Socioeconomic Status (SES) Across the Life Course and Cognitive Function Among Older Adults

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Background

- Growing concern on Cognitive Impairment
  - **Decline in quality of life**
  - **High health care costs (e.g., $200 billion in 2012)**
  - **High risk of mortality (Beelen, 2009)**

- Life Course Perspective
  - **Early origins of adult health (Cohen et al., 2010)**
  - **Childhood Socioeconomic Status (SES) is associated with Cognition in later life**
    (Everson-Rose et al., 2003; Kaplan et al., 2001; Luo & Waite, 2005)

Theoretical Framework

- Latency Model
  - **Early childhood events or conditions have long-term effects on later health outcomes (Kuh et al., 2003).**
  - **Childhood SES will have direct effects on later life cognition.**
- Pathways Model
  - **Early life circumstances are connected to similar adulthood life circumstances (Graham, 2002).**
  - **Adult SES will mediate the association between childhood SES and later life cognition.**
- Accumulation Model
  - **Risk exposures are compounded over the life course (Cohen et al., 2010).**
  - **Cumulative effect of childhood and adult SES will be associated with later life cognition.**

Purpose of the Study

- The purpose of this study was to examine the relationships among childhood socioeconomic status (SES), adult SES, and cognitive status and change in cognition in later life observed over 12 years using a nationally representative longitudinal sample from the Health and Retirement Study (HRS) from 1998 to 2010.
  - **Change in global cognitive function, as well as two domains of cognition (memory and mental status) were examined.**

Research Questions

- RQ1: Is there an association between childhood SES and cognition change among older adults?
- RQ2: Does adult SES mediate the association between childhood SES and cogntive change among older adults?
- RQ3: Is there an association between cumulative SES and cognition change among older adults?

Methodology: Sample

- A nationally representative sample from 1998 to 2010 Health and Retirement Study (HRS)
- Non-institutionalized individuals aged 65 and over who are self-respondents
- N=9,407 at baseline, Total observation=42,500

Methodology: Dependent Variable

- Cognitive performance was measured by self-reported cognition survey items, including immediate free recall, delayed free recall, serial 7's, backward counting, naming the day and the date, object naming, and naming the current president and vice president of the U.S. (Ofstedal et al., 2005).
- In this study, an imputed cognition measure from the HRS was used for the analyses (Fisher et al., 2012).

- Total global cognition score (0-35) – all items
- Total memory score (0-20) – immediate free recall, delayed free recall
- Total mental status score (0-15) – remaining items

Methodology: Independent Variables

- Childhood SES factors (Luo & Waite, 2005)
  - **Father's Education**
    - 1: >= 8 years of education (reference)
    - 2: < 8 years of education
    - 3: missing
  - **Mother's Education**
  - **Father's Occupation**
    - 1: white-collar job (reference)
    - 2: blue-collar job
    - 3: missing
  - **Financial Well-being at Childhood**
    - 1: poor (reference)
    - 2: about average
    - 3: pretty well off

Methodology: Independent Variables

- Adult SES factors
  - **Respondent's Education (number of school years)**
  - **Respondent's Household Income (logged)**

- Cumulative SES Index (0-3) (Luo & Waite, 2005)
  - **Childhood SES**
    - 1: above median of the average of four items, 0: otherwise
  - **Respondent's Education**
    - 1: above college, 0: otherwise
  - **Respondent's Household Income**
    - 1: above median, 0: otherwise

- Covariates
  - **Childhood Health, Gender, Race/ethnicity, Marital status, Self-rated health, ADLs, IADLs, Depression, Chronic conditions, Smoking status, Drinking status, and Physical activity**

Methodology: Analytic Strategy

- Descriptive statistics are presented for the full sample as well as subsamples at baseline in order to provide an overview of the study samples in this study.
- Individual Growth Curve Model estimated the trajectory of cognitive performance using SAS PROC MIXED (9.3).
- Time was measured with a centered age at the sample mean (age=75).

