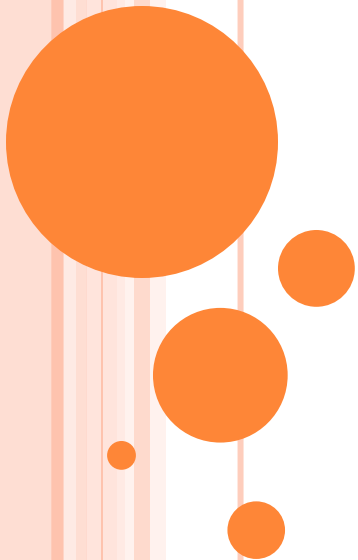


# RESILIENCE TO ADVERSITY AND THE EARLY ORIGINS OF DISEASE

Gene H. Brody  
Regents' Professor and Director  
Center for Family Research  
University of Georgia



# OVERVIEW OF TOPICS

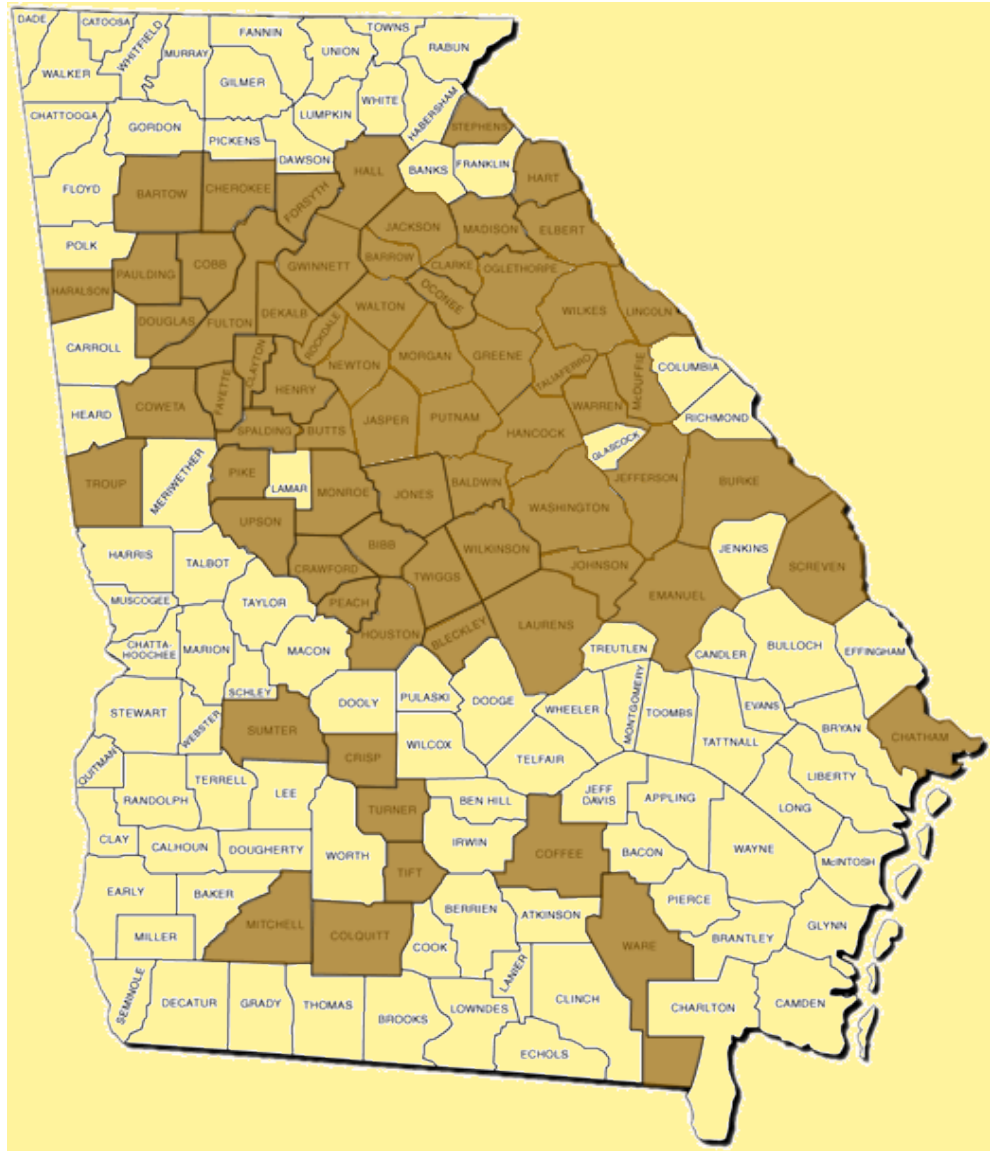
- The rural South as a developmental context for African Americans
- Testing “weathering” hypotheses with indicators of allostatic load and epigenetic aging
- A cautionary note: Is resilience “just skin deep”?
- Health benefits of family-centered prevention programs



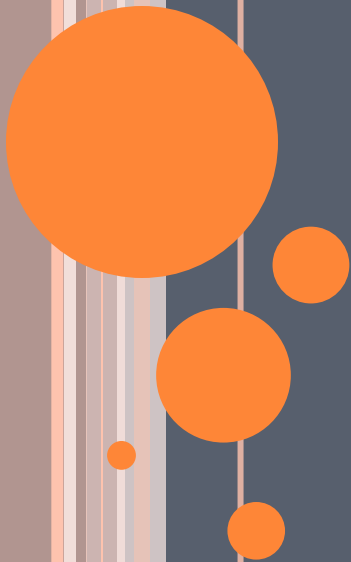
# COUNTIES COMPRISING THE SOUTHEASTERN “BLACK BELT”



# WHERE WE CONDUCT RESEARCH



# TESTING THE WEATHERING HYPOTHESIS



# ALLOSTATIC LOAD

- 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

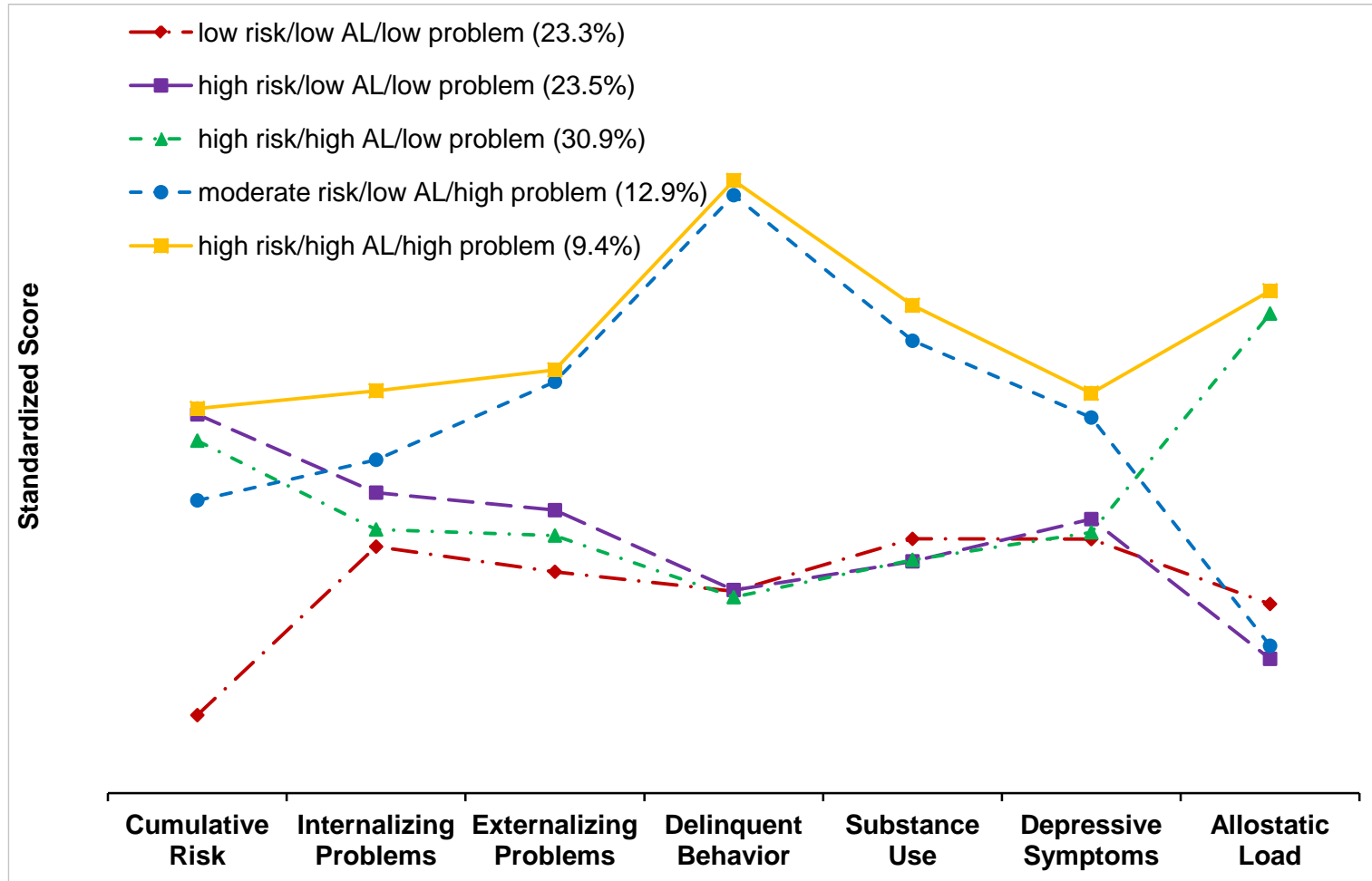


# EPIGENETIC AGING

- 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)
      - aggregated normalized methylation values from 353 CpG sites
    - Hannum's clock (2013)
      - 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

