



# “Rest of the folks are tired and weary”: The impact of historical lynchings on biological and cognitive health for older adults racialized as Black

Paris B. Adkins-Jackson<sup>a,\*</sup>, César Higgins Tejera<sup>b</sup>, Dejanía Cotton-Samuel<sup>c</sup>, Carla L. Foster<sup>d</sup>, Lauren L. Brown<sup>e</sup>, Kenjus T. Watson<sup>f</sup>, Tiffany N. Ford<sup>g</sup>, Tahlia Bragg<sup>h</sup>, Betselot B. Wondimu<sup>i</sup>, Jennifer J. Manly<sup>j</sup>

<sup>a</sup> Departments of Epidemiology and Sociomedical Sciences, Mailman School of Public Health, Columbia University, New York, NY, 10032, USA

<sup>b</sup> Department of Neurology, School of Medicine, Johns Hopkins University, USA

<sup>c</sup> Taub Institute for Research on Alzheimer's Disease and the Aging Brain, Department of Neurology, Columbia University, New York, NY, 10032, USA

<sup>d</sup> Department of Epidemiology, Mailman School of Public Health, Columbia University, New York, NY, 10032, USA

<sup>e</sup> Leonard Davis School of Gerontology, University of Southern California, Los Angeles, CA, 90089, USA

<sup>f</sup> School of Education, American University, Washington, DC, 20016, USA

<sup>g</sup> Division of Community Health Sciences, School of Public Health, University of Illinois Chicago, 1603 W. Taylor St., Chicago, IL, 60612, USA

<sup>h</sup> Department of Neurology, School of Medicine, Boston University, Boston, MA, 02118, USA

<sup>i</sup> Department of Sociomedical Sciences, Mailman School of Public Health, Columbia University, New York, NY, 10032, USA

<sup>j</sup> Department of Neurology, Vagelos College of Physicians & Surgeons, Taub Institute for Research on Alzheimer's Disease & the Aging Brain, Columbia University, New York, NY, 10032, USA

## ARTICLE INFO

Handling editor: Social Epidemiology Office

### Keywords:

Structural racism

Lynching

Cognition

Inflammation

## ABSTRACT

Childhood structural racism may lead to poorer health and longevity for individuals racialized as Black. Racism-related stress cumulatively taxes the body resulting in worsening biological and cognitive health. This study examines the association between state-level exposure to historical lynchings (adverse childhood racism for modern older adults), with C-reactive protein (CRP, a marker of systemic inflammation), and global cognitive performance (modified TICS). We linked the percentage of lynchings of people racialized as Black at the state-level between 1882 and 1968 from the Archives at Tuskegee Institute with repeated CRP and cognitive test scores at baseline (2006/2008), year 4 (2010/2012), and year 8 (2014/2016) for a national sample of older adults in the Health and Retirement Study ( $N = 10,500$ , aged  $>50$ ). In multivariable generalized estimating equation models, we compared participants (by racialized group) living in states with high lynching proportions ( $>50$ th percentile) on changes in CRP and cognitive test scores adjusting for demographics, health conditions, and behaviors. Mean age was 69 (SD = 9.9) and most participants were cisgender women (59%). On average participants racialized as non-LatinX Black living in states with high lynching proportions experienced 18.5% (95% CI 3%, 36%) higher CRP levels and  $-0.92$  (95% CI  $-1.34$ ,  $-0.50$ ) lower cognitive test scores than participants racialized as non-LatinX Black that lived in states with lower lynching proportions. As artist Marvin Gaye sang in *Flyin' High (in the Friendly Sky)*, “Rest of the folks are tired and weary,” which describes how adverse childhood racism is associated with inflammation and dementia risk for people racialized as Black.

## 1. Introduction

“I had never in my life been abused by whites, but I had already become as conditioned to their existence as though I had been the victim of a thousand lynchings” (Wright, 1994, p.74).

Differential dementia risk across racialized groups is significantly impacted by the disparate exposure to the biological and cognitive harm that occurs as a result of racialization (Manly et al., 2022; Tejera et al., 2023). Early life exposures may be more predictive of late life cognitive health than midlife (Tejera et al., 2023), and cumulative exposure to

\* Corresponding author.

E-mail addresses: [pa2629@cumc.columbia.edu](mailto:pa2629@cumc.columbia.edu) (P.B. Adkins-Jackson), [chiggi25@jh.edu](mailto:chiggi25@jh.edu) (C.H. Tejera), [dc3564@cumc.columbia.edu](mailto:dc3564@cumc.columbia.edu) (D. Cotton-Samuel), [cf2272@cumc.columbia.edu](mailto:cf2272@cumc.columbia.edu) (C.L. Foster), [laurenlb@usc.edu](mailto:laurenlb@usc.edu) (L.L. Brown), [ktwatson@american.edu](mailto:ktwatson@american.edu) (K.T. Watson), [tford5@uic.edu](mailto:tford5@uic.edu) (T.N. Ford), [tbragg@bu.edu](mailto:tbragg@bu.edu) (T. Bragg), [bbw2116@cumc.columbia.edu](mailto:bbw2116@cumc.columbia.edu) (B.B. Wondimu), [jjm71@cumc.columbia.edu](mailto:jjm71@cumc.columbia.edu) (J.J. Manly).

<https://doi.org/10.1016/j.socscimed.2024.117537>

Received 10 April 2024; Received in revised form 18 November 2024; Accepted 19 November 2024

Available online 22 November 2024

0277-9536/© 2024 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

racism may play a unique role in physiological deterioration (George et al., 2020, 2023; Peterson et al., 2021a,b). Nascent literature suggests exposure to structural racism via residential and school segregation are key indicators of cognitive function after age 50 (Aiken-Morgan et al., 2015; Peterson et al., 2021a,b; Pohl et al., 2021). This literature is strengthened by interdisciplinary research on adverse childhood experiences that describes the cognitive impact on children and young adults (Bellis et al., 2019; Hughes et al., 2017), in addition to having lingering effects on longevity (Lamar et al., 2020; Barnes et al., 2012).

### 1.1. Lynching as a traumatic event in the United States

There are numerous traumatic events that contemporary older adults have endured throughout history that may contribute to later-life dementia risk (Coogan et al., 2020). The most commonly explored experiences of structural racism are school and residential segregation, which are captured by determining whether the individual attended a school that was segregated or integrated, or calculating a proportion of residents racialized as Black compared to racialized as White in a geographic area (e.g., zip code, county), respectively (Aiken-Morgan et al., 2015; Peterson et al., 2021a,b; Pohl et al., 2021). Less examined aspects of structural racism include historical lynchings. A lynching is the unlawful act of murdering an individual based on how said individual is racialized (n.d., 1904). Often, excuses given for lynchings were that the individual was alleged or proven to have committed a criminal offense or violation of social order. In the United States (U.S.), people racialized as Black were the primary victims of lynchings, with about 72% of people lynched being racialized as Black (The NAACP Website, n.d.). However, they weren't the only lynching victims; there were also people racialized as White who were lynched for helping/aiding/supporting people racialized as Black, as well as immigrants from Mexico, China, Australia, the Philippines, and other countries (Rigby and Seguin, 2018; Seguin and Rigby, 2019; Carrigan and Webb, 2003). Largely, lynchings against people racialized as Black were widespread immediately following the Emancipation Proclamation of 1864 issued by President Abraham Lincoln, which legally declared people racialized as Black free from American chattel slavery. The Reconstruction Act of 1867 instilled suffrage and organized labor unions, issuing in a brief era of socioeconomic and political growth for formerly enslaved workers (National Archives, 2017; Foner et al., 1968). The backlash of that temporary progress was the promotion of a culture that encouraged the subjugation of people racialized as Black, lynchings were a part of that culture. In addition to state laws justified by the 1896 Plessy vs. Ferguson Supreme Court ruling declaring that people racialized as Black should live "separate but equal" to people racialized as White.

Lynchings have historically occurred in places whereby other determinants of structural racism like residential and occupational segregation facilitated the targeting of people racialized as Black with violence (Cook et al., 2018). Lynchings were used as a tool of terror, intimidation, and control by people racialized as White to inspire and maintain Jim Crow de facto segregation laws that separated neighborhoods, residences, employment, schooling, and public services and resources (n.d., 1906). Lynchings were carried out by individuals and mobs with the institutional protection of the U.S. criminal-legal system (n.d., 1902). Thus, "separate but equal" did not apply to the criminal-legal apparatus, as this system excluded groups like those racialized as Black from the human right to safety, thereby increasing this group's vulnerability to vigilante violence and extrajudicial killings. In this way, the normativity of and habituation to systemic violence generated conditions that approximate social death, or a social-legal rendering into the category of non-human, for individuals racialized as Black (Patterson, 1982; Price, 2015). The Klu Klux Klan (KKK), a terrorist organization established the year after emancipation in 1865, worked to combat Reconstruction efforts through intimidation tactics like performing public lynchings (History.com, 2009a,b). These terrorist

actions were state-sanctioned as few Klansmen were held accountable by U.S. courts for lynchings (n.d., 1947). Other non-KKK affiliated individuals and organizations (including police officers) participated in lynching people racialized as Black with some events drawing large crowds of observers and memorabilia (Basu, 2023). The act of lynching, by hanging someone on a tree, has been largely phased out as a widely used public practice. According to data from the National Association for the Advancement of Colored People (NAACP), from 1882 to 1968, 4,743 lynchings occurred in the U.S.; however, this is likely extremely underreported because there was no formal tracking (The NAACP Website, n.d.). Contemporary killings of people racialized as Black for the same racist reasons persist and are often inconspicuously indistinguishable from crime or health disparities that disproportionately impact people racialized as Black (Ferdows et al., 2020).

