Structural Racism and Biological Risks Factors for AD/ADRD among Young Adults in the United States

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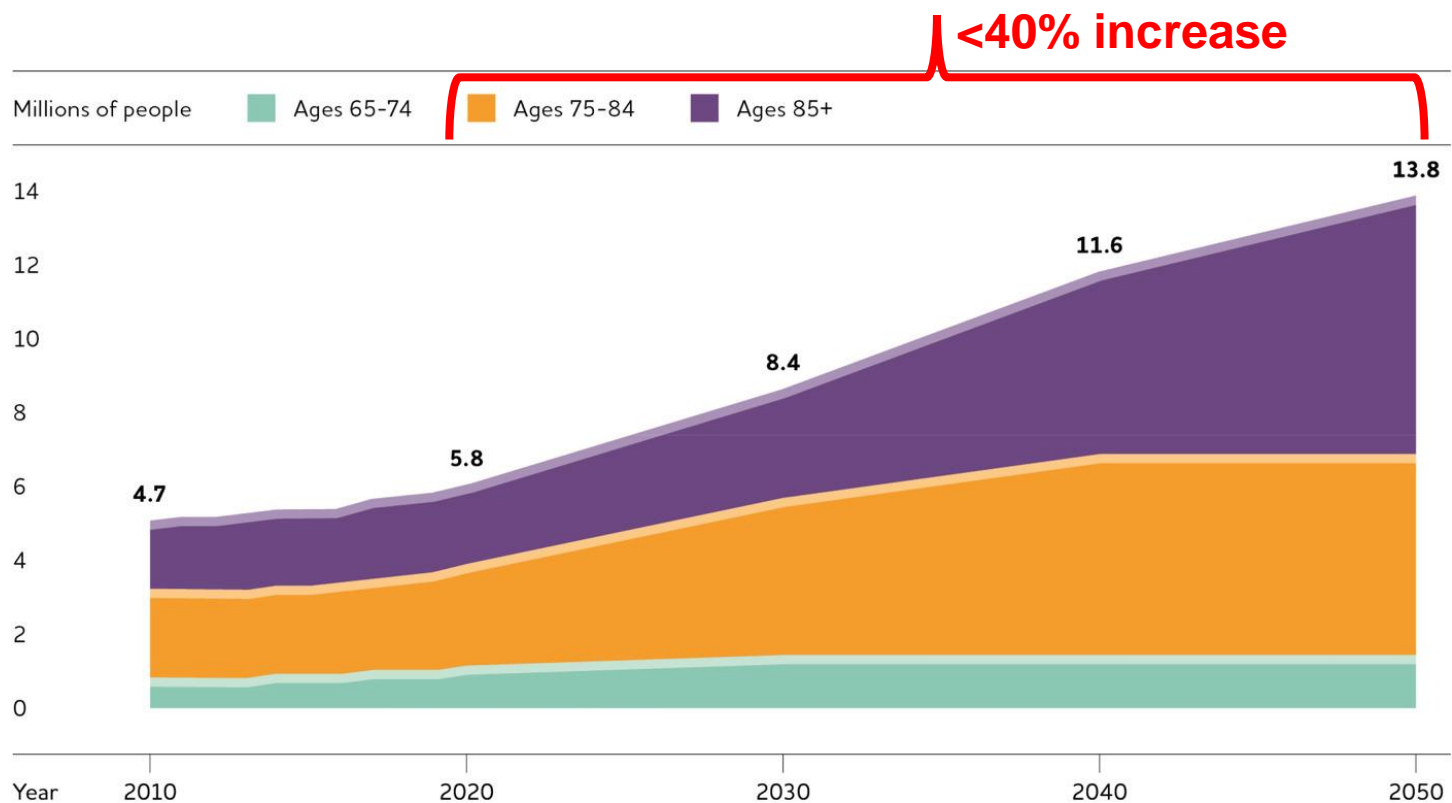
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Background

Source: Alzheimer's Association, 2023

- Prevalence and burden of Alzheimer's Disease/Alzheimer's Disease related dementias (AD/ADRD)
  - 1 in 8 older adults

- Black older adults ~2x more likely to have AD/ADRD than their white counterparts
- Critical to understand early risk factors, especially structural racism

Background

- Structural racism:
  - " '…the totality of ways in which societies foster [racial] discrimination, via **mutually reinforcing [inequitable] systems**…(eg, in housing, education, employment, earnings, benefits, credit, media, health care, criminal justice, etc) that in turn reinforce discriminatory beliefs, values, and **distribution of resources**' (Krieger 2014), reflected in history, culture, and **interconnected institutions**." (Bailey et al. 2017)

Research Questions

- To what extent do county-level measures spanning various domains of inequality in early life (e.g., adolescence) reflect a single latent factor of structural racism-related contextual (dis)advantage (SR-CDA)?