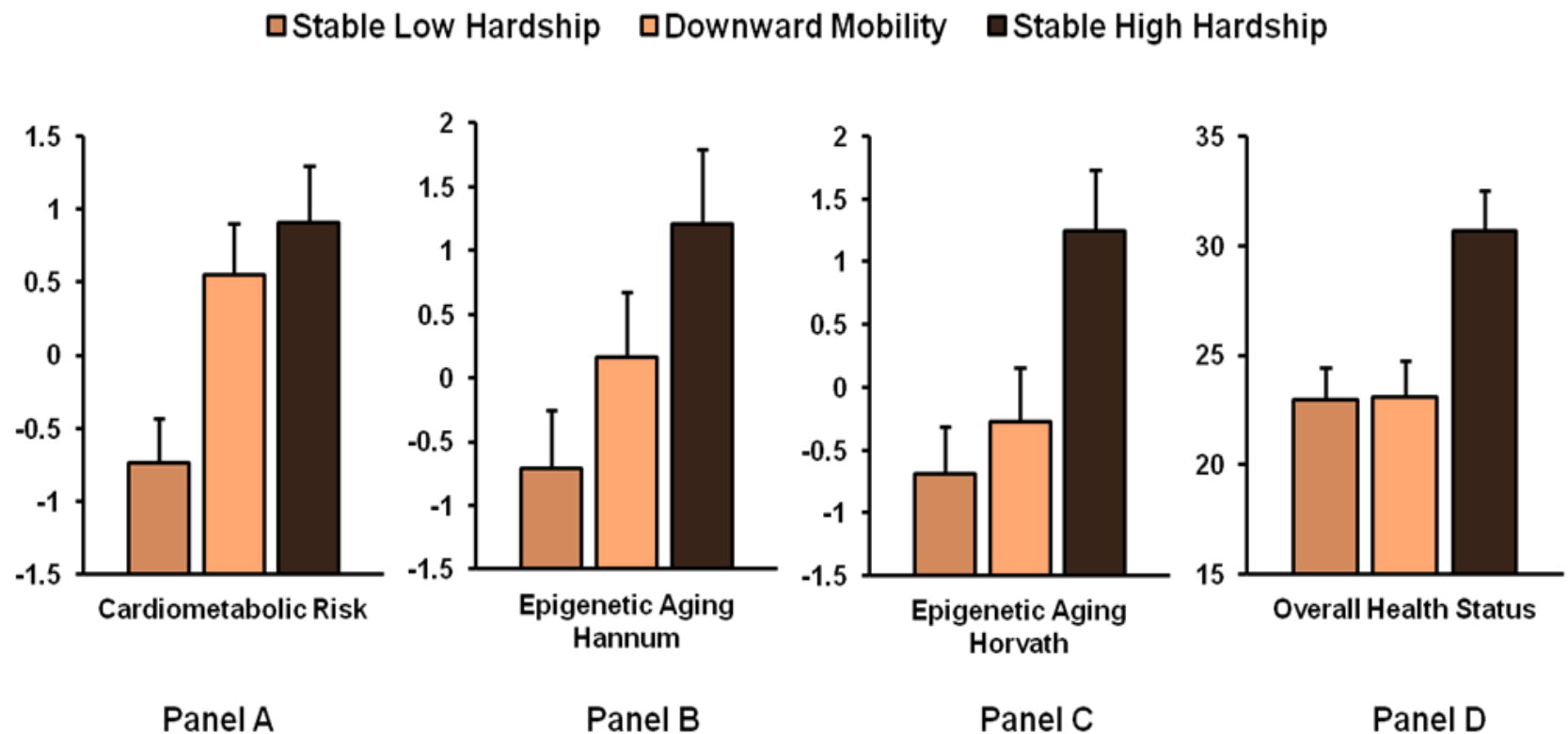


Brody, Yu, Chen, Kogan, Evans, Beach, Windle, Simons, Gerrard, Gibbons, & Philibert. (2013). *Developmental Psychology*, 49(5), 913-927. doi:10.1037/a0028847



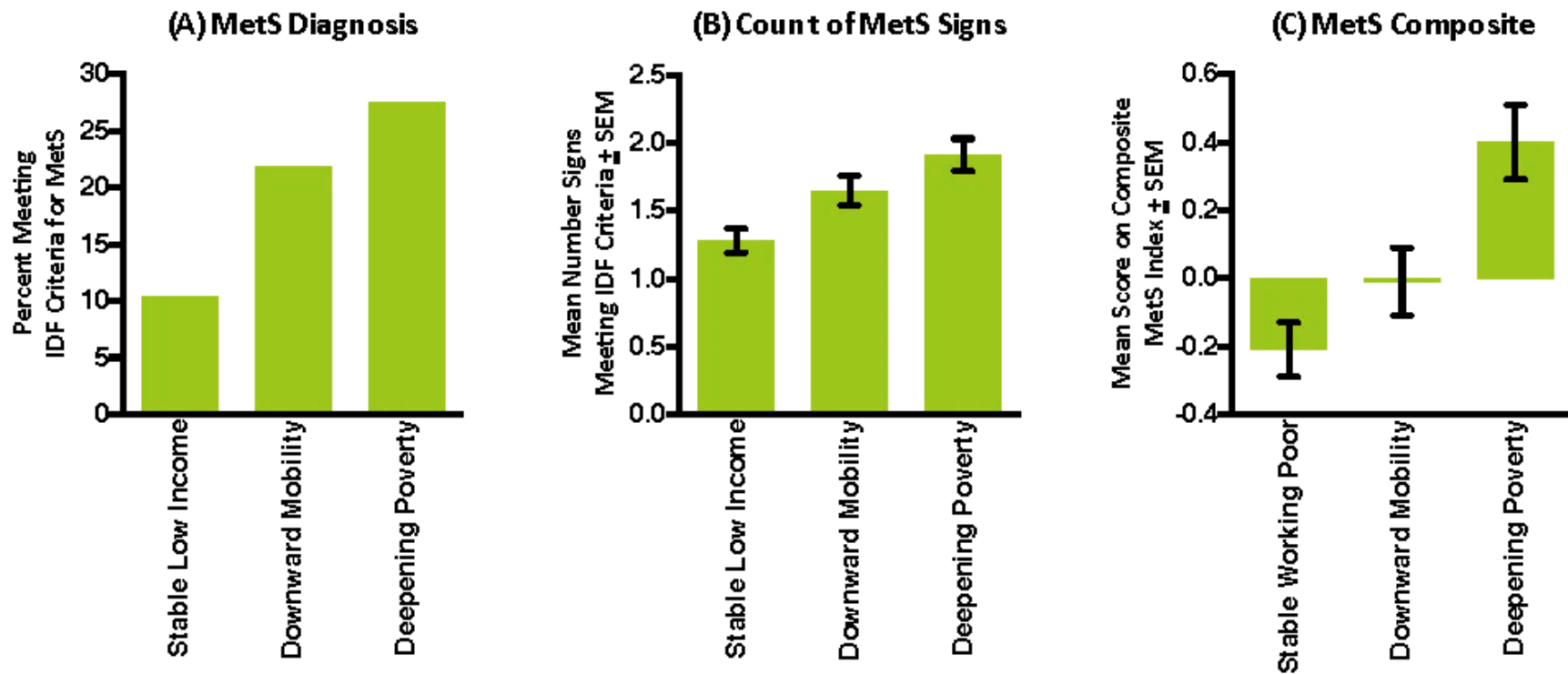


# THE GREAT RECESSION AND HEALTH RISKS FOR AFRICAN AMERICAN YOUTHS: A NATURAL EXPERIMENT



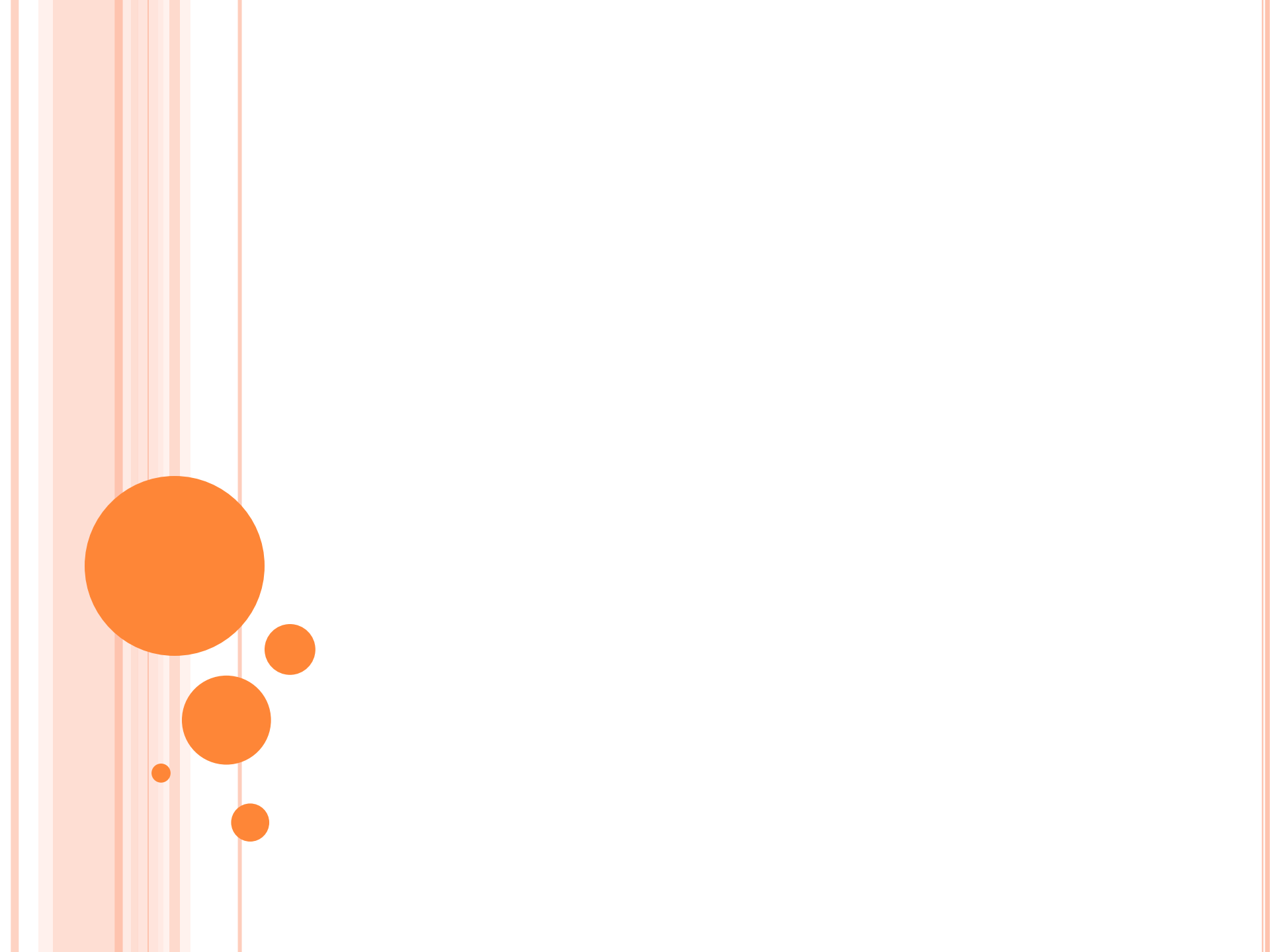
Chen, E., Miller, G. E., Yu, T., & Brody, G. H. (2016). The Great Recession and health risks in African American youth. *Brain, Behavior, and Immunity*, 53, 234-241. doi:10.1016/j.bbi.2015.12.015



