Race, Childhood Structural Factors, and Cognitive Function in Later Life

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Short Abstract

We investigate how social experiences at school and community during childhood shape cognitive health over the life course with focus on racial differences. Data are drawn from the Health and Retirement Study (2006-2016) merged with information on place of residences and schools during childhood. School racial context (attending racially diverse vs. homogeneous schools) and sense of belonging to community are assessed to reflect childhood structural factors. Using growth curve models, we find that Blacks have lower levels of cognitive function than Whites in later life. The racial gap is partially explained by childhood structural factors. Attending racially diverse schools most of the time in childhood is associated with higher levels of cognitive function in later life net of adult experiences. This suggests that exposure to diverse social settings may serve as mental stimuli, promote social inclusion, and diversify social interaction, benefiting cognitive outcomes over time.

Introduction

Life course researchers have long been interested in examining whether "aging starts at birth." Considerable research has revealed the "long arm" of childhood misfortune and found that adverse childhood experiences have enduring effects on a host of older adult health conditions, irrespective of adult experiences [1–4]. Despite the contribution of previous work on early-life influences on later life health, most existing research has focused almost exclusively on the effects of childhood socioeconomic factors on older adult health [5–8]. Structural factors such as early-life school and community contexts receive less research attention, and it thus remains unclear how they contribute to later-life cognitive health.

In the current study, we investigate the extent to which social experiences at school and neighborhood during childhood shape cognitive health over the life course. We particularly focus on the potential racial differences in the trajectories of cognitive function because Black youth appear to experience different levels of social inclusion and relationships within their school and community environments compared with Whites [9]. Specifically, a sense of belonging to these environments may serve as promotive factors in early life, leading to positive cognitive and educational outcomes for Black kids [10].

However, with experiences of social exclusion or burden of "acting White," they may underperform in schools, leading to lower levels of cognitive skills and academic performance [11]. Connectedness to communities are also found to be critical for childhood development including self-efficacy and emotional satisfaction [12]. However, little empirical research has been conducted on the link between perceived community and school experiences to older adult cognitive health.

Guided by contact theory, we hypothesize that exposure to interracial school context in early life may serve as early mental stimuli and diversify social interaction and resources, resulting in positive cognitive outcomes in later life. In fact, previous work shows that individuals who attended racially diverse schools tend to perform better in high school, college, social situations, and jobs compared those who attended racially segregated schools [13–15]. However, we know little about whether school racial context has enduring health consequences over the life course. Integrating social capital theory [16, 17], we expect that greater sense of belonging to community during childhood may have positive implications for their cognitive outcomes, which has been largely overlooked in past research.

Childhood structural factors are relatively a new area of research in life course perspectives. The issue has been limited in part because it requires life course data that contain information on childhood schools and neighborhoods necessary to measure their social environments. Current longitudinal surveys of older adults do not have detailed information on childhood, while studies on childhood structural factors focus largely on outcomes of younger populations [18].

The Health and Retirement Study (HRS) provides a unique opportunity to test our hypotheses. In addition to social, demographic, and health data of older adults that have been collected every two years, the HRS has recently collected information on childhood school and community experiences. By analyzing newly available data, the current study fills the gap in the current literature. Because these immediate social environments in early ages can provide resources and protection that can benefit health over time [15]—and yet distressing, disadvantaged environments can also expose them differentially to life course risks, it is important to evaluate their long-term impacts on health in later life.

Data and Measures

To evaluate early structural factors associated with later-life cognitive health, the current study uses the 2017 Health and Retirement Study Life History Mail Survey (LHMS). In 2017, HRS conducted the LHMS that comprises a random sample of all English-and Spanish-speaking participants who were still living and in the sample in 2016. One valuable feature of these data is that they use a modified life history calendar method to enhance respondent's recall of the timing of specific events over the life course which may provide a more complete picture on early-life conditions.