- Is SR-CDA in early life associated with various biological risk factors for AD/ADRD in young adulthood?

  - Does this relationship vary by self-identified race?

Data

- National Longitudinal Study of Adolescent to Adult Health (Add Health)
  - Nationally representative, longitudinal study of US adolescents in grades 7-12 in 1994-1995 (**Wave I; ages 12-20**)
    - Wave II: 1996; ages 12-20
    - Wave III: 2000-2001; ages 18-26
    - **Wave IV: 2008-2009**; **ages 24-32**
    - Wave V: 2016-2018; ages 33-43
  - Extensive survey, contextual, administrative, and biological data
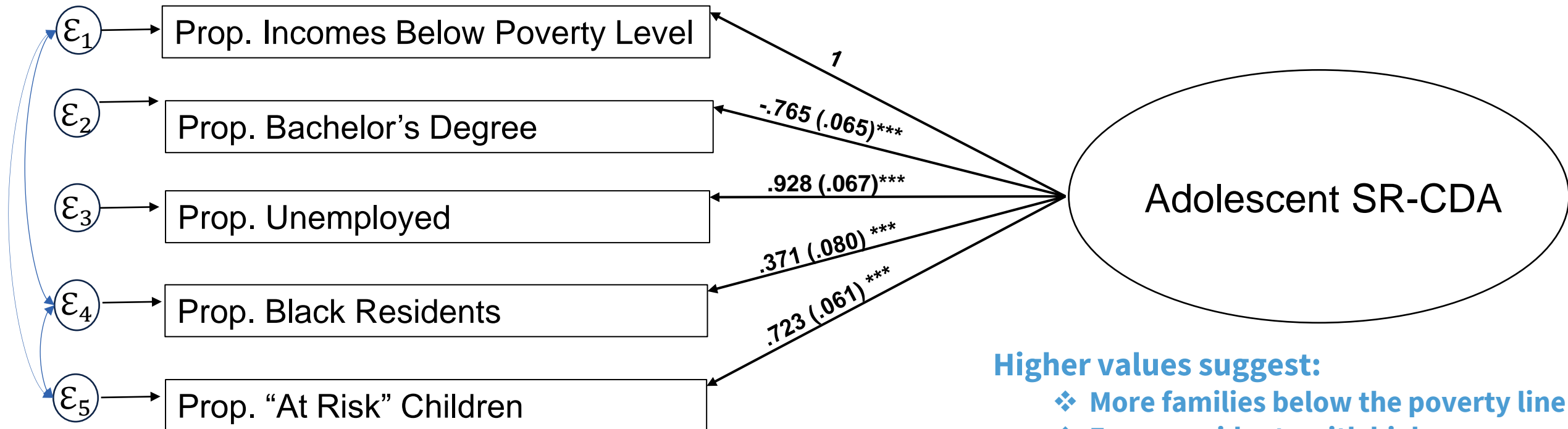
Measures

- SR-CDA at the county-level (Wave I)
  - Indicators
    - Proportion of families with income below the poverty line
    - Proportion of residents aged 25 years and older with college degree or more
    - Proportion of residents who are unemployed
    - Proportion of Black residents
    - Proportion of children who are "at risk"

- Outcomes (Wave IV)
  - Interleukin-6 (IL-6)
  - Diabetes
  - Hypertension
  - Epstein-barr virus (EBV)

Analytic Strategy

- Step 1: Confirmatory factor analysis

- Step 2: Multivariate regression analysis (weighted)
  - Independent association:
    - Health ~ SR-CDA + controls (age, sex, general health, parental SES, infections and inflammatory diseases, medication use)
  - Interaction:
    - Health ~ SR-CDA + Race + Race*SR-CDA + controls