### 1.2. Mechanisms connecting lynching and health

There are two types of potential exposures to lynching that contemporary older adults racialized as Black may have experienced: 1) adverse childhood experiences, which would include lynching during their lifetimes; and 2) historical lynching, which are adverse experiences occurring largely prior to the childhoods of contemporary older adults. Much of the evidence that exists to support the connection between lynching posits that lynching is an adverse childhood experience that elicits stress via cumulative tax on the body that may result in age acceleration (i.e., biological aging) and cognitive decline (Lavretsky and Newhouse, 2012; Glymour and Manly, 2008; Graf et al., 2022; Guidi et al., 2021). Acute and chronic stressors physiologically influence each organ system resulting in detectable biological deviations from homeostatic function. Chronically high blood pressure and low levels of insulin are examples that reflect acutely impaired organ system function (e.g., circulatory and endocrine systems). An example of a cumulative biological response are biomarkers like allostatic overload, summations of weighted subclinical indicators that reflect physiological dysregulation that is associated with multimorbidity and early mortality (Geronimus et al., 2006). Well-articulated literature on biological stress, including allostatic overload, suggest C-reactive protein (CRP) is a key indicator of changes in the body's homeostasis due to a sustained stress response. CRP is part of the innate immune response, due to its rapid increases in synthesis within hours after tissue injury or infection. CRP is associated with vascular wear and premature arterial aging, making it a good indication risk for vascular dementia and Alzheimer's disease and related dementias (Zimmerman et al., 2003; Gutierrez et al., 2019). Elevated systemic inflammation is associated with biological aging (Liu et al., 2020), and 27% higher risk of incident dementia among older adults (50+) racialized as Black and/or LatinX (Tejera et al., 2023). It is probable that differential exposure to early life stressors established a trajectory of biological and cognitive experiences that meaningfully contributes to racialized disparities in dementia in late life (Glymour and Manly, 2008). There is also evidence that experiences of vicarious racism, like having a family member, friend, or community member lynched, likely produce similarly jarring effects. Witnessing or hearing about an individual being lynched in one's state informs knowledge that someone racialized similarly could be faced with this form of racialized terror and violence (Mitchell et al., 2020; Bor et al., 2018).

Historical lynchings, on the other hand, are adverse experiences occurring largely prior to or in the childhoods of contemporary older adults, and undoubtedly leave an indelible mark under the skin in the form of lesions on their minds, bodies, spirits, and time. The phrase sang by Marvin Gaye in *Flyin' High (in the Friendly Sky)*, "Rest of the folks are tired and weary and have laid their bodies down" (Gaye et al., 1971) elucidates the immense amount of stress and fatigue experienced by people racialized as Black due to structural racism. The scientific evidence linking historical lynching and intergenerational trauma to health is growing, suggesting that the impact of lynchings on health are multifaceted. It is biologically plausible that the psychological warfare

of targeting people racialized as Black through lynching manifests as a sustained stress response, as well as traumatizing and debilitating fear and anxiety that is forever imprinted and embodied in the physiology of the survivor or community member, and may impact future generations as well (Krieger, 2016).

Furthermore, it is phenomenologically plausible that the psychological warfare of targeting people racialized as Black through lynching manifests by way of racial socialization and habituation across space and time and is enforced by the enduring legacy of structural racism (Ngo, 2016; Bonilla-Silva et al., 2006; Nunnally, 2012). In addition, the residual terror and stress from residing in a state where lynchings were frequent may continue because the criminal-legal system does not protect nor punish certain racialized groups (Demleitner, 2020). The residual stress of residing in a state where such historical acts occurred and have often morphed into other forms of state-sanctioned violence (like the prison industrial complex) may have important implications for the physiology of those who directly or indirectly experience the violent acts (Demleitner, 2020). In which case, the state policies and practices may linger over time to continue harming future generations; some studies illustrate the enduring legacy of historic state-level structural racism on the mental and cognitive health of adolescents and older adults, respectively (Adkins-Jackson et al., 2024a; Adkins-Jackson et al., 2024b).

Few studies explore the impact of lynchings on the health of people racialized as Black. An ecological study examining the association between historical lynchings and 2010–14 mortality rates documented a difference of 31–35 additional deaths for counties with the highest lynching rates compared to counties with the lowest (Probst et al., 2019). Another study observed that counties with the highest historic lynching rates explained 57% of the variance in 2019–20 life expectancy in the U.S. South, and counties with the lowest rates of historical lynchings had higher 2019–20 life expectancy (Kihlström and Kirby, 2021). Such studies provide a glimpse of the enduring impact of lynchings on the overall health of current residents in these regions. However, these studies confine the exposure to the county of residence.

States facilitate access to labor protection, education, housing, and healthcare; and mostly importantly, states determine criminal-legal policies and fund its infrastructure (i.e., police departments, sheriffs, courts, judges, jails, and prisons) (Karas Montez et al., 2019). Therefore, state-level historical lynchings are more salient than the county to capture the criminal-legal system's bestowing of impunity on individuals who engaged in lynchings against people racialized as Black. From lack of arrests to court rulings exonerating those incarcerated for performing a lynching, states openly conveyed their culture of subjugation of people racialized as Black and of structural racism (Brown and Homan, 2024). The frequency of lynchings in a state demonstrates the sociopolitical tolerance and promotion of violence towards people racialized as Black and is likely proportional to the severity of dehumanization that festered culturally in that state. A state's cultivation of racialized violence potentially characterizes the shared understandings of the vulnerability (i.e., lack of protection) of people racialized as Black, as well as the precedence of criminal-legal institutions to allow, and potentially enable, the lynching of people racialized as Black. Therefore, the act of lynching is an amalgamation of both individual and community early life stress exposures, both directly and indirectly with lingering critical periods of exposure. Examining these relationships may delineate the impact of structural and state sanctioned violence that began in the late 1800s on contemporary older adults with the goal of eliminating future consequences for the next generation.

This longitudinal study examines the relationship between state-level exposure to historical lynchings with individual-level trajectories of inflammation (as measured by CRP) and cognitive performance in a national sample of older adults racialized as Black, LatinX, and White (aged 51 and older). We expect that participants racialized as Black living in states with greater exposure to historical lynchings will have greater levels of systemic inflammation and lower cognitive

performance at midlife compared to participants racialized as Black living in states with less exposure. Given the exposure was uniquely targeted at people racialized as Black during this historical period, we do not expect to observe meaningful associations between study variables for participants racialized as White. However, given people racialized as LatinX did experience lynchings and have largely resided in neighborhoods with predominately residents racialized as Black, we performed an exploratory analysis to examine associations for participants racialized as LatinX.

## 2. Methods

### 2.1. Sample

We used biological and cognitive health data from the Health and Retirement Study (HRS) (<https://hrs.isr.umich.edu/data-products>), a national longitudinal cohort study of adults 51 and older. The first cohort began in 1992 and is replenished every six years. Biannually, core interviews are conducted via telephone or in-person to collect socio-demographic and health assessments from community-dwelling U.S. adults with a multistage probability design used to oversample adults racialized as Black and LatinX (Sonnegga et al., 2014; Langa et al., 2005). We pooled HRS core interviews by participants who provided informed consent and self-identified that are racialized as Non-LatinX Black, LatinX, and Non-LatinX White between 2006 and 2016. We excluded participants without baseline CRP data (2006 or 2008) and those with incomplete information in covariates. No proxy respondent data were used in this study and participants with severe cognitive impairment did not consent to biomarker assessment.

### 2.2. Study variables

*Lynchings (independent variable).* Historical lynchings refer to the multifaceted trauma-incurred due to adverse policing, exposure to people being lynched, fear of being lynched, lack of protection or justice from U.S. criminal-legal institutions—in addition to the long-term impact of these adverse experiences. We used state-level frequency of lynchings between 1882 and 1968 in 44 states from the Archives at Tuskegee Institute, Equal Justice Initiative ([Tuskegee University Archives Repository](https://tusenet.tuskegee.edu/archives-repository), 2020). We only included states with reported lynchings of people racialized as Black ( $N = 44$ ) due to the widespread practice of lynchings was largely targeted at people racialized as Black, which could inspire biological responses among people racialized similarly. We excluded states without reported lynchings of people racialized as Black to examine the cases under the condition as well as to avoid making assumptions about structural racism in the few states that did not report lynchings. We calculated the proportion of lynchings of people racialized as Black in each state as the number of lynchings per state divided by the total number of lynchings of people racialized as Black between 1882 and 1968. This approach allowed for examining states with lynchings in proportion to each other. Due to skewness, we dichotomized the variable at the 50th percentile (median), where less than the median corresponded to states with 1 lynching and greater than the median corresponded to states that had 2 or more lynchings. We then linked this variable to the HRS participant's state at the baseline interview.