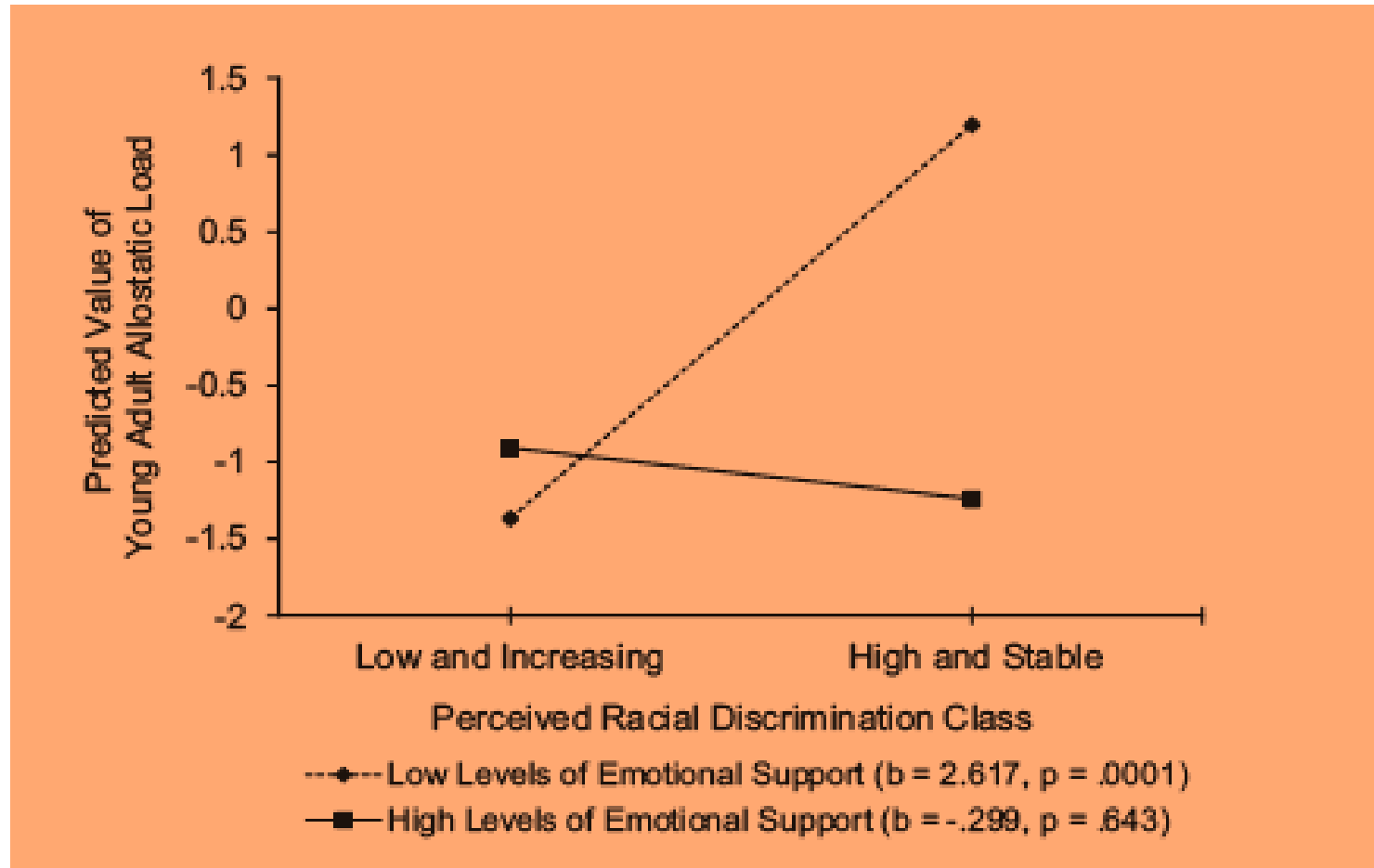


Miller, Chen, Yu, & Brody. (in press). Metabolic syndrome risks following the Great Recession in rural African American young adults. *Journal of the American Heart Association*.





# DISCRIMINATION, ALLOSTATIC LOAD, AND BUFFERING

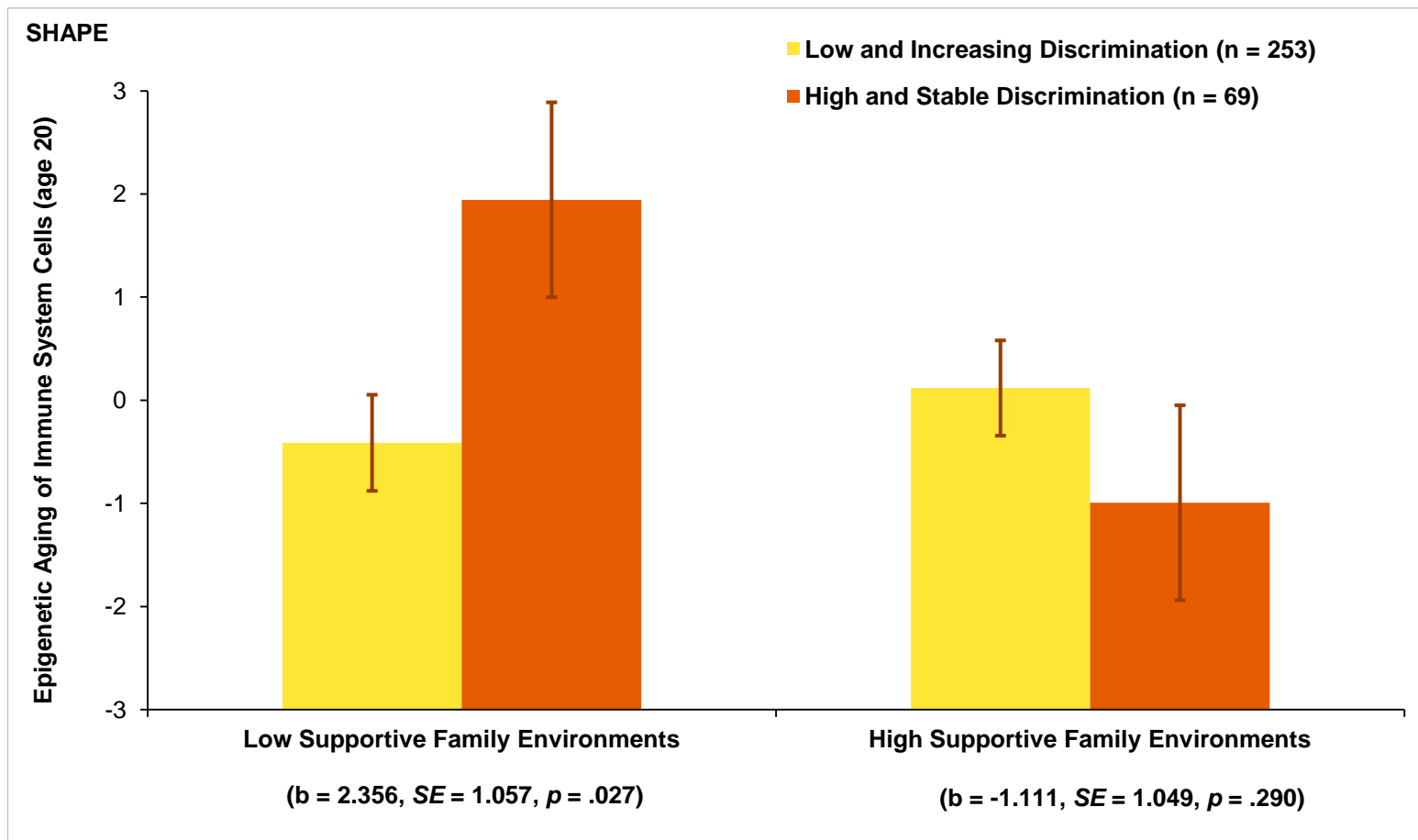


Brody, Lei, Chae, Yu, Kogan, & Beach. (2014). *Child Development*, 85(3), 989-1002. doi:10.1111/cdev.12213



# DISCRIMINATION AND ACCELERATED AGING: A REPLICATION ACROSS TWO LONGITUDINAL STUDIES

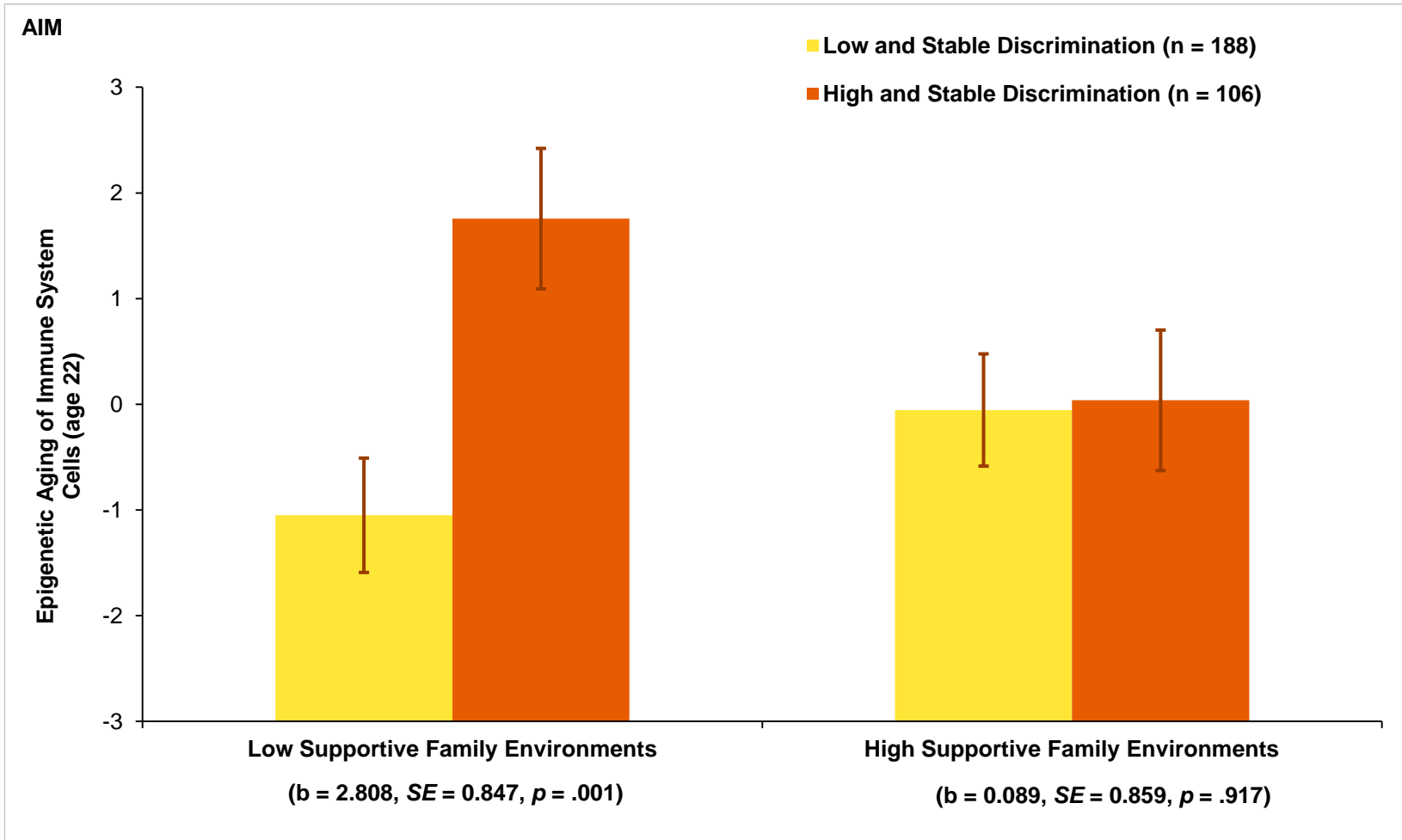
## STUDY 1: SHAPE



Brody, Miller, Yu, Beach, & Chen. (2016). Supportive family environments ameliorate...  
*Psychological Science*, 27(4), 530-541. doi:10.1177/0956797615626703



