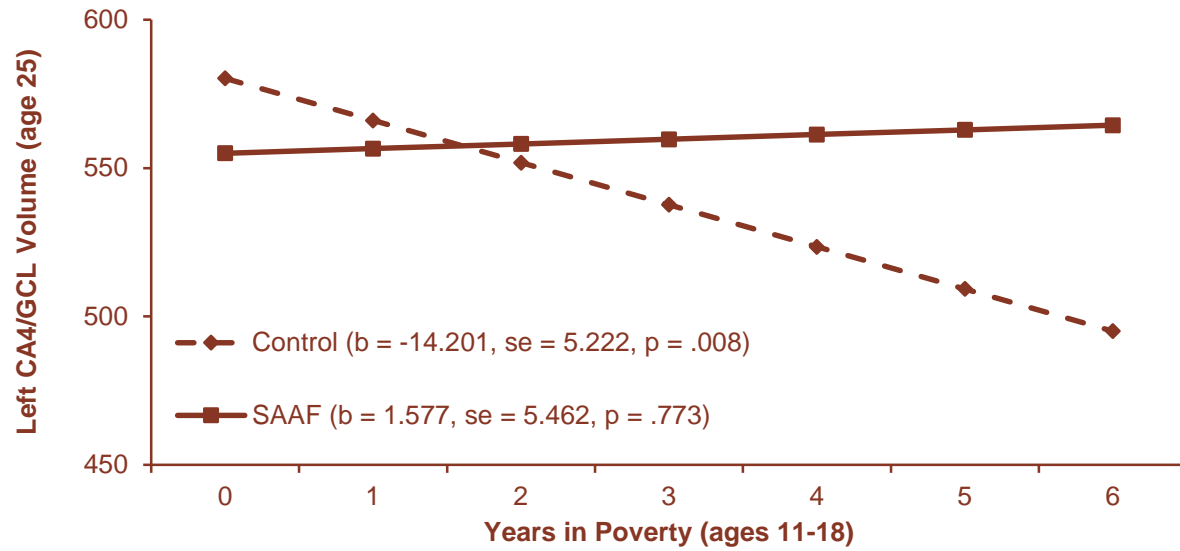
# NEW EXPLORATIONS OF FAMILY-CENTERED PREVENTION AND BRAIN MATURATION

Brody, Gray, Yu, Barton, Beach, Galván, MacKillop, Windle, Chen, Miller, & Sweet. (in press). Family-centered prevention ameliorates the longitudinal association of poverty with hippocampal and amygdalar volumes in adulthood. *JAMA Pediatrics*.



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# Recent Studies at the Center for Family Research Have

- Linked contextual challenges to allostatic load and accelerated epigenetic aging for rural African Americans
- Illustrated the buffering effects of supportive family environments for allostatic load and epigenetic aging for rural African Americans
- Demonstrated that implementing programs that cultivate resilience through strengthening family relationships has a potentially important role in improving public health

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- National Institute on Drug Abuse
- National Institute on Alcohol Abuse and Alcoholism