*Cognitive performance (dependent variable).* The Telephone Interview for Cognitive Status (TICS) was used to capture participants' global cognitive test performance between 2006 and 2016 by telephone or in person (Brandt et al., 1988). The TICS captures global cognitive test performance across multiple domains of cognitive function, including memory through the immediate and delayed word list recall test, concentration through serial 7 subtraction test, and processing speed through backwards counting from 20. The total global cognitive score ranges from 0 to 27, with higher scores indicating better cognitive performance.

**C-reactive protein (dependent variable).** We used dried blood spot biomarker data from two distinct waves of the HRS. In the HRS dried blood study, a random half of HRS participants underwent biomarker assessment in 2006 and a second random half in 2008. For comparability, the HRS dried blood spot study converted CRP measurements to National Health and Nutrition Examination Survey equivalent values (Crimmins et al., 2013; Kim et al., 2024). Participants who had their baseline assessment in 2006/2008 (baseline) were followed every four years, with their second assessment in 2010/2012 (wave 1) until their last assessment in 2014/2016 (wave 2). From the baseline wave (2006/2008), we created a unique cohort with three repeated measurements of CRP. We normalized the distribution of CRP using natural log-transformed CRP values and conducted statistical analysis in log-transformed scale.

**Covariates.** We adjusted for the following individual-level variables at baseline: age in years (continuous) at baseline interview (2006/2008), baseline cisgender category (men [referent], women), baseline degree attainment (high school and below [referent], some college or college graduate, greater than college), body mass index (continuous), alcohol use (# of drinks/week when a person drinks, continuous), smoking status (current [referent], former, never), exercise (no [referent], yes), chronic health conditions (continuous, represents the number of health conditions including hypertension, diabetes, cancer, lung disease, heart disease, stroke, psychiatric problems, and arthritis), *APOE-e4* carrier status (no copy of the Apolipoprotein E gene that is a known risk factor for late-onset Alzheimer’s disease [referent], at least 1 copy of the Apolipoprotein E gene), baseline survey wave (2006 [referent], 2008), Southern state (not classified as a Southern state by the U.S. Census regions [referent], yes, classified as a Southern state by the U.S. Census regions). We refer to the men/women variable as “cisgender category” because the survey only included this binary.

**2.3. Data analysis**

We linked the state-level lynching proportions of people racialized as Black between 1882 and 1968 with repeated CRP and cognitive test scores at baseline (2006/2008), wave 2 (2010/2012), and wave 3 (2014/2016) for participants (*N* = 10,500, aged >50). We stratified the data to examine the unique associations among study variables within each racialized group (racialized as Black *N* = 1,349, racialized as LatinX *N* = 983, racialized as White *N* = 8,168). We performed multivariable generalized estimating equation (GEE) models with an identity link function, and exchangeable correlation matrix to compare longitudinal changes in CRP and cognitive test scores in participants living in states with greater exposure to historical lynchings (i.e., lynching proportion > or equal to the 50th percentile, or median). We created a series of GEE models adjusting by a different set of covariates to better understand the relationship between our primary exposure (historical lynching) and outcomes (CRP, and cognitive test performance trajectories). Model 1 adjusted for time, Model 2 further adjusted by age, cisgender category, degree attainment, *APOE-e4* carrier status, and wave at baseline. Model 3 further adjusted by smoking status, alcohol use, body mass index, and exercise; Model 4 further adjusted by chronic conditions; and Model 5 further adjusted by residence in a Southern state.

**3. Results**

**Variable and participant characteristics.** There were 44 states that reported historical lynchings between 1882 and 1968 (missing: Alaska, Connecticut, Hawaii, Massachusetts, New Hampshire, and Rhode Island). Of the 44 U.S. states with historic lynchings, 6 (%) reported zero lynchings for people racialized as Black (Arizona, Idaho, Nevada, South Dakota, Vermont, and Wisconsin)—though these states reported lynchings for people racialized as White. Delaware was the only state that reported no lynchings for people racialized as White but 1 lynching for a person racialized as Black. The number of lynchings of people

racialized as Black in 38 states ranged from 1 (Delaware, Maine, Michigan, New Jersey, New York, and Oregon) to 539 (Mississippi).

Table 1 summarizes participant characteristics. Mean age of participants was 67 (SD = 9.56) and most participants were cisgender women (64.1%). Among racialized groups, those racialized as Black resided in states with a higher proportion of lynchings, had on average higher CRP levels across years, had lower cognitive test performance across years, higher body mass index, more chronic conditions, and lived in Southern states. People racialized as LatinX were younger, few attended some

**Table 1**  
Distribution of baseline sample characteristics, C-reactive protein, and cognitive test performance by racialized group in the US Health and Retirement Study, 2006/2008.

Characteristic	Overall <i>N</i> = 10,500 <sup>a</sup>	LatinX <i>N</i> = 983 <sup>a</sup>	Non LatinX- Black <i>N</i> = 1,349 <sup>a</sup>	Non LatinX- White <i>N</i> = 8,168 <sup>a</sup>	<i>P</i> - value <sup>b</sup>
Lynching proportion	3.33 (4.52)	4.32 (4.70)	5.13 (5.48)	2.92 (4.23)	<0.001
CRP (µg/mL) at baseline	4.60 (8.61)	4.47 (6.60)	6.63 (12.66)	4.28 (7.92)	<0.001
CRP (µg/mL) at year 4 (Missing, <i>N</i> )	3.91 (8.62) 3,179	4.13 (10.36) 331	5.04 (8.36) 456	3.72 (8.43) 2,392	<0.001
CRP (µg/mL) at year 8 (Missing, <i>N</i> )	3.64 (6.65) 4,627	3.46 (5.60) 411	4.96 (7.75) 636	3.46 (6.56) 3,580	<0.001
Cognitive test at baseline (0–27 points)	15.20 (4.37)	13.06 (4.18)	12.66 (4.56)	15.88 (4.12)	<0.001
Cognitive test at wave 1 (0–27 points) (Missing, <i>N</i> )	14.71 (4.43) 1,850	12.77 (4.35) 174	12.31 (4.50) 252	15.33 (4.22) 1,424	<0.001
Cognitive test at wave 2 (0–27 points) (Missing, <i>N</i> )	14.46 (4.54) 3,574	12.33 (4.48) 304	11.99 (4.53) 480	15.13 (4.32) 2,790	<0.001
Age (years)	68.90 (9.93)	66.19 (9.40)	67.68 (9.58)	69.43 (9.98)	<0.001
% Women	6,168 (59%)	600 (61%)	863 (64%)	4,705 (58%)	<0.001
Degree attainment					<0.001
HS or <	7,769 (74%)	895 (91%)	1,129 (84%)	5,745 (70%)	
College	1,799 (17%)	67 (6.8%)	154 (11%)	1,578 (19%)	
> College	932 (8.9%)	21 (2.1%)	66 (4.9%)	845 (10%)	
Body mass index (kg/m <sup>2</sup> )	28.30 (5.88)	29.18 (5.72)	30.06 (6.94)	27.90 (5.64)	<0.001
Alcohol use (# of drinks/day when drinks)	0.67 (1.36)	0.64 (2.01)	0.51 (1.25)	0.70 (1.27)	<0.001
Smoking status					<0.001
Current	1,370 (13%)	122 (12%)	236 (17%)	1,012 (12%)	
Former	4,556 (43%)	390 (40%)	539 (40%)	3,627 (44%)	
Never	4,574 (44%)	471 (48%)	574 (43%)	3,529 (43%)	
Exercise (Yes)	8,104 (77%)	725 (74%)	917 (68%)	6,462 (79%)	<0.001
Chronic health (# chronic conditions)	2.06 (1.44)	1.84 (1.39)	2.32 (1.48)	2.04 (1.43)	<0.001
At least 1 copy of <i>APOE-e4</i>	1,153 (11%)	83 (8.4%)	156 (12%)	914 (11%)	0.026
% in Southern State	4,472 (43%)	458 (47%)	822 (61%)	3,192 (39%)	<0.001

CRP: C-reactive protein; *APOE-e4*: apolipoprotein E e4 carrier status.

<sup>a</sup> *N* (%); Mean (SD).

<sup>b</sup> Pearson’s Chi-squared test; One-way ANOVA.

college or post-undergraduate education, and most were never smokers. People racialized as White had higher alcohol use and reported exercising more. There were no statistically significant differences in *APOE-e4* carrier status or initial survey wave across racialized groups.