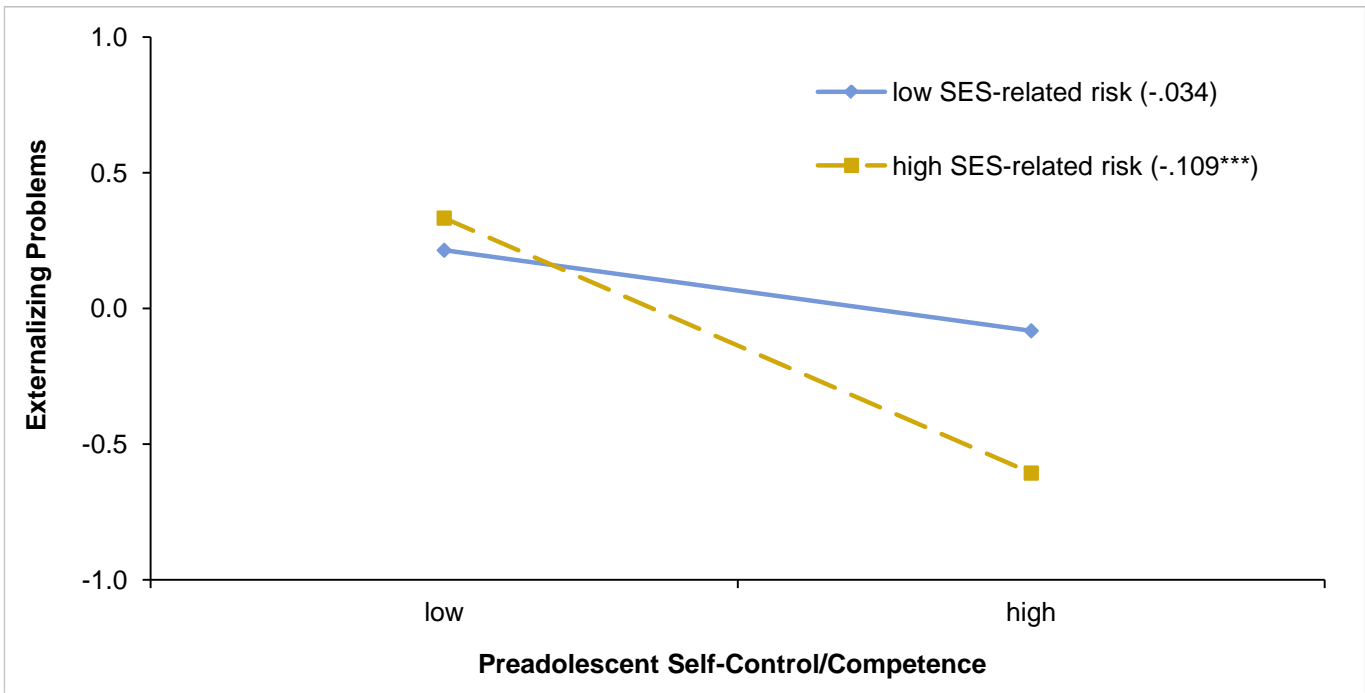
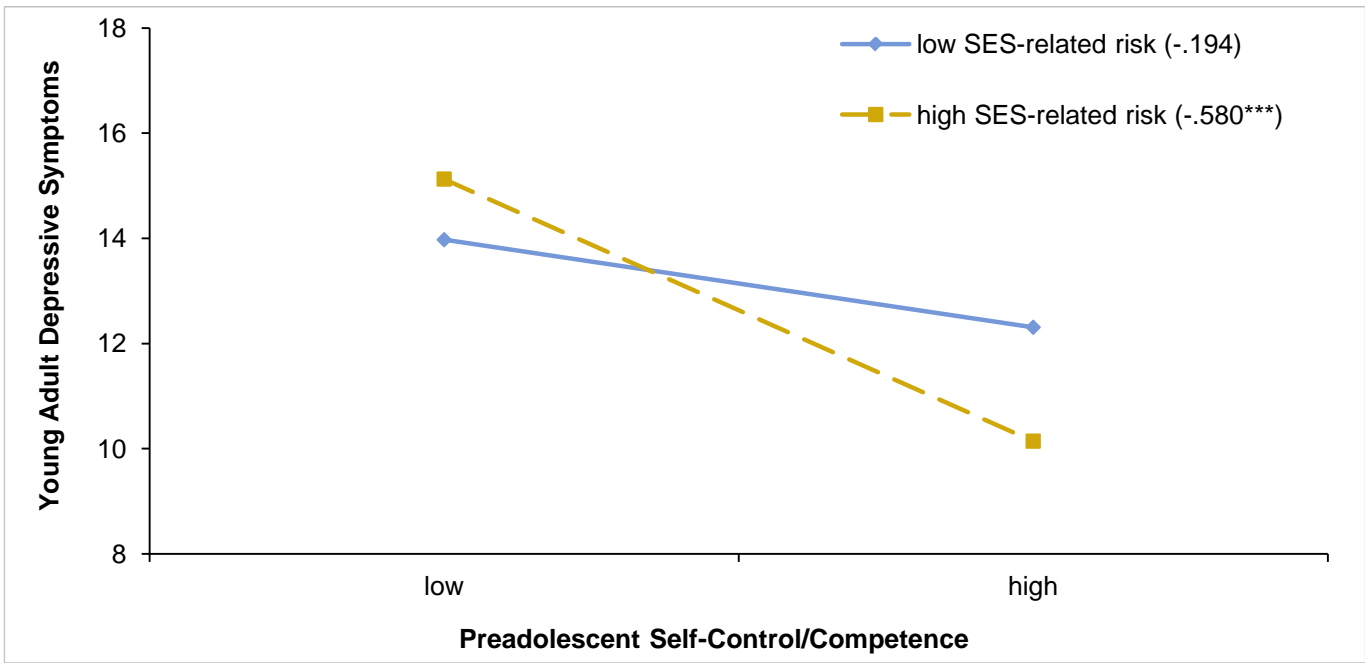
# STUDY 2: AIM



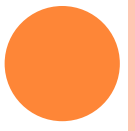
# IS RESILIENCE ONLY SKIN DEEP? A CAUTIONARY NOTE

- 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

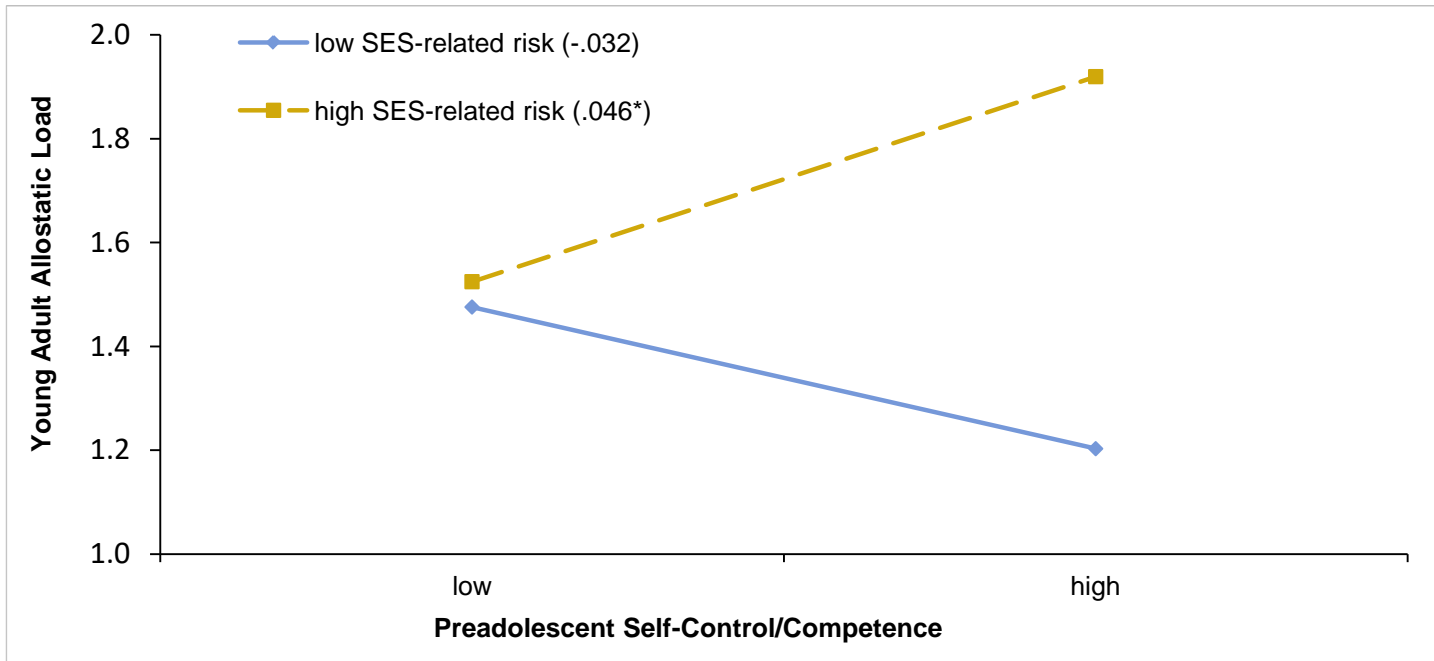


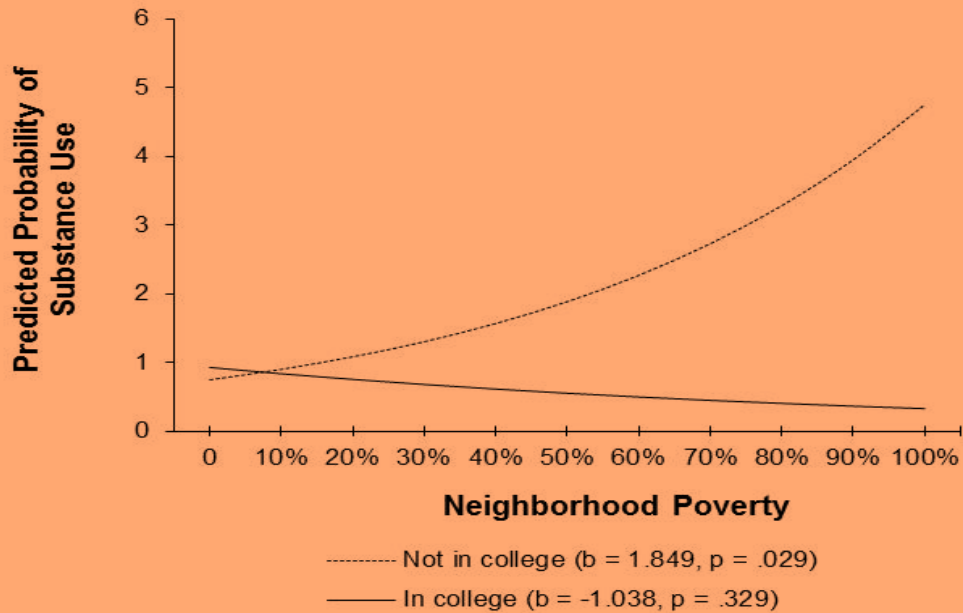


Brody, Yu, Chen, Miller, & Kogan. (2013). Is resilience only skin deep?.... *Psychological Science*, 24(7), 1285-1293. doi:10.1177/0956797612471954