To evaluate the trajectories of cognitive health among older adults, we link the six waves of HRS (2006-2016) to the 2017 HRS LHMS (N=2,119; age 50+ in 2006). We limit our analytic sample to those who participated in 2006 wave up to most current 2016 wave in part because some of the confounders were introduced first in 2006 psychosocial leave-behind. The confounders are adult experiences with discrimination (alpha=0.80) and neighborhood social cohesion (alpha=0.82).

From respondent's report on the history of childhood school and neighborhood, we construct two childhood structural factors: (1) school racial context and (2) neighborhood belonging (1 "most unlikely" and 7 "most likely"). We code school racial context to 1 if respondents reported that they mostly attended racially diverse vs. homogenous schools (=0).

Childhood SES and health are assessed as early-life controls. We create childhood cumulative adversity based on respondent's report on their perceived SES (low=1), relocation due to financial difficulty (yes=1), received financial help from relatives (yes=1), father's unemployment (yes=1), father's low education (less than high school=1) (range 0-5). Childhood health is coded 1 if respondents report that they had poor health. The HRS Imputed Total Cognitive Score is used as a measure of cognitive functioning in later life (for the cognition measurement, see [19]). Sociodemographic variables include age, gender, race, marital status and educational attainment. Health behaviors include smoking and drinking behavior status (never vs. former vs. current).

Analytic Strategy

We use growth curve models to predict how the trajectories of cognitive function are attributable to early childhood factors. We begin by adding race and demographic covariates in Model 1 to explore any potential racial differences. Then in Model 2, we add childhood school and community factors to test their long-term impacts on cognitive function and whether they contribute to racial differences in cognitive function. In Model 3 and 4, we introduce adult SES, health behaviors, and discrimination experiences and neighborhood belonging during mid- to later-life to test their explanatory power.

Preliminary Findings

About 10% of respondents attended racially diverse schools whereas most respondents attended racially homogenous schools. This accounts for racial context of all schools respondents attended, from kindergarten to high schools. Respondents reported higher sense of belonging to their childhood communities (mean=6.2). More than half of the respondents went to college (57.9%), followed by high school diploma (32.9%), middle and high schools (8.5%), and less than elementary educational attainment (0.9%). Notably, respondents who mostly attended racially diverse schools in childhood were more likely to receive higher education (college or more) than those who attended racially homogeneous schools (70% vs. 56.7%, respectively).

Most respondents were married (62.7%). About 10% were currently smokers. Respondents' report on everyday discrimination was fairly low (1.57 out of 6) while they reported high levels of belonging to their current communities (5.6 out of 7).

Using growth curve models, we find that Blacks have on average lower levels of cognitive function in later life. The racial gap decreases but remains statistically significant even after controlling for childhood structural factors, indicating that social experiences at school and community during childhood contribute to the gap in cognitive health between Blacks and Whites. Among childhood structural factors, individuals attending racially diverse schools have better cognitive function net of adult SES, health, and discrimination experiences. The racial differences remain significant though the magnitude reduces further with inclusion of adult experiences in Model 2 and 3. Figure 1 depicts the different trends of cognitive function given school racial context during childhood (from Model 4), with higher cognitive function of those attending racially diverse schools than those attending homogenous schools in later life.

Lastly, we tested the interaction term between race and school racial context (results not shown) to explore whether social identities condition different health trajectories given their previous experiences in childhood. Unlike previous work on the cognitive benefits of attending racially diverse schools among Black youth [20, 21], we did not find the moderating role of race on later-life cognition in relation to childhood school context.

Findings presented here suggest that exposure to diverse social settings may serve as mental stimuli, promote social inclusion, and diversify social interaction, benefiting cognitive outcomes over time. This underscores the importance of understanding how early-life external environments can shape social experiences during childhood and racial disparities in health over the life course.