**Lynchings on CRP.** In the overall sample, participants living in states with higher proportions of lynchings had on average higher CRP levels except when midlife residence in a Southern state was included in the models (Table 2). These results differed by racialized group. For instance, participants racialized as Black that lived in states with higher proportions of lynchings (in midlife) experienced 18.5% (95% CI 3%, 36%) higher circulating CRP levels than participants racialized as Black that lived in states with lower proportions of lynchings. This association was evident when adjusting for all covariates except residence in a Southern state (Table 3). There were no statistically significant associations for participants racialized as LatinX, but there was a significant association for participants racialized as White in model 1. In the overall sample, circulating CRP was also significantly associated with lower cognitive test scores except when adjusting for chronic health conditions and residence in a Southern state (Table 2).

**Lynchings on cognitive test performance.** In the overall sample, participants living in states with higher proportions of lynchings had on average lower cognitive test performance except when residence in a Southern state was included in the models (Table 2). Like with CRP, the results differed by racialized group with participants racialized as Black (in midlife) living in states with higher proportions of lynchings experienced on average -1.09 (95% CI -1.58, -0.60) lower cognitive test scores than participants racialized as Black living in states with lower proportions of lynchings (model 1; Table 4). Results were attenuated by most covariates (model 4: -0.92, 95% CI -1.34, -0.50). Similar but more modest associations were observed for participants racialized as White ( $\beta$  coefficients ranging from -0.43 to -0.28). For both groups,

**Table 2**

Longitudinal associations using generalizing estimating equation (GEE) between lynchings (i.e., >50th percentile), C-reactive protein (CRP;  $\mu\text{g/mL}$ ), and cognitive test performance over an eight-year period in the overall sample.

Model	Dependent Variable			
	C-reactive Protein		Cognitive Test Performance	
	b	[95%CI]	b	[95%CI]
<b>Model 1</b>				
Cognitive test	0.10***	[0.06,0.14]	-0.72***	[-0.88,-0.56]
Log CRP	-	-	-0.08***	[-0.13,-0.04]
<b>Model 2</b>				
Cognitive test	0.09***	[0.05,0.13]	-0.66***	[-0.79,-0.52]
Log CRP	-	-	-0.05*	[-0.09,-0.01]
<b>Model 3</b>				
Cognitive test	0.06**	[0.02,0.10]	-0.58***	[-0.71,-0.44]
Log CRP	-	-	-0.03	[-0.07,0.01]
<b>Model 4</b>				
Cognitive test	0.05**	[0.01,0.09]	-0.55***	[-0.68,-0.41]
Log CRP	-	-	-0.02	[-0.06,0.02]
<b>Model 5</b>				
Cognitive test	-0.02	[-0.09,0.05]	0.03	[-0.20,0.26]
Log CRP	-	-	-0.02	[-0.06,0.02]
Observations	23,694		23,694	

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

<sup>1</sup>Model 1: adjusted for time.

<sup>2</sup>Model 2: adjusted for time, age, cisgender category, degree attainment, *APOE-e4* carrier status, and wave at baseline.

<sup>3</sup>Model 3: adjusted for time, age, cisgender category, degree attainment, *APOE-e4* carrier status, wave at baseline, smoking status, alcohol use, body mass index, and exercise.

<sup>4</sup>Model 4: adjusted for time, age, cisgender category, degree attainment, *APOE-e4* carrier status, wave at baseline, smoking status, alcohol use, body mass index, exercise, and chronic conditions.

<sup>5</sup>Model 5: adjusted for time, age, cisgender category, degree attainment, *APOE-e4* carrier status, wave at baseline, smoking status, alcohol use, body mass index, exercise, and chronic conditions, and Southern region.

associations became null when residence in Southern state was included in the model. There were no statistically significant associations for participants racialized as LatinX.

#### 4. Discussion

This study revealed a significant association between living in a state with a legacy of historical lynchings and worsened biological and cognitive health in participants racialized as Black. Not only did participants experience greater inflammation represented by CRP (~18.5%) but also lower global cognitive performance (~1.09 point lower) indicating the lingering effects of state-level racism on the health of contemporary adults (see Fig. 1 for illustration). These findings support other studies that indicate adverse childhood experiences are associated with greater risk for systemic inflammation, poor cognitive health, and dementia in older adults (Schickedanz, 2022; Roberts et al., 2022; Lowry et al., 2022; Ren et al., 2023).

Systemic inflammation, represented by CRP, reflects and interacts with many biological pathways that may accelerate aging and cognitive decline. The pathways are unclear as there may be inflammation co-occurring in the brain and subcranial (below the brain) or one may occur before observable changes in the other. Prior research demonstrates that exposure to structural racism can elicit a biological response, like chronic systemic inflammation, that then impacts cognitive function. We did not formally test a mediation analysis, but meaningful associations observed through multivariable analyses suggests structural racism does not only illicit poor cognitive performance via inflammatory pathways like CRP (Lowry et al., 2022; Akrivos et al., 2020). In which case, future studies need not be limited to pre-existing theories about pathways between exposures and outcomes to further delineate the impact of structural racism on dementia risk for older adults.

Perhaps a return to early literature by scholars from the fields of psychology and sociology may aid in a clearer interpretation of pathways. Harrell (2000) posits that there are six types of racism-related stress in racialized groups that can be characterized by direct (micro-stressors, significant events, chronic-contextual stress) and indirect experiences (vicarious racism, reminders of racism). In this framework, the transformation of exposure to structural racism into stress is the vital part of the pathway as what the body does to process, heal from, and respond to that stress can vary from elevated blood pressure, heart palpitations, risky behaviors, to glucose intolerance (Harrell, 2000). Surely systemic inflammation and neurodegeneration could be included. There is also Clark et al. (1999) who adopted the biopsychosocial model to elucidate the intersection of physiological, psychological, and social factors that overlap to produce health disparities. Thus, future research might re-imagine pathways based on multidisciplinary frameworks.

There were unexpected associations for people racialized as White between historical lynchings and cognitive test performance. While there were people racialized as White hanged from trees at the time, some of which for being sympathizers of the plight of people racialized as Black, people racialized as White were not harassed, surveilled, and threatened with death due to how they were racialized. Additionally, justice for the murders of people racialized as White was largely handled by the courts; thus, the racist nature and consequence of lynchings were not expected to have had health-related implications for participants racialized as White. Although, there is evidence that White privilege, the intended goal of structural racism, does not always get equally distributed among people racialized as White (Adkins-Jackson et al., 2024a). Given that the statistical association between historical lynchings and the outcomes of interest dissipates when residence in a Southern state is included, it is likely that structural racism against people racialized as Black co-occurred with structural racism-related factors, such as economic underdevelopment, which created a “universal harm” (Brown and Homan, 2024) that also adversely impacted people racialized as White in the U.S. South. Subsequently, the health outcomes of both

**Table 3**

Longitudinal associations using generalizing estimating equation (GEE) between lynchings (i.e., >50th percentile) and C-reactive protein (µg/mL) over an eight-year period by racialized group.

Dependent Variables	Independent Variable: Dichotomized Lynching Proportion					
	Non-LatinX Black		LatinX		Non-LatinX White	
	b	[95%CI]	b	[95%CI]	b	[95%CI]
<b>Model 1</b>						
Log CRP	0.17*	[0.03,0.31]	0.09	[-0.04,0.21]	0.05*	[0.01,0.10]
<b>Model 2</b>						
Log CRP	0.16*	[0.02,0.31]	0.08	[-0.05,0.21]	0.04	[-0.00,0.09]
<b>Model 3</b>						
Log CRP	0.17*	[0.04,0.31]	0.03	[-0.09,0.16]	0.03	[-0.01,0.07]
<b>Model 4</b>						
Log CRP	0.17*	[0.04,0.30]	0.04	[-0.08,0.16]	0.02	[-0.02,0.06]
<b>Model 5</b>						
Log CRP	-0.02	[-0.21,0.17]	-0.09	[-0.54,0.36]	-0.02	[-0.10,0.05]
Observations	2,955		2,207		18,532	

\**p* < 0.05, \*\**p* < 0.01, \*\*\**p* < <0.001.

Model 1: adjusted for time.

Model 2: adjusted for time, age, cisgender category, degree attainment, *APOE-e4* carrier status, and wave at baseline.

Model 3: adjusted for time, age, cisgender category, degree attainment, *APOE-e4* carrier status, wave at baseline, smoking status, alcohol use, body mass index, and exercise.

Model 4: adjusted for time, age, cisgender category, degree attainment, *APOE-e4* carrier status, wave at baseline, smoking status, alcohol use, body mass index, exercise, and chronic conditions.

Model 5: adjusted for time, age, cisgender category, degree attainment, *APOE-e4* carrier status, wave at baseline, smoking status, alcohol use, body mass index, exercise, and chronic conditions, and Southern region.

**Table 4**

Longitudinal associations using generalizing estimating equation (GEE) between lynchings (i.e., >50th percentile), C-reactive protein (CRP; µg/mL), and cognitive test performance over an eight-year period by racialized group.