Results

CFA Factor Loadings

ε₁ → Prop. Incomes Below Poverty Level

ε₂ → Prop. Bachelor's Degree

ε₃ → Prop. Unemployed

ε₄ → Prop. Black Residents

ε₅ → Prop. "At Risk" Children

Adolescent SR-CDA

1

-.765 (.065)***

.928 (.067)***

.371 (.080)***

.723 (.061)***

Higher values suggest:
- ❖ **More families below the poverty line**
- ❖ **Fewer residents with high educational attainment**
- ❖ **More residents who are unemployed**
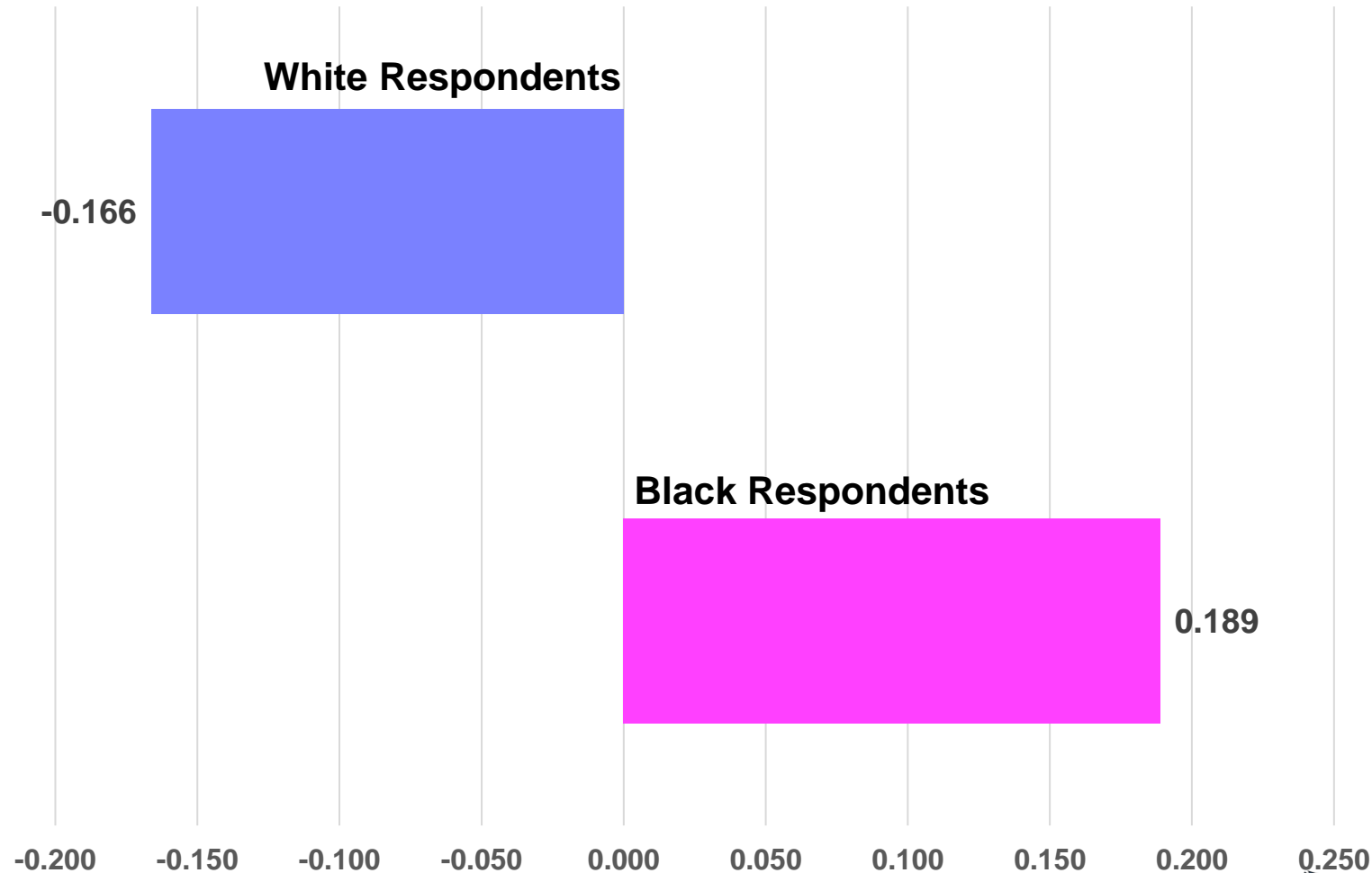- ❖ **More Black residents**
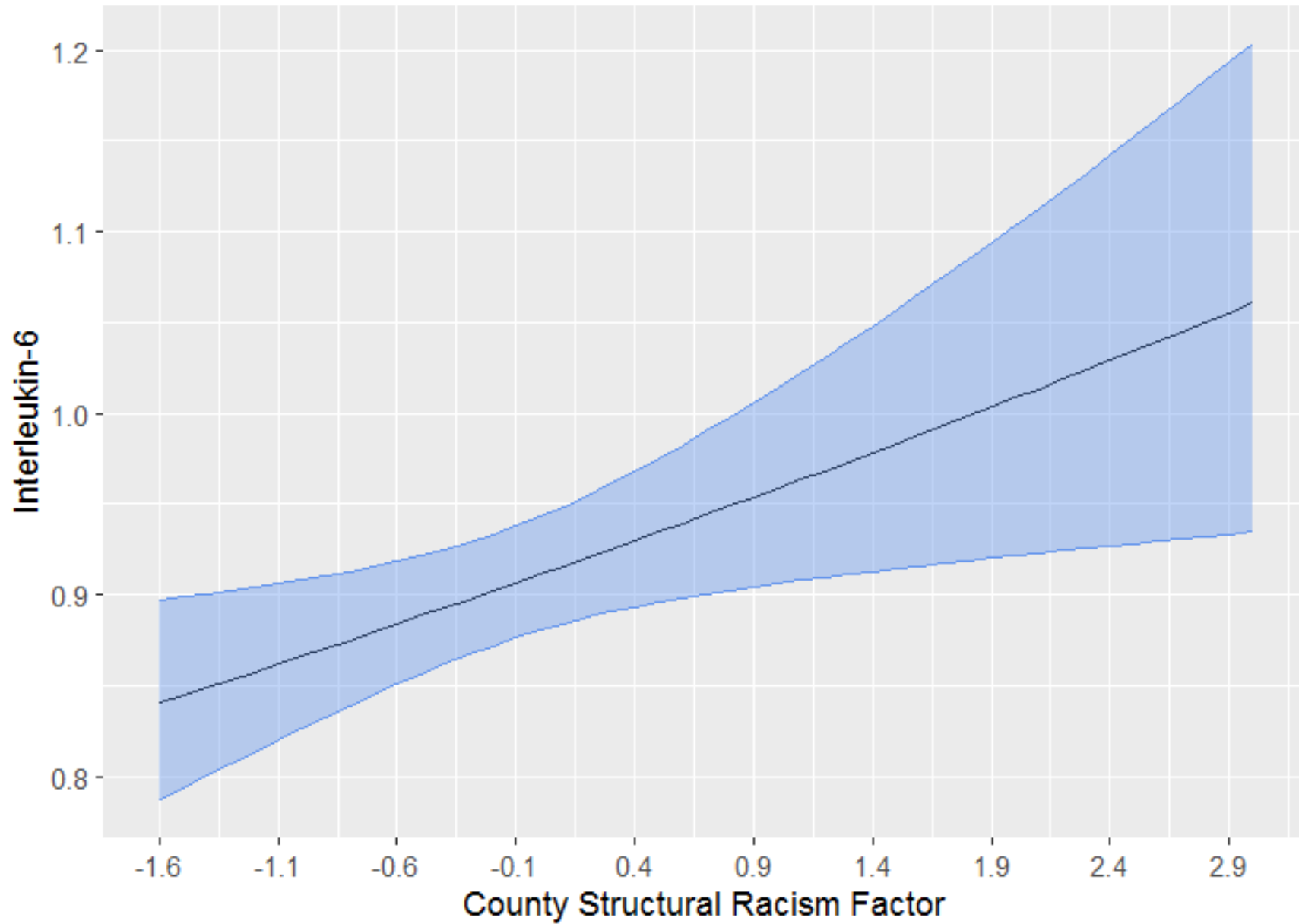- ❖ **More "at risk" children**