Future Plans

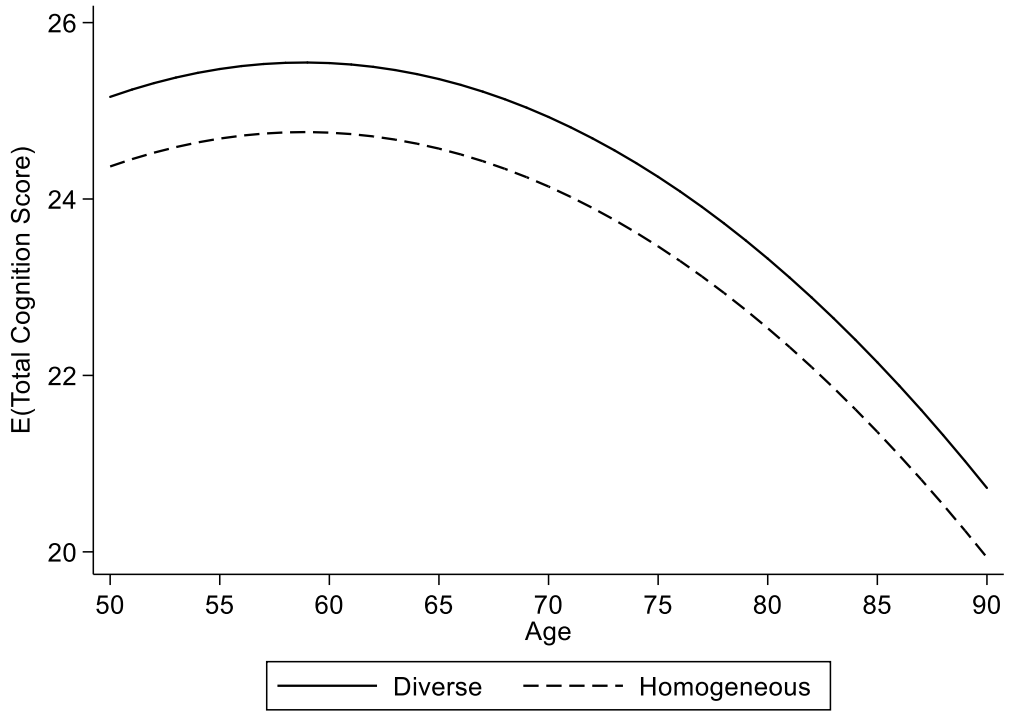
Our future plan attends to the potential cohort differences. Racial segregation was legal until 1954, which may have affected schooling experiences and residential context differently by birth cohorts. We expect that the impacts of school and community experiences may operate differently for earlier birth cohorts in the HRS (those born before 1948) than Baby Boomers. Imputed income and wealth variables will be accounted as adult SES confounders in our analytic models. To examine the threshold effect of cognitive decline, we will generate a binary variable indicative of cognitive impairment (total cognitive score <8) and will run multilevel logit models to see if early-life structural factors increase the risk of onset of cognitive impairment in later life.

Table 1. Growth curve models predicting cognitive function from childhood structural factors and adult SES, health and experiences.

	Model 1		Model 2		Model 3		Model 4	
	Race + Covariates		Model 1 + Childhood structural factors + Childhood controls		Model 2 + Adult SES + Adult health		Model 3 + Adult social experiences	
	Coeff.	Sig.	Coeff.	Sig.	Coeff.	Sig.	Coeff.	Sig.
Black	-3.39	***	-3.23	***	-2.67	***	-2.58	***
Age	-0.11	***	-0.10	***	-0.08	***	-0.08	***
Age-squared	-0.00	***	-0.00	***	-0.01	***	-0.00	***
Attending diverse schools			1.37	***	0.81	*	0.79	*
Childhood neighborhood belonging			0.16	*	0.14	*	0.11	
Childhood cumulative adversity			-0.28	***	0.03		0.02	
Childhood poor health			-0.87	*	-0.55		-0.53	

*** p<0.001; ** p<0.01; p<0.05.

Figure 1. Trajectories of cognitive function by childhood school racial context (diverse vs. homogeneous) (age 50+ in 2006; from Model 4).



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