Dependent Variables	Independent Variable: Dichotomized Lynching Proportion					
	Non-LatinX Black		LatinX		Non-LatinX White	
	b	[95%CI]	b	[95%CI]	b	[95%CI]
<b>Model 1</b>						
Cognitive test	-1.09***	[-1.58,-0.60]	0.12	[-0.37,0.62]	-0.43***	[-0.60,-0.26]
Log CRP	0.16**	[0.04,0.29]	-0.14	[-0.28,0.01]	-0.07**	[-0.12,-0.02]
<b>Model 2</b>						
Cognitive test	-0.96***	[-1.39,-0.53]	0.18	[-0.27,0.63]	-0.39***	[-0.53,-0.25]
Log CRP	0.14*	[0.03,0.26]	-0.15*	[-0.29,-0.02]	-0.03	[-0.07,0.02]
<b>Model 3</b>						
Cognitive test	-0.94***	[-1.36,-0.51]	0.20	[-0.24,0.65]	-0.32***	[-0.46,-0.18]
Log CRP	0.13*	[0.02,0.25]	-0.15*	[-0.29,-0.01]	-0.02	[-0.07,0.02]
<b>Model 4</b>						
Cognitive test	-0.92***	[-1.34,-0.50]	0.15	[-0.30,0.59]	-0.28***	[-0.43,-0.14]
Log CRP	0.14*	[0.02,0.25]	-0.14*	[-0.28,-0.00]	-0.01	[-0.06,0.03]
<b>Model 5</b>						
Cognitive test	0.15	[-0.47,0.76]	-0.07	[-1.81,1.67]	-0.09	[-0.33,0.14]
Log CRP	0.15*	[0.03,-0.00]	-0.14*	[-0.28,-0.00]	-0.01	[-0.06,0.04]
Observations	2,955		2,207		18,532	

\**p* < 0.05, \*\**p* < 0.01, \*\*\**p* < <0.001.

Model 1: adjusted for time.

Model 2: adjusted for time, age, cisgender category, degree attainment, *APOE-e4* carrier status, and wave at baseline.

Model 3: adjusted for time, age, cisgender category, degree attainment, *APOE-e4* carrier status, wave at baseline, smoking status, alcohol use, body mass index, and exercise.

Model 4: adjusted for time, age, cisgender category, degree attainment, *APOE-e4* carrier status, wave at baseline, smoking status, alcohol use, body mass index, exercise, and chronic conditions.

Model 5: adjusted for time, age, cisgender category, degree attainment, *APOE-e4* carrier status, wave at baseline, smoking status, alcohol use, body mass index, exercise, and chronic conditions, and Southern region.

racialized groups are intertwined when structural racism is examined.

There were no associations for people racialized as LatinX. Though the exposure was rooted in the experiences of people racialized as Black, those racialized as LatinX have largely resided in U.S. neighborhoods with residents racialized as Black. Hence it is likely that people racialized as Black and/or LatinX share racist, high-contact policing as well as economic deprivation. However, some studies suggest there is a differential occupational opportunity for people racialized as LatinX in shared neighborhoods (Elliott and Sims, 2001), which may explain the lack of

associations between structural racism experienced by one group and the health outcomes of their neighbors.

This study focuses on a lesser-studied facet of structural racism, though history indicates multiple domains of racism are salient (Bailey et al., 2017). The criminal-legal system, media, religion, and political institutions play prominent roles in structural racism. The failure of the criminal-legal system to provide equal protection to people racialized as Black has been a consistent stressor across time. There are prominent contemporary examples of a lack of accountability of people racialized

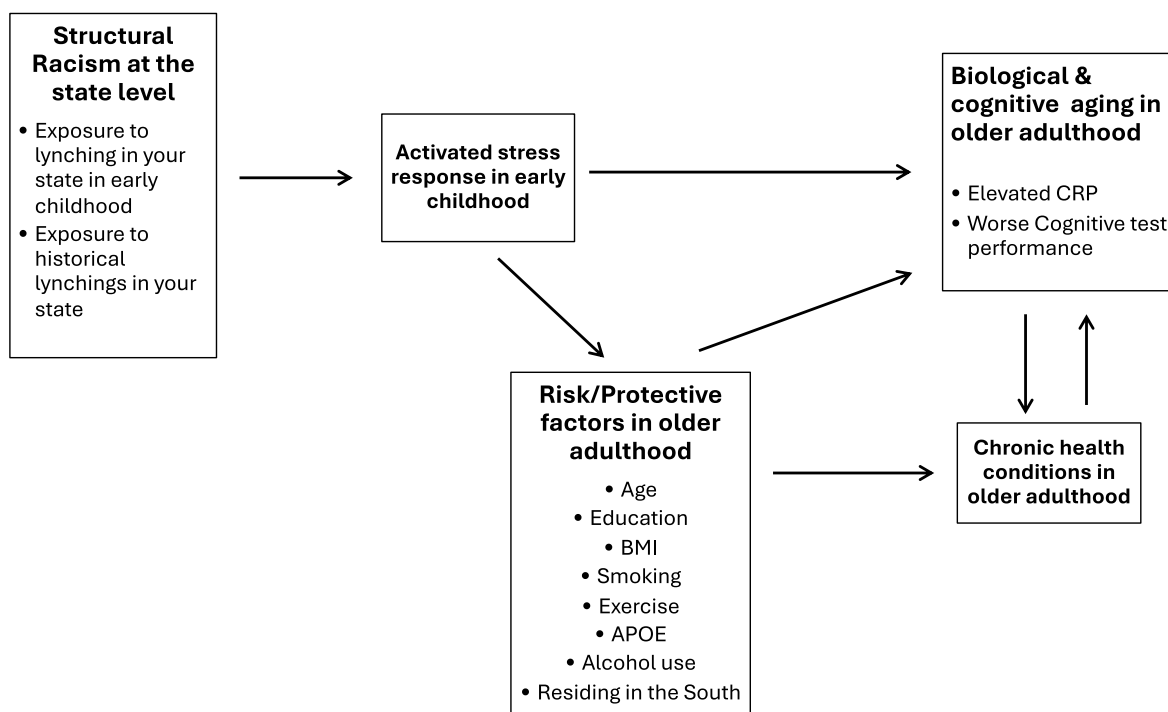


Fig. 1. Conceptual model of hypothesized pathway of proportion of historic lynchings on C-reactive protein and cognitive test performance.

as White for terrorizing and murdering people racialized as Black (History.com, 2009a,b; CNN Editorial Research, 2024). In media, the first American film, *The Birth of a Nation*, propagandized the proposed deleterious impact of the freedom of people racialized as Black, elevating the cause of the KKK and ushering in an era where “lynching emerged as a type of American pastime”, obscuring ethic of contemporaneous practices of scientific racism by film producer D.W. Griffith who popularized “the representation of Negro inferiority in the authority of documented history” (Baker, 1998, pp. 131–132). The film grossed \$50 to 100 million, was widely attended, and even screened in the White House by President Woodrow Wilson (Monaco, 2009).

For religion, one study identified associations between religious heterogeneity and increased lynchings at the county-level (Bailey et al., 2011). The study noted that when people racialized as Black attended separate churches, there was an association with greater lynchings (Bailey et al., 2011). Political party affiliation is also relevant; at the time, the Democratic Party gave prominent positions of power to racists and likely protected Klansmen and others from prosecution (Smångs, 2016). Therefore, a multifaceted approach may be more useful in identifying the unique burden people racialized as Black endure due to structural racism. Though such factors may serve as confounders.

Additionally, there is research needed on the mutually reinforcing determinants of structural racism. One study observed that lynchings accounted for a growth in incarceration of people racialized as Black from 1972 to 2000 (Jacobs et al., 2012). Another study observed that the greater the county-level Confederate memorializations, the greater the lynching victims (Henderson et al., 2021). People lynched were among the homeowners and literate persons of a community suggesting the economic disenfranchisement of people racialized as Black occurred in tandem with lynchings (Bailey et al., 2011). Forensic and sociopolitical research also indicates the decrease in lynching as a practice of civic justice coincided with the proliferation of capital punishment and the death penalty in carceral settings for people racialized as Black (Rigby and Seguin, 2021). Therefore, incarceration may be a prominent determinant.

Among the dementia literature, socioeconomic factors are the most prevalent structural factors examined. Though racism is often analyzed

separate from socioeconomic factors in dementia research despite in the context of the U.S., they are inextricably linked (Adkins-Jackson et al., 2024a; Green et al., 1998). Research examining lesser studied determinants of structural racism as well as unadjusted relationships among socioeconomic factors is merited, especially pertaining to older adults who endured the impact of structural racism across the life course.

While research is needed to describe pathways and mutually reinforcing determinants, it would be more helpful and less deleterious to groups most impacted by structural racism for studies to explore interventions as a strategy to learn more about mechanisms (Neta et al., 2018). It can be inferred from the aforementioned studies that slavery-adjacent economic behavior and reverence for the enslavement of people racialized as Black begets cyclical racial violence, for which, reparations and restorative healing are needed interventions (Christopher et al., 2021; Watson et al., 2024). Yet few health studies examine restorative interventions or practices for structural racism. Though interventions to understand the mechanisms of structural racism that also aim to disrupt their impact requires multidisciplinary collaboration to address the role of adverse events in history on the health of contemporary older adults (Bailey and Washington, 2021). Our study highlights the link between a historical measure of structural racism and human health. The higher levels of systemic inflammation and the progressive cognitive deterioration exhibited by participants racialized as Black living in states with a greater history of racial violence denotes how historical racism not only has deleterious effects throughout the lifespan of an individuals, but how its effects reverberate across generations. Therefore, interventions might consider an inter-generational approach.