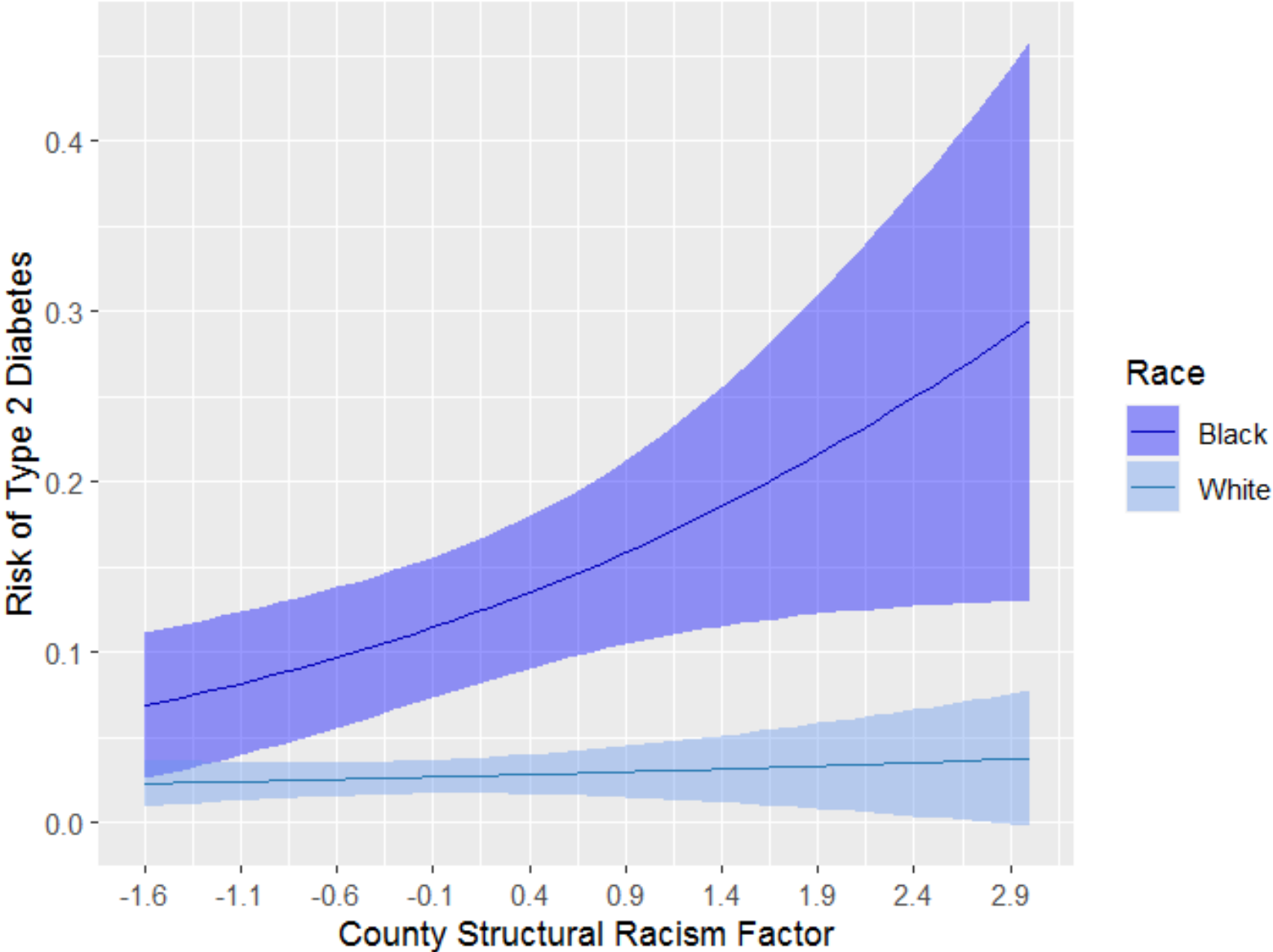Model Fit Statistics
_____
CFI: .995
TLI: .973

RMSEA: .101

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Add Health
The National Longitudinal Study of Adolescent to Adult Health