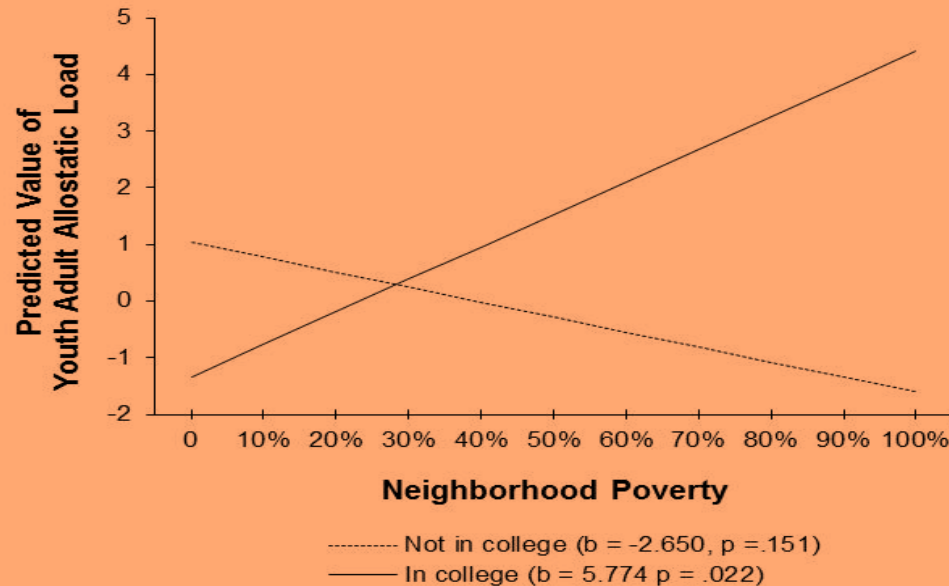




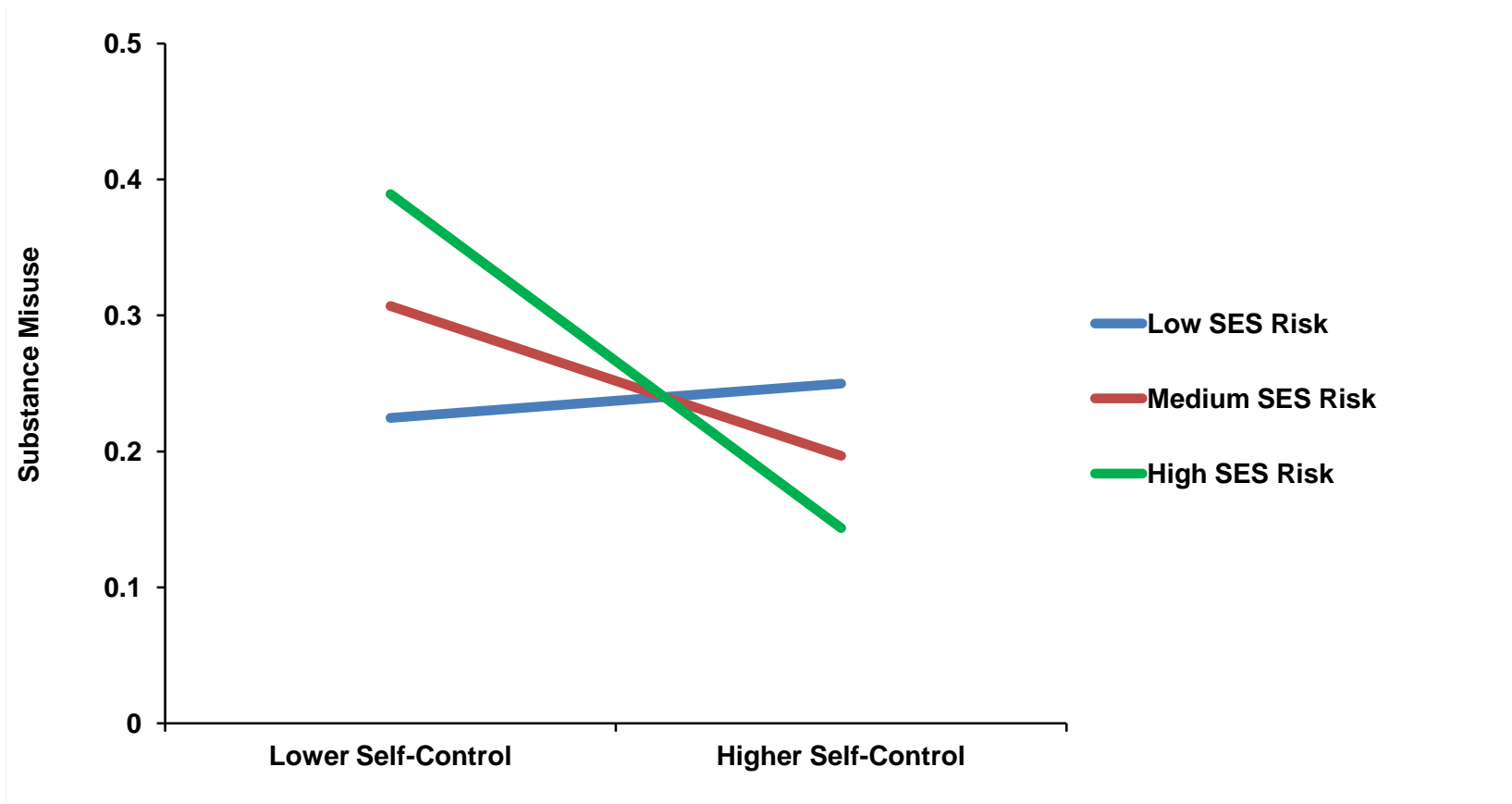




Chen, Miller, Brody, & Lei. (2015).  
 Neighborhood poverty, college attendance, and diverging profiles....  
*Clinical Psychological Science*, 3(5), 675-685.  
 doi:10.1177/2167702614546639

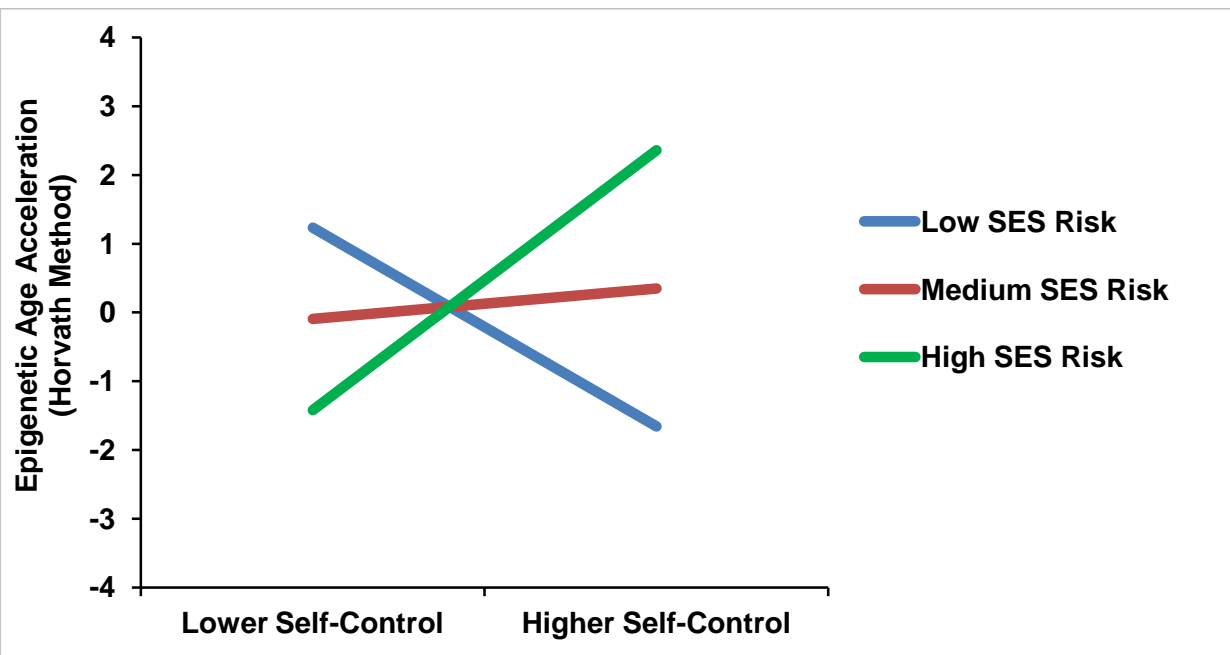
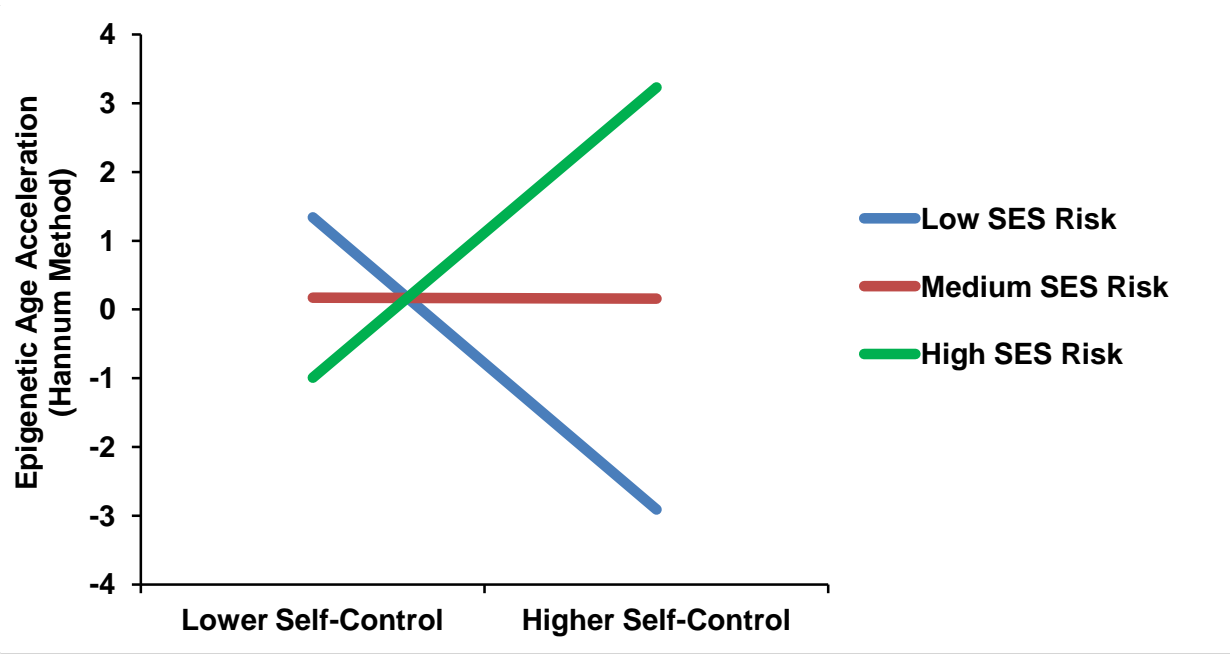