**Limitations.** There are important limitations to this study. First, historical data on lynchings may be incomplete and vary in quality from state to state due to underreporting and inconsistent data collection practices. The number of lynchings is meaningfully underreported as it was impacted by the fact that there was no formal reporting system in the U.S. documenting these traumatizing events increasing the likelihood of reporting bias. Also, all observed associations were null when current residence in a Southern state was introduced to the model. There

is a strong relationship between living in the U.S. South with CRP and cognitive outcomes (George et al., 2021). While region is often used as a covariate in national studies, the role of history must be considered in research on structural racism. The U.S. South is a historic site for American chattel slavery that created states where many people racialized as Black resided and subsequently were targeted for lynching. As 99.9% of research participants who lived in a state with a lynching proportion above the median also reported living in the U.S. South (Fisher's exact test  $p$ -value  $<0.001$ )—this results in the South being a key factor in the relationship between historical lynchings and biological and cognitive health that cannot be adjusted for. Conversely, participants residing in Northern states would be expected to have fewer lynchings and smaller proportions of residents racialized as Black, and therefore, lower CRP and higher cognitive function. The high overlap of participants living in U.S. South and a state with high lynching proportions may have induced some collinearity in our fully adjusted models. We caution the reader with the interpretation of those estimates,  $p$ -values, and associated confidence intervals.

Our models likely include potential mediator variables in the association between historical lynchings, systemic inflammation, and cognitive performance. These mediating factors (body mass index, alcohol consumption, and smoking) are considered pro-inflammatory, and may influence CRP levels in blood and cognitive trajectories. We were interested in estimating the direct effect of historical lynchings on both outcomes of interest; thus, we operationalized these potential mediators as confounding variables. Prior research demonstrated that systemic inflammation may be a mediating mechanism of racial disparities in incident dementia even when mediator-outcome confounders affected by the exposure are present (i.e., APOE- $\epsilon$ 4 and education) (Tejera et al., 2023). Future research should explore the role of multiple behavioral and biological mediators on the association between structural racism measures (lynchings, etc.) and cognitive health. Lastly, there is limited life course information for participants in the Health and Retirement Study that may illuminate salient information such as length of time in a geographic area. Future research should explore such questions with a comprehensive life course dataset.

## 5. Conclusion

This study merely captures 86 years of exposure to racialized terrorism towards people racialized as Black in the U.S. for which no beta estimate can adequately quantify the quantity and quality of life lost (Alang et al., 2022). This study does identify how structural racism, via lynchings, provokes stress responses that trigger immune and inflammatory responses that add additional burdens to the existing balancing act of organ systems to maintain homeostasis (Adkins-Jackson et al., 2023), and may ultimately contribute to cognitive performance (Libby, 2007). Multiple determinants of structural racism, like geographic segregation throughout contemporary history (e.g., red-lining, redzoning, displacement, gentrification), influence the area-level deprivation and neighborhood quality we observe in the present, which are already linked with adverse brain health (Peterson et al., 2021a,b; Powell et al., 2020). Though lesser-studied, the impact of lynchings have always been observed as deleterious by scholars racialized as Black. In the 1890s, journalist and civil rights activist Ida B. Wells-Barnett compiled data on people racialized as Black in her book, *The Red Record*. She also organized a campaign to legally ban the act of lynching (Mobley, 2021). In 2022, the passing of the long-fought for U.S. House of Representative Bill 55, the Emmett Till Antilynching Act of 2022 (Emmett Till Antilynching Act. 18 U.S.C. § 249, 2022), catapulted the act of lynching from a crime to a hate crime. This act coupled with the 1964 and 1968 iterations of the Civil Rights Act, made discrimination illegal. Though arguably, the murders of people racialized as Black are still a mass-media event with a global reach (Carr, 2016). With an understanding of U.S. history, community-partnered, policy-driven interventions are needed that both illuminate the biopsychosocial

pathways that fuel dementia risk and interrupt or delay impact. Science need not ignore or de-prioritize key exposures that are a part of the lived experiences of people for whom science serves. A greater understanding of history and childhood exposures allows for innovative interventions in mid-to-late life that can reduce the burden of structural racism on this still aging population, as well as their descendants. Restorative justice practices beyond the acknowledgement of lynchings—like culturally-appropriate mental health care, expanding community-based resources, reducing noise from helicopters and police sirens at night, affordable and accessible housing, fall prevention support, access to healthy food, and other determinants that support biological and cognitive health, like reparations (Himmelstein et al., 2022). Though these results are clear that without intervention, there will be future generations enduring the same pathways outlined in this article.

## CRedit authorship contribution statement

**Paris B. Adkins-Jackson:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **César Higgins Tejera:** Writing – review & editing, Writing – original draft, Investigation, Formal analysis, Data curation, Conceptualization. **Dejania Cotton-Samuel:** Writing – original draft. **Carla L. Foster:** Writing – original draft, Formal analysis. **Lauren L. Brown:** Writing – original draft, Methodology. **Kenjus T. Watson:** Writing – original draft, Conceptualization. **Tiffany N. Ford:** Writing – original draft, Investigation. **Tahlia Bragg:** Writing – original draft. **Betselot B. Wondimu:** Writing – original draft. **Jennifer J. Manly:** Writing – review & editing.

## Ethics approval statement

This study was approved in 2023 by the Columbia University Institutional Review Board.

## Funding sources

This work was supported by the National Institute of Aging [DP1AG069874-01S1; 1K01AG081454-01 (Adkins-Jackson); 3R01AG067592-01S1 (Higgins Tejera); 1K01AG081842-01 (Brown); 1DP1AG069873-01; 3R01AG074213-02S1 (Bragg); P30AG059303 (Manly)]; Alzheimer's Association [AARGD-22-973213 (Adkins-Jackson)]; University of Michigan Rackham Merit Fellowship, the Black Men's Brain Health Emerging Scholar Program [(Higgins Tejera) (Bragg)]; National Institute of Mental Health [T32MH128395-01] (Wondimu); and National Science Foundation Graduate Research Fellowship Program [2036197] (Wondimu).

## Declaration of competing interest

The authors have no conflicts to report.

## Acknowledgments

We would like to thank 1) Ida B. Wells-Barnett, the Archives at Tuskegee Institute, Equal Justice Initiative, and Northeastern University Civil Rights and Restorative Justice Project for documenting these stories, 2) Attorney Raymond Wilkes for his consultation, 3) Dr. Boeun Kim and Muriel Taks Calle for support with data management, and 3) the participants of the Health and Retirement Study that shared their stories and experiences.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.socscimed.2024.117537>.



## Data availability

These data are publicly available at Archives at Tuskegee Institute and Health and Retirement Study databases.

