Examining How Healthy Brain Aging Begins in Childhood

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Paradigm Shift in Social Gerontology

“Old age as a life phase is inherently different from earlier phases because there is a long past that must be taken into account. That long past reflects the fact that aging is a lifelong process.”


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https://www.tomhussey.com/PROJECTS/REFLECTIONS/thumbs
Paradigm Shift within Epidemiology

Ben-Shlomo, Y., Cooper, R., & Kuh, D. The last two decades of life course epidemiology and its relevance for research on ageing. *International Journal of Epidemiology*, 45(4), 973-988. doi: 10.1093/ije/dyw096
Do Inequalities from Childhood Matter for Later Life Cognitive Health?

IMAGE
(not included for mass distribution)
Inequality among Families Today

8 states have top-to-bottom ratios over the national gap of 26.3

The top-to-bottom ratio measures the difference in the incomes of the top 1 percent versus the bottom 99 percent

Source: EPI

Goal 1: Prevent and Effectively Treat Alzheimer's Disease and Related Dementias by 2025

Research continues to expand our understanding of the causes of, treatments for, and prevention of AD/ADRD. Goal 1 seeks to develop effective prevention and treatment modalities by 2025. Ongoing research and clinical inquiry can inform our ability to delay onset of AD/ADRD, minimize its symptoms, and delay its progression. Under this goal, HHS will prioritize and accelerate the pace of scientific research and ensure that as evidence-based solutions are identified and quickly translated, put into practice, and brought to scale so that individuals with AD/ADRD can benefit from increases in scientific knowledge. HHS will identify interim milestones and set ambitious deadlines for achieving these milestones in order to meet this goal.

In 2016/2017, Goal 1 showed substantial progress across a spectrum of research areas, thanks to the continued support from our national leadership and the American public, the dedication of study volunteers and their families and caregivers, and the valued work of clinicians and scientists.

Federal funding devoted to AD/ADRD research has expanded over the past several years, reflecting intensified national interest in finding ways to treat these devastating diseases. The National Institutes of Health (NIH) played a lead role by redirecting $50 million in funding in fiscal year (FY) 2012 and allocating $40 million in FY 2013 to promising avenues of AD/ADRD research. Federal appropriations increases to the NIH budget by $100 million in FY 2014 and $25 million in FY 2015, primarily directed toward AD/ADRD research, were also approved. However, the biggest increases in funding came in FY 2016 and FY 2017, following Congressional passage of the Consolidated Appropriations Act 2016 (P.L. 114-113) and the Consolidated Appropriations Act, 2017 (P.L. 115-31). The FY 2016 appropriations directed an unprecedented additional $350 million toward AD/ADRD research, with an additional $400 million provided for this research in FY 2017; increasing overall NIH funding from Congress for AD/ADRD research by $912 million from FY 2012 to FY 2017. In FY 2017 alone, NIH estimates spending $1.4 billion on AD/ADRD research. This enormous infusion of resources enabled the launch and expansion of research programs and invigorated investigator-initiated research, further accelerating progress towards the Plan’s ultimate research goal: finding effective interventions to treat or prevent AD/ADRD by 2025. [See https://www.congress.gov/115/bills/hr244/BILLS-115hr244enr.pdf.]

NIH was already poised to integrate the extraordinary new funds into its research portfolio. In July 2015, NIH released the first of what is now an annual professional judgment budget for Congress -- and the American people -- estimating the costs of accomplishing the research goals of the National Plan to Address Alzheimer’s Disease. This report is known as a “bypass budget” because of its direct transmission to the President and subsequently to Congress without modification through the normal federal budget process. The most recent estimate, submitted in July 2017, outlines funding needs for the most promising research approaches for FY 2019. [See https://www.nia.nih.gov/about/sustaining-momentum-nih-takes-aim-alzheimers-disease-related-dementias.]
Advancing the Empirical Evidence, while Contributing to Theory

Childhood Socioeconomic Status and Later Life Cognition: Evidence From Wisconsin Longitudinal Study

Emily A. Green and Sara M. Moorman

Abstract

Objectives: This study examined the effects of childhood socioeconomic status (SES) on later life cognition. The Wisconsin Longitudinal Study provides a unique opportunity to investigate the long-term effects of childhood SES on educational attainment, memory, and language years. Results: Greater childhood SES predicted better language and memory abilities in later life, even after accounting for parental income and educational attainment. We found no significant effects of childhood SES on executive function. Discussion: Findings suggest that childhood SES may have lasting effects on cognitive functioning, particularly in domains such as language and memory.

Highlights

- Higher childhood SES predicted better language/executive function in older adulthood.
- APOE e4 carrier status was unrelated to language/executive function.
- For memory, APOE e4 carriers had differential susceptibility to childhood SES.
- Differential susceptibility dissipated with age.

The e4 allele of the APOE gene is associated with poorer cognition in later life. This study aimed to advance understanding of how environments potentially moderate this genetic risk by focusing on childhood socioeconomic status (SES). Previous research across diverse national contexts has found that older adults from higher-SES families in childhood demonstrate better cognitive functioning than their lower-SES counterparts. Nevertheless,
WLS Sample

IMAGE
(not included for mass distribution)
A Unique Data Source

• The Measures
  – Neurocognitive assessments
    • Age 65 and 72
    • Memory and language/executive functioning
  – Prospective measures from adolescence
  – Careful attention to status attainment of parents and the participant
  – Genetic data

• The Sample
  – White, high school graduates from Wisconsin
  – Yet still diverse in important ways (e.g., rural versus urban)
Summary of Findings (So Far)

- SES associated with baseline levels of cognition at age 65, not so much with change

- Larger associations for language/executive functioning than memory

- Associations involving parental education larger and more robust than parents’ occupational status and income

- Post-secondary educational attainment and adolescent IQ account for much of the association between parental SES and later life cognition
Summary of Findings (So Far)

- Evidence for differential susceptibility to APOE-4, specifically:
  - For memory
  - At age 65

![Graph showing memory performance over time for different groups with and without APOE-4.

*Fig. 2.* Gene-by-environment interaction of APOE ε4 carrier status and childhood socioeconomic status over a seven-year period.
Implications

• *For research*: Consistent evidence that childhood matters.

• *For theory*: Constellations of risk and protective factors stemming from childhood.

• *For society*: Forging greater connections across policy on children’s health and healthy aging.
Next Steps

• Latent transition analyses to model more subtle changes between ages 65 to 72

• School quality as another aspect of childhood inequality

• Propensity score analysis concerning long-term implications of post-secondary education
Childhood Inequality and Brain Aging among African American Adults

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Partnering for Change
Thank You!

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IMAGE
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