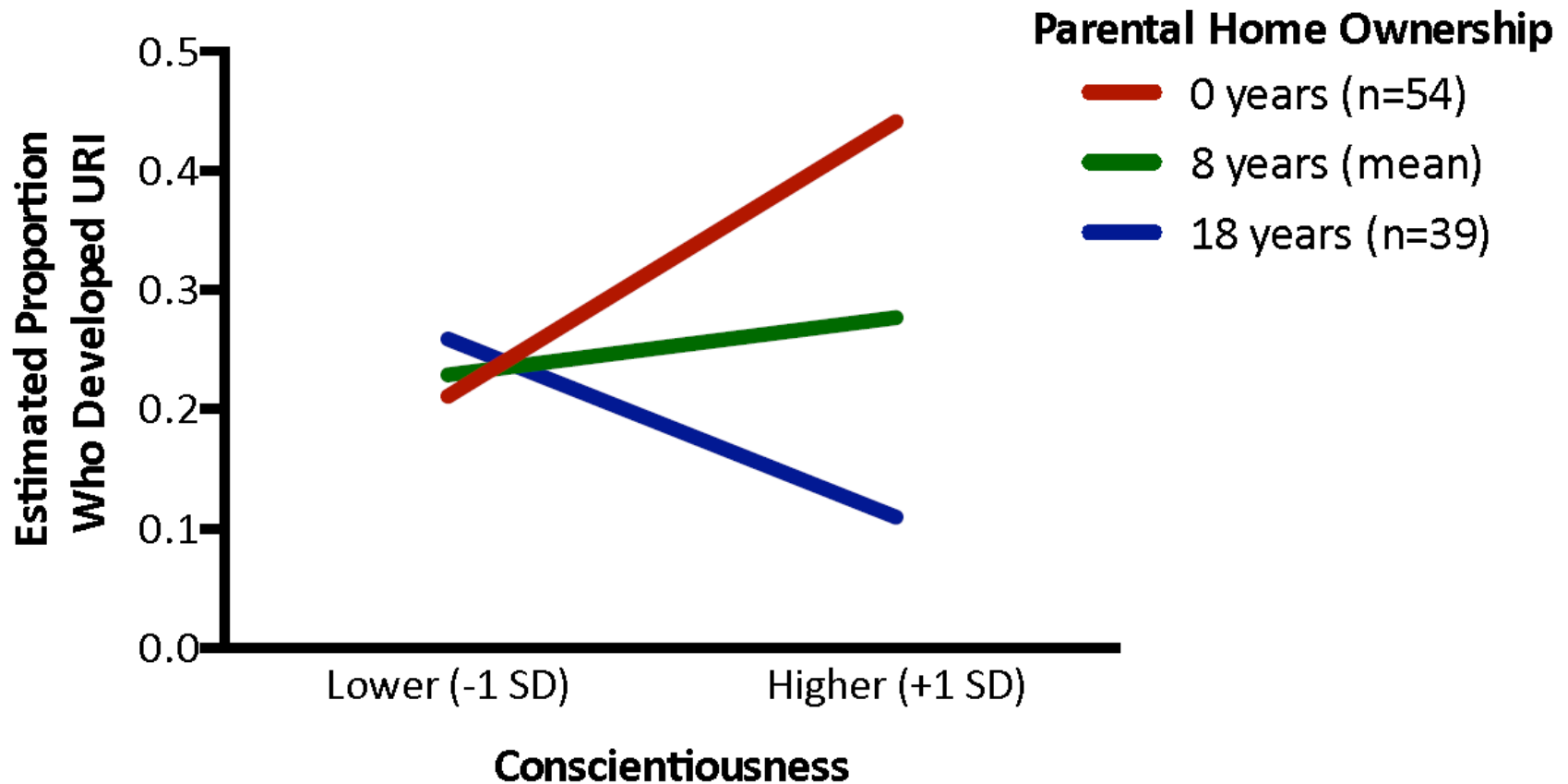
# SKIN-DEEP RESILIENCE: SELF-CONTROL FORECASTS BETTER PSYCHOSOCIAL OUTCOMES BUT FOSTERS EPIGENETIC AGING



Miller, Yu, Chen, & Brody. (2015). Self control forecasts better psychosocial outcomes but fosters epigenetic aging in low-SES youth. *PNAS*, 112(33), 10325-10330.  
doi:10.1073/pnas.1505063112



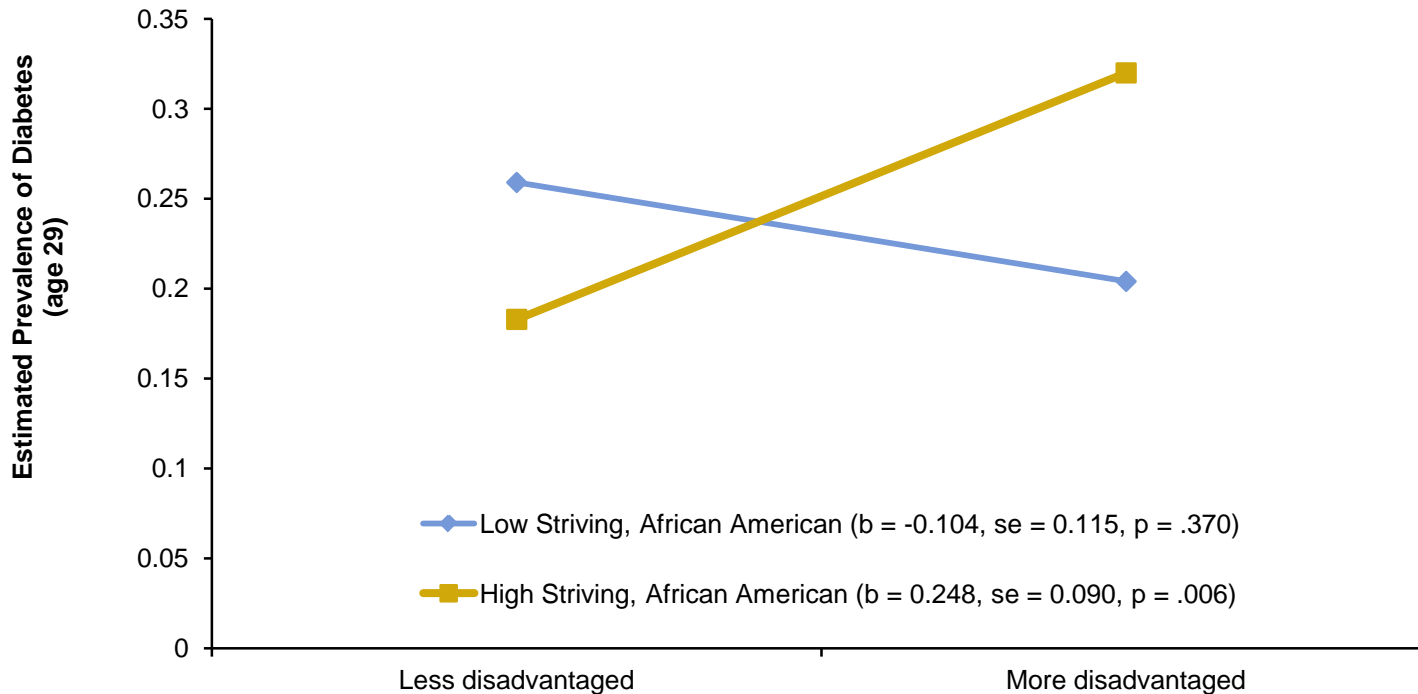




Miller, Cohen, Janicki-Deverts, Brody, & Chen. (2016). Viral challenge reveals further evidence of skin-deep resilience in African Americans from disadvantaged backgrounds. *Health Psychology, 35*(11), 1225-1234. doi:10.1037/hea0000398



# DOES THE SKIN-DEEP RESILIENCE PATTERN PREDICT CHRONIC DISEASE?



Brody, Yu, Chen, & Miller. (2016). Resilience in adolescence, health, and psychosocial outcomes. *Pediatrics*, 138(6):e20161042. doi:10.1542/peds.2016-1042



**The New York Times**

**Opinionator**

*Exclusive Online Commentary From The Times*

January 4, 2014

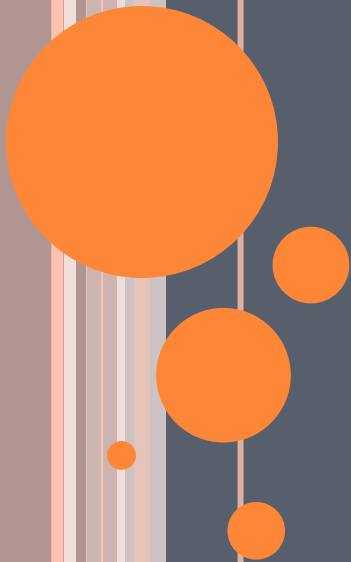
## **Can Upward Mobility Cost You Your Health?**