## References

- Adkins-Jackson, P.B., Joseph, V.A., Ford, T.N., Avila-Rieger, J.F., Gobaud, A.N., Keyes, K., 2024a. State-level structural racism and adolescent mental health in the United States. *Am. J. Epidemiol.* <https://doi.org/10.1093/aje/kwae164> kwae164. Advance online publication.
- Adkins-Jackson, P.B., Kim, B., Higgins Tejera, C., Ford, T.N., Gobaud, A.N., Sherman-Wilkins, K.J., Turney, I.C., Avila-Rieger, J.F., Sims, K.D., Okoye, S.M., Belsky, D.W., Hill-Jarrett, T.G., Samuel, L., Solomon, G., Cleve, J.H., Gee, G., Thorpe Jr., R.J., Crews, D.C., Hardeman, R.R., Bailey, Z.D., et al., 2024b. "Hang ups, let downs, bad breaks, setbacks": impact of structural socioeconomic racism and resilience on cognitive change over time for persons racialized as black. *Health Equity* 8 (1), 254–268. <https://doi.org/10.1089/heap.2023.0151>.
- Adkins-Jackson, P.B., George, K.M., Besser, L.M., Hyun, J., Lamar, M., Hill-Jarrett, T.G., Bublu, O.M., Flatt, J.D., Heyn, P.C., Cicero, E.C., Zarina Kraal, A., Pushpalata Zanwar, P., Peterson, R., Kim, B., Turner 2nd, R.W., Viswanathan, J., Kulick, E.R., Zuelsdorff, M., Stites, S.D., Arce Renteria, M., et al., 2023. The structural and social determinants of Alzheimer's disease related dementias. *Alzheimer's Dementia : J. Alzheimer's Assoc.* 19 (7), 3171–3185. <https://doi.org/10.1002/alz.13027>.
- Aiken-Morgan, A.T., Gamaldo, A.A., Sims, R.C., Allaire, J.C., Whitfield, K.E., 2015. Education desegregation and cognitive change in African American older adults. *J. Gerontol. B Psychol. Sci. Soc. Sci.* 70 (3), 348–356. <https://doi.org/10.1093/geronb/gbu153>.
- Akrovos, J., Zhu, C.W., Haroutunian, V., 2020. Role of cumulative biological risk in mediating socioeconomic disparities in cognitive function in the elderly: a mediation analysis. *BMJ Open* 10 (9), e035847. <https://doi.org/10.1136/bmjopen-2019-035847>.
- Alang, S., VanHook, C., Judson, J., et al. Adkins-Jackson, P.B., 2022. Police brutality, heightened vigilance, and the mental health of Black adults. *Psychol. Violence* 12 (4), 211. <https://doi.org/10.1037/vio0000418>.
- Bailey, A.K., Washington, P.E., 2021. Lynching in the New South, festival of violence, and the synergy of two disciplines. *J. Gilded Age Progress. Era* 20 (1), 74–80. <https://doi.org/10.1017/s1537781420000481>.
- Bailey, A.K., Tolnay, S.E., Beck, E.M., et al., 2011. Targeting lynch victims: social marginality or status transgressions? *Am. Socio. Rev.* 76 (3), 412–436. <https://doi.org/10.1177/0003122411407736>.
- Bailey, Z.D., Krieger, N., Agénor, M., Graves, J., Linos, N., Bassett, M.T., 2017. Structural racism and health inequities in the USA: evidence and interventions. *Lancet (London, England)* 389 (10077), 1453–1463. [https://doi.org/10.1016/S0140-6736\(17\)30569-X](https://doi.org/10.1016/S0140-6736(17)30569-X).
- Baker, L.D., 1998. *The New Negro and cultural politics of race. In: From Savage to Negro: Anthropology and the Construction of Race, 1896-1954.* University of California Press.
- Barnes, L.L., Wilson, R.S., Everson-Rose, S.A., Hayward, M.D., Evans, D.A., Mendes de Leon, C.F., 2012. Effects of early-life adversity on cognitive decline in older African Americans and whites. *Neurology* 79 (24), 2321–2327. <https://doi.org/10.1212/WNL.0b013e318278b607>.
- Basu, S., 2023. The aestheticization of politics: the case of lynching photographs. *Modernism/Modernity Print Plus* 7 (3). <https://doi.org/10.26597/mod.0250>.
- Bellis, M.A., Hughes, K., Ford, K., Ramos Rodriguez, G., Sethi, D., Passmore, J., 2019. Life course health consequences and associated annual costs of adverse childhood experiences across Europe and North America: a systematic review and meta-analysis. *Lancet Public Health* 4 (10), e517–e528. [https://doi.org/10.1016/S2468-2667\(19\)30145-8](https://doi.org/10.1016/S2468-2667(19)30145-8).
- Bonilla-Silva, E., Goar, C., Embrick, D.G., 2006. When whites flock together: the social psychology of white habitus. *Crit. Sociol.* 32 (2–3), 229–253. <https://doi.org/10.1163/15691630677835268>.
- Bor, J., Venkataramani, A.S., Williams, D.R., Tsai, A.C., 2018. Police killings and their spillover effects on the mental health of black Americans: a population-based, quasi-experimental study. *Lancet (London, England)* 392 (10144), 302–310. [https://doi.org/10.1016/S0140-6736\(18\)31130-9](https://doi.org/10.1016/S0140-6736(18)31130-9).
- Brandt, J., Spencer, M., Folstein, M., 1988. The telephone interview for cognitive status. *Neuropsychiatr., Neuropsychol. Behav. Neurol.* 1 (2), 111–118.
- Brown, T.H., Homan, P., 2024. Structural racism and health stratification: connecting theory to measurement. *J. Health Soc. Behav.* 65 (1), 141–160. <https://doi.org/10.1177/00221465231229294>.
- Carr, J., 2016. The lawlessness of law: lynching and anti-lynching in the contemporary USA. *Settler Colonial Stud.* 6 (2), 153–163. <https://doi.org/10.1080/2201473X.2015.102438>.
- Carrigan, W.D., Webb, C., 2003. The lynching of persons of Mexican origin or descent in the United States, 1848 to 1928. *J. Soc. Hist.* 37 (2), 411–438.
- Christopher, G.C., Crow, Q.N.L.M., Greenberg, M., Tabron, J.M., Zeitz, P., Pentikainen, A., Rico, J.A., McNair, T.B., Austin, A.W., Chavis, C., Oliver, I., Hosey, D., Hou, G., Hipple, A., Gopal, S.S., Hunter, M.A., Adamson, H., 2021. U.S. Truth, racial healing, and transformation funders' briefing Program, January 19, 2021. *Health Equity* 5 (1), 639–655. <https://doi.org/10.1089/heap.2021.29006.trht>.
- Clark, R., Anderson, N.B., Clark, V.R., Williams, D.R., 1999. Racism as a stressor for African Americans. A biopsychosocial model. *Am. Psychol.* 54 (10), 805–816. <https://doi.org/10.1037/0003-066x.54.10.805>.
- CNN Editorial Research, 2024. Trayvon Martin shooting fast facts. CNNWebsite. Retrieved. <https://www.cnn.com/2013/06/05/us/trayvon-martin-shooting-fast-facts/index.html>. (Accessed 18 February 2024).
- Coogan, P., Schon, K., Li, S., Cozier, Y., Betheta, T., Rosenberg, L., 2020. Experiences of racism and subjective cognitive function in African American women. *Alzheimer's Dementia* 12 (1), e12067. <https://doi.org/10.1002/dad2.12067>.
- Cook, L.D., Logan, T.D., Parman, J.M., 2018. Racial segregation and southern lynching. *Soc. Sci. Hist.* 42 (4), 635–675. [https://www.nber.org/system/files/working\\_paper/w23813/w23813.pdf](https://www.nber.org/system/files/working_paper/w23813/w23813.pdf).
- Crimmins, E., Faul, J., Kim, J.K., et al., 2013. HRS documentation report documentation of biomarkers in the 2006 and 2008 health and retirement study. Retrieved. <http://hrsonline.isr.umich.edu/modules/meta/2010/core/qnaire/online/2010/PhysicalMeasuresBio>. (Accessed 13 April 2024).
- Demleitner, N.V., 2020. State prosecutors at the center of mass imprisonment and criminal justice reform. *Fed. Sentencing Report.* 32 (4), 187–194. <https://scholarlycommons.law.wlu.edu/cgi/viewcontent.cgi?article=1613&context=wlufac>.
- Elliott, J.R., Sims, M., 2001. Ghettos and barrios: the impact of neighborhood poverty and race on job matching among blacks and Latinos. *Soc. Probl.* 48 (3), 341–361. <https://doi.org/10.1525/sp.2001.48.3.341>.
- Emmett Till Antilynching Act. 18 U.S.C. § 249, 2022. Retrieved. <https://www.govinfo.gov/content/pkg/PLAW-117publ107/pdf/PLAW-117publ107.pdf>. (Accessed 25 March 2024).
- Ferdows, N.B., Aranda, M.P., Baldwin, J.A., Baghban Ferdows, S., Ahluwalia, J.S., Kumar, A., 2020. Assessment of racial disparities in mortality rates among older adults living in US rural vs urban counties from 1968 to 2016. *JAMA Netw. Open* 3 (8), e2012241. <https://doi.org/10.1001/jamanetworkopen.2020.12241>.
- Foner, P.S., Sims, W.H., Williams, G.H., McCormack, A., Mehurin, C.C., Mattox, M.I., Scott, B.W., 1968. The knights of labor. *J. Negro Hist.* 53 (1), 70–77. <https://doi.org/10.2307/2716391>.
- Gaye, A., Stover, E.R., Gaye, M.P., 1971. *Flyin' High (In the Friendly Sky) [Song]. On What's Going on.* Sony/ATV Music Publishing, LLC.
- George, K.M., Lutsey, P.L., Kucharska-Newton, A., Palta, P., Heiss, G., Osypuk, T., Folsom, A.R., 2020. Life-course individual and neighborhood socioeconomic status and risk of dementia in the atherosclerosis risk in communities neurocognitive study. *Am. J. Epidemiol.* 189 (10), 1134–1142. <https://doi.org/10.1093/aje/kwaa072>.
- George, K.M., Peterson, R.L., Gilsanz, P., Barnes, L.L., Mayeda, E.R., Glymour, M.M., Mungas, D.M., DeCarli, C.S., Whitmer, R.A., 2021. Stroke belt birth state and late-life cognition in the study of healthy aging in African Americans (STAR). *Ann. Epidemiol.* 64, 26–32. <https://doi.org/10.1016/j.annepidem.2021.09.001>.
- George, K.M., Maillard, P., Gilsanz, P., Fletcher, E., Peterson, R.L., Fong, J., Mayeda, E.R., Mungas, D.M., Barnes, L.L., Glymour, M.M., DeCarli, C., Whitmer, R.A., 2023. Association of early adulthood hypertension and blood pressure change with late-life neuroimaging biomarkers. *JAMA Netw. Open* 6 (4), e236431. <https://doi.org/10.1001/jamanetworkopen.2023.6431>.
- Geronimus, A.T., Hicken, M., Keene, D., Bound, J., 2006. "Weathering" and age patterns of allostatic load scores among blacks and whites in the United States. *Am. J. Publ. Health* 96 (5), 826–833. <https://doi.org/10.2105/AJPH.2004.060749>.
- Glymour, M.M., Manly, J.J., 2008. Lifecourse social conditions and racial and ethnic patterns of cognitive aging. *Neuropsychol. Rev.* 18 (3), 223–254. <https://doi.org/10.1007/s11065-008-9064-z>.
- Graf, G.H., Crowe, C.L., Kothari, M., Kwon, D., Manly, J.J., Turney, I.C., Valeri, L., Belsky, D.W., 2022. Testing black-white disparities in biological aging among older adults in the United States: analysis of DNA-methylation and blood-chemistry methods. *Am. J. Epidemiol.* 191 (4), 613–625. <https://doi.org/10.1093/aje/kwab281>.
- Green, D.P., Glaser, J., Rich, A., 1998. From lynching to gay bashing: the elusive connection between economic conditions and hate crime. *J. Pers. Soc. Psychol.* 75 (1), 82–92. <https://doi.org/10.1037/0022-3514.75.1.82>.
- Guidi, J., Lucente, M., Sonino, N., Fava, G.A., 2021. Allostatic load and its impact on health: a systematic review. *Psychother. Psychosom.* 90 (1), 11–27. <https://doi.org/10.1159/000510696>.
- Gutierrez, J., Guzman, V., Khasiyev, F., Manly, J., Schupf, N., Andrews, H., Mayeux, R., Brickman, A.M., 2019. Brain arterial dilatation and the risk of Alzheimer's disease. *Alzheimer's Dementia : J. Alzheimer's Assoc.* 15 (5), 666–674. <https://doi.org/10.1016/j.jalz.2018.12.018>.
- Harrell, S.P., 2000. A multidimensional conceptualization of racism-related stress: implications for the well-being of people of color. *Am. J. Orthopsychiatry* 70 (1), 42–57. <https://doi.org/10.1037/h0087722>.
- Henderson, K., Powers, S., Claibourn, M., Brown-Iannuzzi, J.L., Trawalter, S., 2021. Confederate monuments and the history of lynching in the American South: an empirical examination. *Proc. Natl. Acad. Sci. U. S. A.* 118 (42), e2103519118. <https://doi.org/10.1073/pnas.2103519118>.
- Himmelstein, K.E.W., Lawrence, J.A., Jahn, J.L., Ceasar, J.N., Morse, M., Bassett, M.T., Wispelwey, B.P., Darity Jr., W.A., Venkataramani, A.S., 2022. Association between racial wealth inequities and racial disparities in longevity among US adults and role of reparations payments, 1992 to 2018. *JAMA Netw. Open* 5 (11), e2240519. <https://doi.org/10.1001/jamanetworkopen.2022.40519>.
- History.com (Ed.), 2009a. *Founding of the Ku Klux Klan.* The History Channel Website. Retrieved. <https://www.history.com/topics/19th-century/ku-klux-klan>. (Accessed 17 February 2024).
- History.com (Ed.), 2009b. *This Day in History.* The History Channel Website. Retrieved. <https://www.history.com/this-day-in-history/subway-vigilante-turns-himself-in>. (Accessed 18 February 2024).
- Hughes, K., Bellis, M.A., Hardcastle, K.A., Sethi, D., Butchart, A., Mikton, C., Jones, L., Dunne, M.P., 2017. The effect of multiple adverse childhood experiences on health: a