Average Factor Scores, by Race

White Respondents

-0.166

Black Respondents

0.189

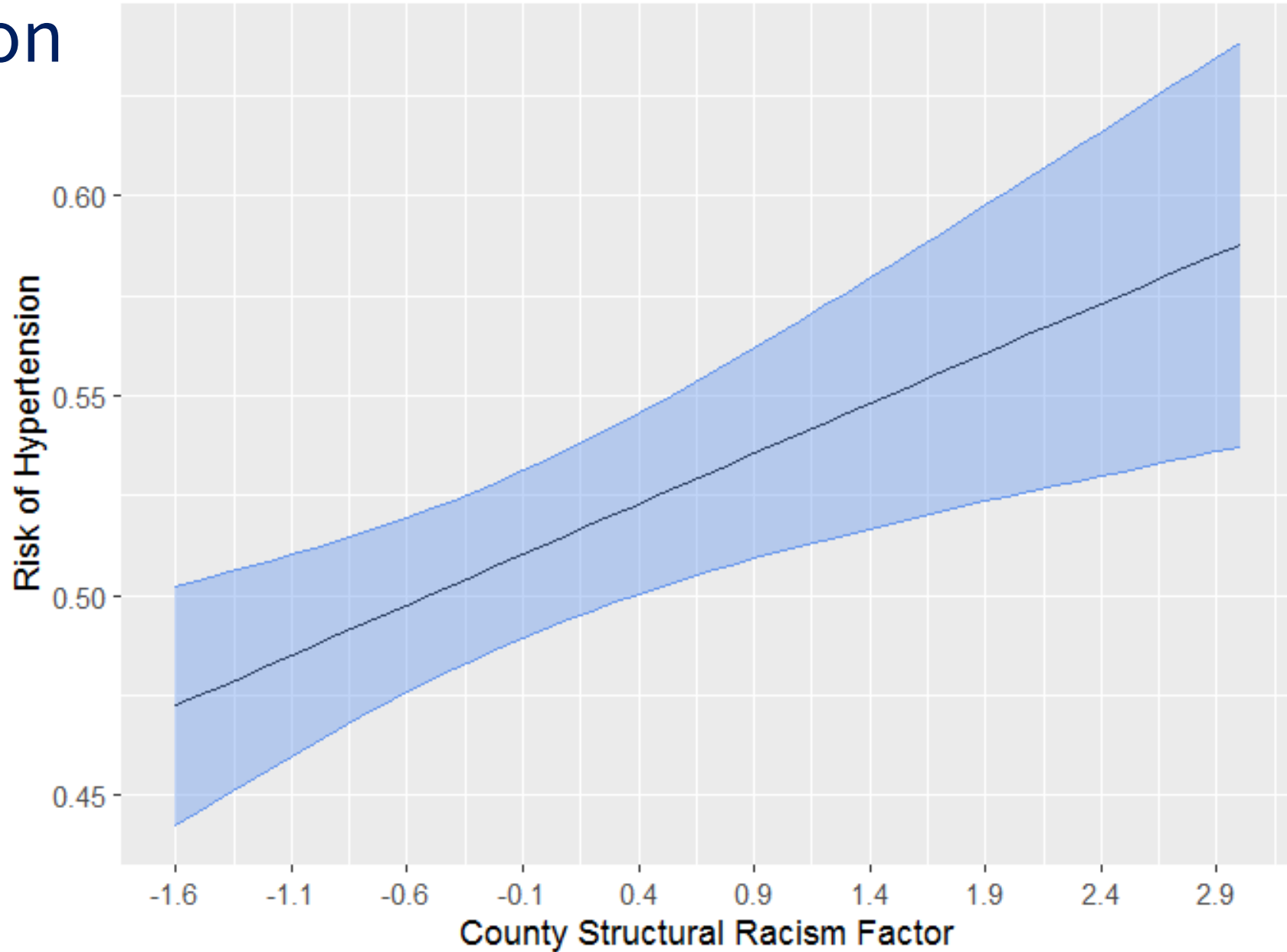-0.200 -0.150 -0.100 -0.050 0.000 0.050 0.100 0.150 0.200 0.250

Diabetes

Hypertension

No significant associations with EBV

Conclusion

- SR was associated with several biomarkers related to AD/ADRD, particularly for Black Americans

- The ways in which SR—as conceptualized here—affects health may depend on the biological system being considered

- Items used in this study to measure SR reflect specific domains (e.g., socioeconomic status, segregation)
  - Future work is needed to expand on these conceptualizations and measures of SR