*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>



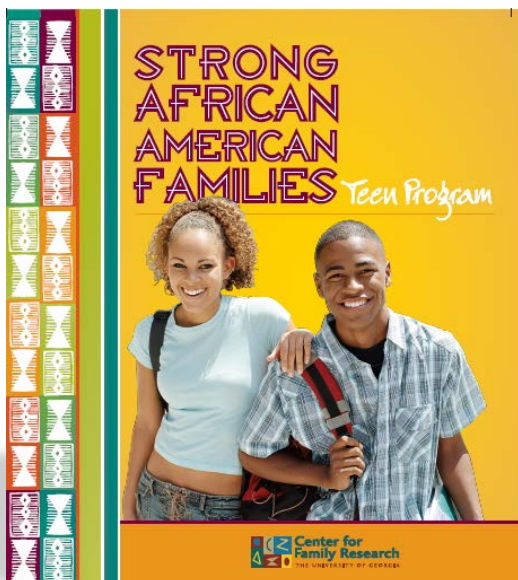
# FAMILY-CENTERED PREVENTION EFFECTS ON HEALTH OUTCOMES



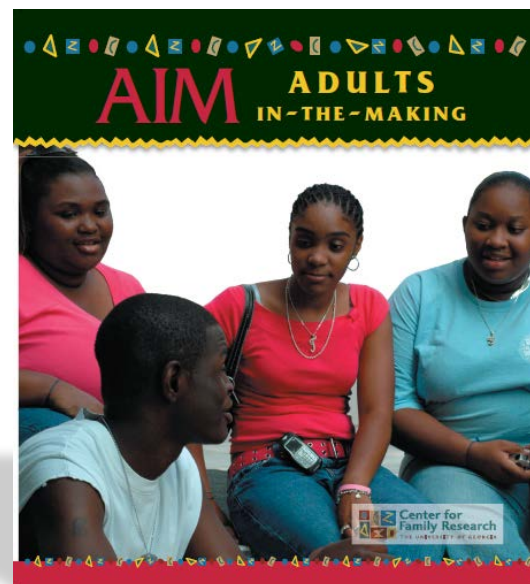




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\*Brody et al. (2004). *Child Development*, 75(3), 900-917. doi:10.1111/j.1467-8624.2004.00713.x

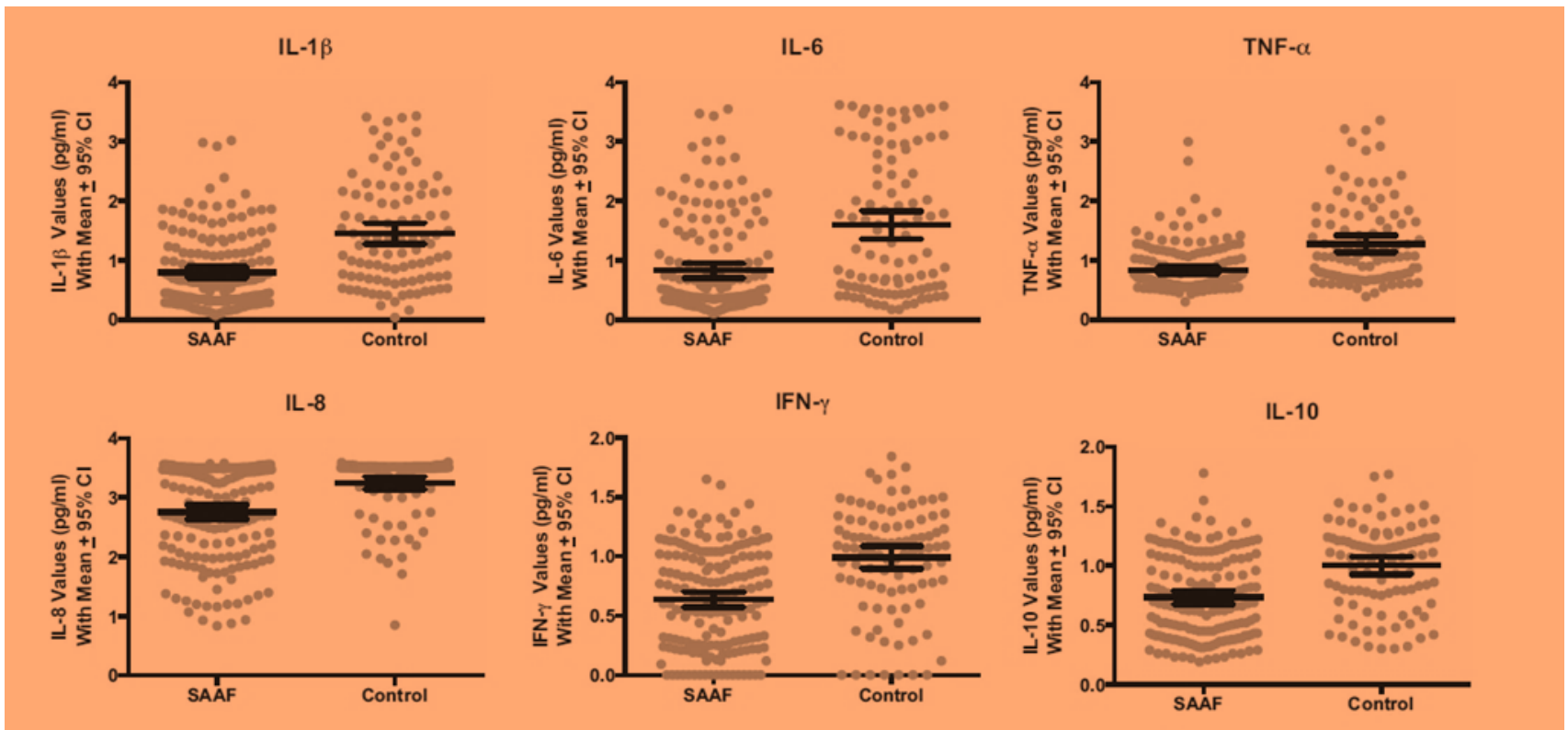
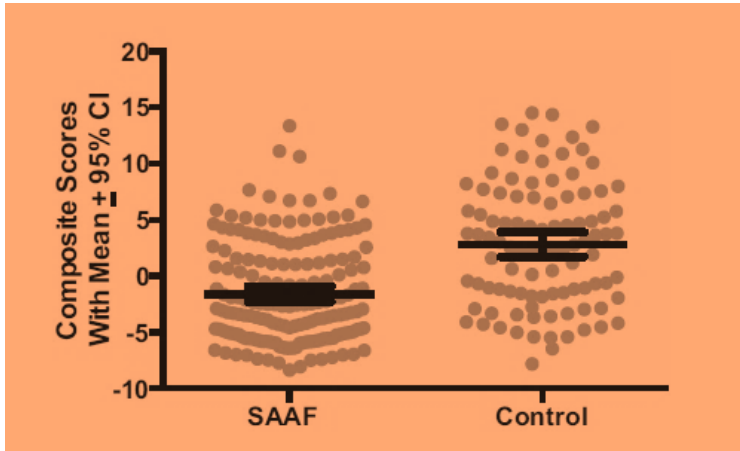
\*\*Brody et al. (2012). *Pediatrics*, 129(1), 108-115. doi:10.1542/peds.2011-0623

\*\*\*Brody et al. (2012). *Journal of Consulting and Clinical Psychology*, 80(1), 17-28. doi:10.1037/a0026592



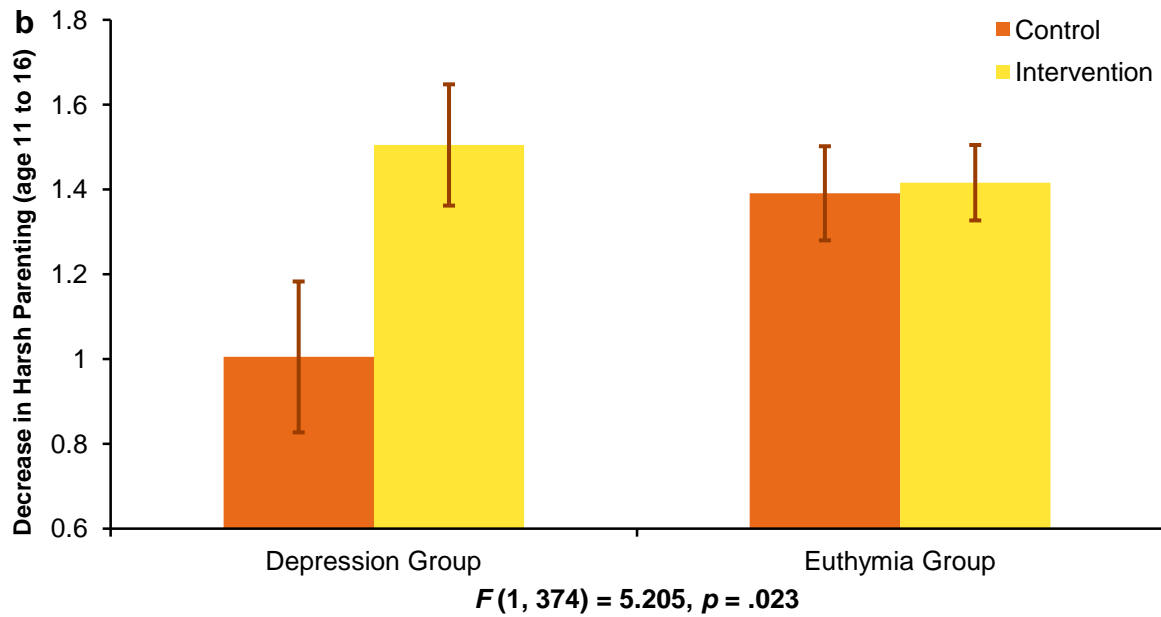
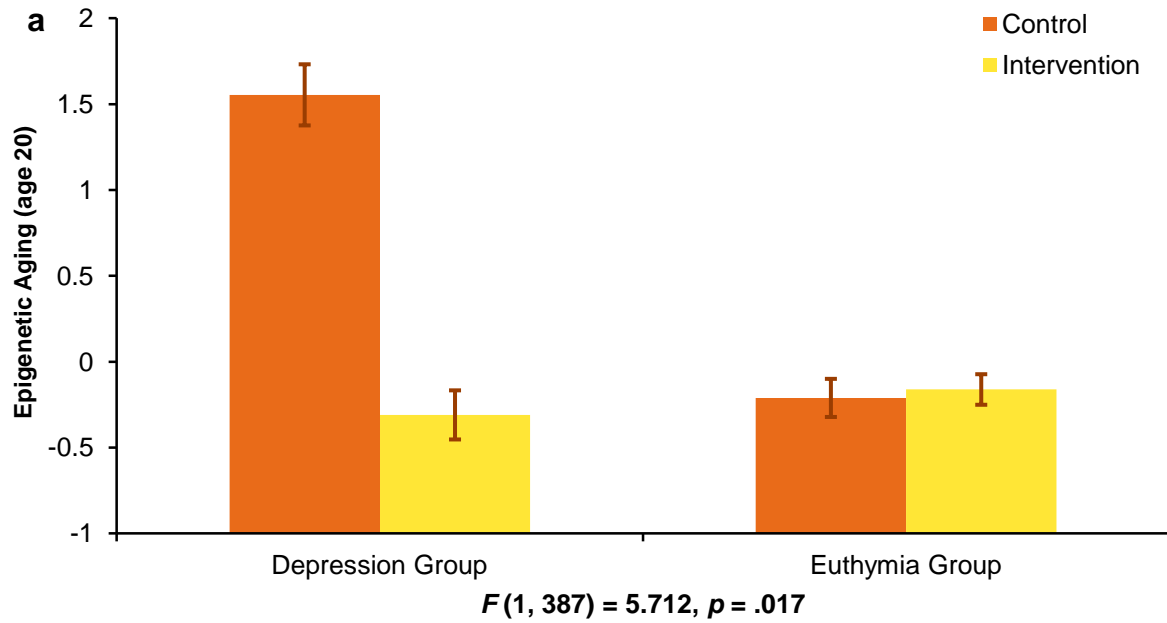
# SAAF EFFECTS ON CYTOKINE LEVELS AT AGE 19