Results: Descriptive Statistics

Variables	Total
Global Cognition	21.5(5.60)
Total Memory	8.9(3.86)
Total Mental Status	12.6(2.59)
Father's education (High)	50.2%
Father's education (Low)	34.4%
Father's education (Missing)	15.4%
Mother's education (High)	57.0%
Mother's education (Low)	30.6%
Mother's education (Missing)	12.4%
Father's job (White-collar)	20.5%
Father's job (Blue-collar)	65.7%
Father's job (Missing)	13.8%
Childhood wellbeing (poor)	34.5%
Childhood wellbeing (average)	59.6%
Childhood wellbeing (well-off)	5.9%

RQ1: Childhood SES and Cognition

Variables	Global	Memory	Mental Status
Intercept (at Age 75)	21.737***	8.480***	13.227***
Age (time)	-.186***	-.150***	-.035***
Father's educ (Low)	-.257*	-.146*	-.115*
Father's educ (Missing)	-.325*	n/s	-.175*
Mother's educ (Low)	-.781***	-.377***	-.406***
Mother's educ (Missing)	-1.388***	-.658***	-.732***
Mother's educ (Missing) * Age	-.044*	n/s	n/s
Father's job (Blue-collar)	-.990***	-.566***	-.419***
Father's job (Missing)	-.909***	-.457***	-.459***
Childhood wellbeing (average)	n/s	n/s	n/s
Childhood wellbeing (well-off)	n/s	n/s	n/s

Father's education, mother's education, and father's occupation were all significantly associated with the level of cognitive function.

RQ2: Childhood, Adult SES, and Cognition

Variables	Global	Memory	Mental Status
Intercept (at Age 75)	20.924***	8.066***	12.832***
Age (time)	-.170***	-.142***	-.027***
Father's educ (Low)	n/s	n/s	n/s
Father's educ (Missing)	n/s	n/s	n/s
Mother's educ (Low)	-.307**	-.156*	-.163**
Mother's educ (Missing)	-.667***	-.321***	-.359***
Father's job (Blue-collar)	-.289**	-.236***	n/s
Father's job (Missing)	-.318*	-.181*	-.154*
Childhood wellbeing (average)	-.432***	-.231***	-.177***
Childhood wellbeing (well-off)	-.781***	-.288*	-.459***
Respondent's education (years)	.446***	.206***	.234***
Respondent's HH Income (log)	.208***	.150***	.071***

The impact of father's education on cognitive functions was fully mediated. Also, the association between other childhood SES indicators and cognition was partially mediated by adult SES.

RQ3: Cumulative SES and Cognition

Variables	Global	Memory	Mental Status
Intercept (at Age 75)	20.244***	7.666***	12.556***
Age (time)	-.204***	-.151***	-.050***
Cumulative SES	.936***	.491***	.455***
Cumulative SES * Age	n/s	-.009*	.011***

Individuals with better cumulative SES had better cognitive functions.

Advantages in cumulative SES was associated with steeper decline in total memory scores.

Advantages in cumulative SES was associated with slower decline in total mental status scores.

Theoretical Implications

- Childhood SES had a long-term effect on the level and the rate of change in cognitive functions in later life.
- Some of the childhood effects were mediated by adult SES factors.
- Cumulative effect of SES on cognitive performance was supported.

Policy Implications

- Promoting high quality early education opportunities and programs for children from various social backgrounds
  (e.g., Head Start, Perry Preschool Project)

- Policies reducing exposure to poor residential and work environments, increasing social cohesion and social capital, increasing access to health care, and promoting positive health-related behaviors may enhance the cognitive health of low-SES families.

- Health professionals should be aware and promote preventive programs for older adults (e.g., cognitive training programs)

Study Limitations

- Proxy and institutionalized respondents were excluded from the study.
  - **There might be selection bias related to having relatively healthy individuals in the study sample.**
- Childhood measures were self-reported retrospective measures.
  - **There might be a recall bias in this measure and the accuracy of the measure is in question.**
- Due to the data limitation, several biological, psychosocial, and behavioral factors were not included in this study.
  - **ex) ApoE4, sense of control, social participation**

Conclusion

- Findings of this study support the importance of childhood SES for different cognitive function domains in later life.
- The pathways bewteen childhood SES and cognitive change may be more comprehensively understood with better measures specifically measured during the childhood.
- This study provides information for policy makers to improve intervention strategies throughout the life course for people who are vulnerable to poor cognitive performance.

THANK YOU!!!