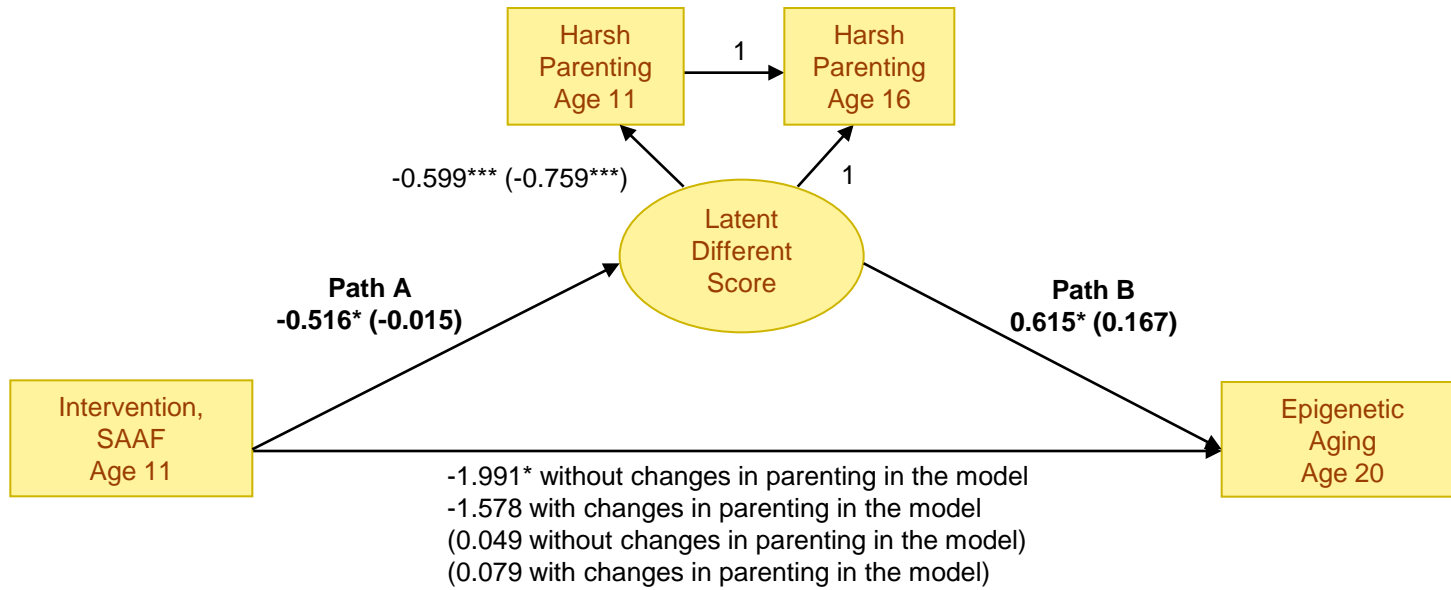
Miller, Brody, Yu, & Chen. (2014). A family-oriented psychosocial intervention reduces inflammation in low-SES African American youth. *PNAS*, *111*(31), 11287-11292. doi:10.1073/pnas.1406578111



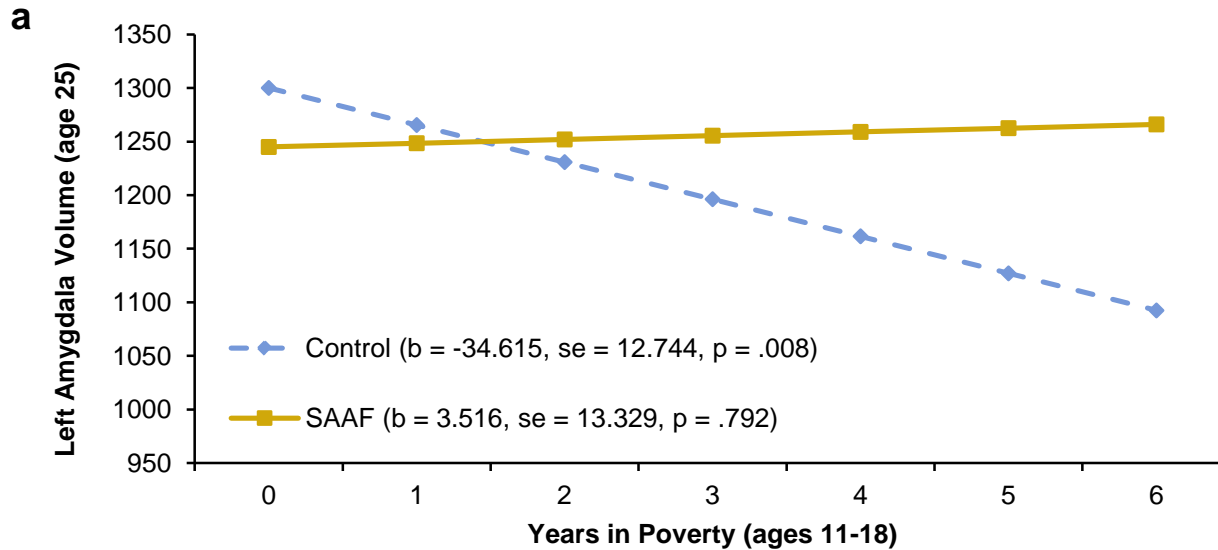
# PREVENTION REDUCES EPIGENETIC AGING AMONG OFFSPRING OF PARENTS WITH DEPRESSION

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(5), 566-574. doi:10.1111/jcpp.12495



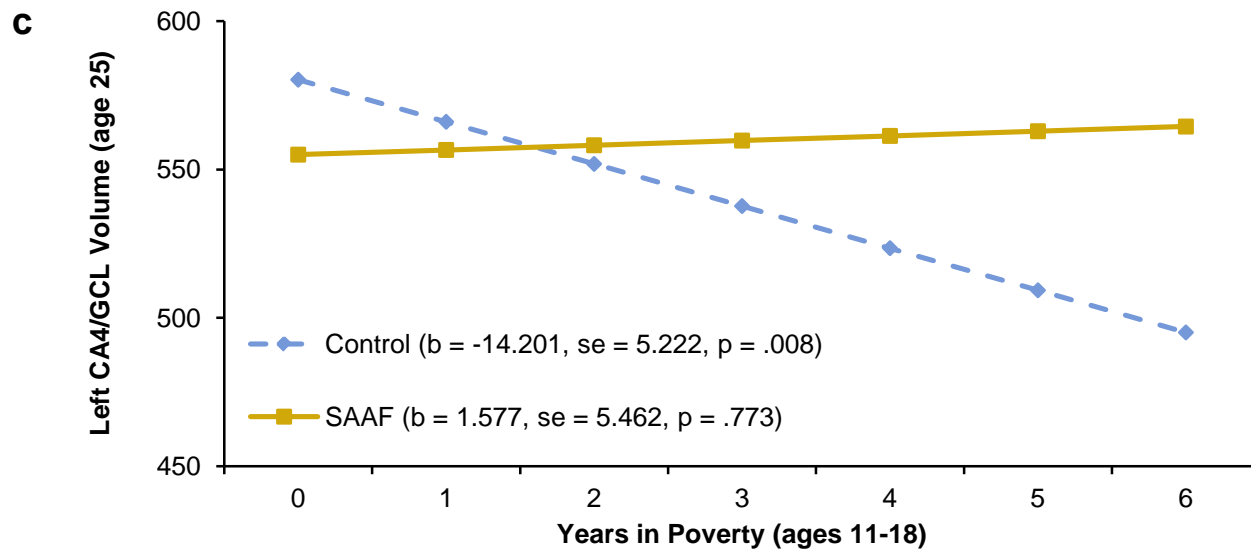
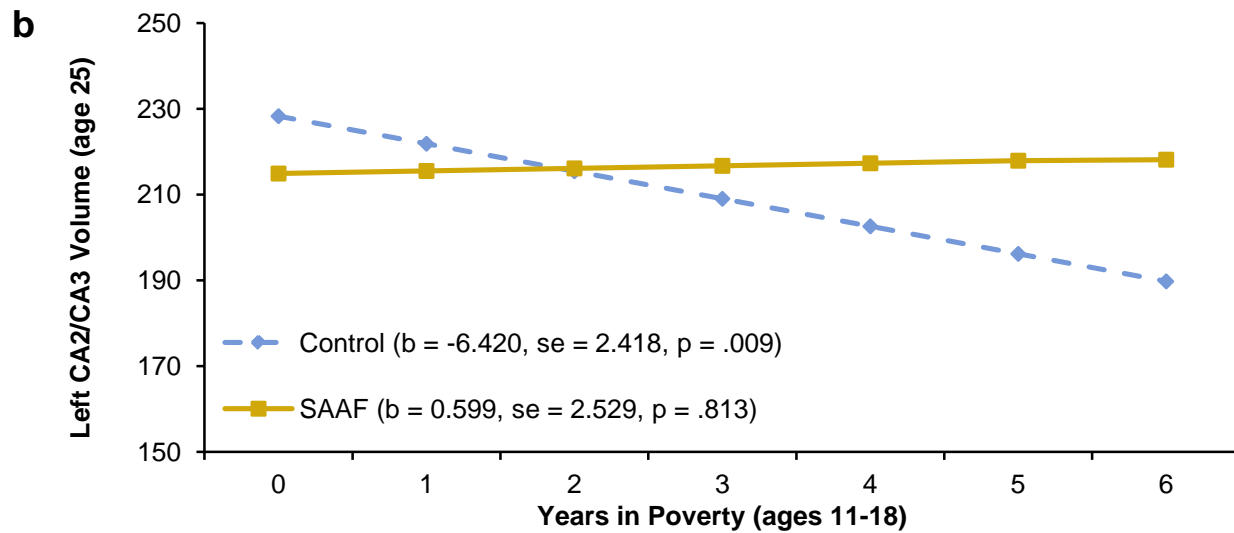


# SAAF AND NEURODEVELOPMENT



Brody, Gray, Yu, Barton, Beach, Galván, MacKillop, Windle, Chen, Miller, & Sweet. (2017). Protective prevention effects on the association of poverty with brain development. *JAMA Pediatrics*, 171(1), 46-52. doi:10.1001/jamapediatrics.2016.2988





# 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



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Center for Family Research, University of Georgia