- systematic review and meta-analysis. *Lancet Public Health* 2 (8), e356–e366. [https://doi.org/10.1016/S2468-2667\(17\)30118-4](https://doi.org/10.1016/S2468-2667(17)30118-4).
- Jacobs, D., Malone, C., Iles, G., 2012. Race and imprisonments: vigilante violence, minority threat, and racial politics. *Socio. Q.* 53 (2), 166–187. <https://doi.org/10.1111/j.1533-8525.2012.01230.x>.
- Karas Montez, J., Hayward, M.D., Zajacova, A., 2019. Educational disparities in adult health: U.S. States as institutional actors on the association. *Socius : Sociol. Res. Dyn. World* 5. <https://doi.org/10.1177/2378023119835345>, 10.1177/2378023119835345.
- Kihlström, L., Kirby, R.S., 2021. We carry history within us: anti-Black racism and the legacy of lynchings on life expectancy in the U.S. South. *Health Place* 70, 102618. <https://doi.org/10.1016/j.healthplace.2021.102618>.
- Kim, J.K., Faul, J., Weir, D.R., Crimmins, E.M., 2024. Dried blood spot based biomarkers in the Health and Retirement Study: 2006 to 2016. *Am. J. Hum. Biol. : Off. J. Hum. Biol. Council* 36 (2), e23997. <https://doi.org/10.1002/ajhb.23997>.
- Krieger, N., 2016. Living and dying at the crossroads: racism, embodiment, and why theory is essential for a public health of consequence. *Am. J. Publ. Health* 106 (5), 832–833. <https://doi.org/10.2105/AJPH.2016.303100>.
- Lamar, M., Lerner, A.J., James, B.D., Yu, L., Glover, C.M., Wilson, R.S., Barnes, L.L., 2020. Relationship of early-life residence and educational experience to level and change in cognitive functioning: results of the minority aging research study. *J. Gerontol. B Psychol. Sci. Soc. Sci.* 75 (7), e81–e92. <https://doi.org/10.1093/geronb/gbz031>.
- Langa, K.M., Plassman, B.L., Wallace, R.B., Herzog, A.R., Heeringa, S.G., Ofstedal, M.B., Burke, J.R., Fisher, G.G., Fultz, N.H., Hurd, M.D., Potter, G.G., Rodgers, W.L., Steffens, D.C., Weir, D.R., Willis, R.J., 2005. The aging, demographics, and memory study: study design and methods. *Neuroepidemiology* 25 (4), 181–191. <https://doi.org/10.1159/000087448>.
- Lavretsky, H., Newhouse, P.A., 2012. Stress, inflammation, and aging. *Am. J. Geriatr. Psychiatr. : Off. J. Am. Assoc. Geriatr. Psychiatr.* 20 (9), 729–733. <https://doi.org/10.1097/JGP.0b013e31826573cf>.
- Libby, P., 2007. Inflammatory mechanisms: the molecular basis of inflammation and disease. *Nutr. Rev.* 65 (12 Pt 2), S140–S146. <https://doi.org/10.1111/j.1753-4887.2007.tb00352.x>.
- Liu, S.H., Juster, R.P., Dams-O'Connor, K., Spicer, J., 2020. Allostatic load scoring using item response theory. *Comprehensive Psychoneuroendocrinol.* 5, 100025. <https://doi.org/10.1016/j.cpnec.2020.100025>.
- Lowry, E., McInerney, A., Schmitz, N., Deschênes, S.S., 2022. Adverse childhood experiences and cognitive function in adulthood: examining the roles of depressive symptoms and inflammation in a prospective cohort study. *Soc. Psychiatr. Psychiatr. Epidemiol.* 57 (12), 2367–2377. <https://doi.org/10.1007/s00127-022-02315-w>.
- Manly, J.J., Jones, R.N., Langa, K.M., Ryan, L.H., Levine, D.A., McCammon, R., Heeringa, S.G., Weir, D., 2022. Estimating the prevalence of dementia and mild cognitive impairment in the US: the 2016 health and retirement study harmonized cognitive assessment protocol project. *JAMA Neurol.* 79 (12), 1242–1249. <https://doi.org/10.1001/jamaneurol.2022.3543>.
- Mitchell, U.A., Dellor, E.D., Sharif, M.Z., Brown, L.L., Torres, J.M., Nguyen, A.W., 2020. When is hope enough? Hopefulness, discrimination and racial/ethnic disparities in allostatic load. *Behav. Med.* 46 (3–4), 189–201. <https://doi.org/10.1080/08964289.2020.1729086>.
- Mobley, T., 2021. Ida B. Wells-Barnett: anti-lynching and the White House. WHHA (en-US). Retrieved <https://www.whitehousehistory.org/ida-b-wells-barnett-anti-lynching-and-the-white-house>. (Accessed 15 March 2024).
- Monaco, J., 2009. *How to Read a Film: Movies, Media, and beyond*, fourth ed. Oxford University Press, Oxford, United Kingdom.
- National Archives, 2017. African Americans and the American labor movement. National Archives Retrieved 1997. <https://www.archives.gov/publications/prologue/1997/summer/american-labor-movement.html>; (Accessed 7 April 2024), 29.
- n.d., 1902. Pardoned by the governor. *The Weekly Advertiser*.
- n.d., 1904. The Statesboro lynching. *Atlanta J. Rec. Med.* 6 (6), 382–383.
- n.d., 1906. Castration instead of lynching. *Atlanta J. Rec. Med.* 8 (7), 456–458.
- n.d., 1947. Make lynching a federal offense. *J. Natl. Med. Assoc.* 39 (4), 164.
- Neta, G., Brownson, R.C., Chambers, D.A., 2018. Opportunities for epidemiologists in implementation science: a primer. *Am. J. Epidemiol.* 187 (5), 899–910. <https://doi.org/10.1093/aje/kwx323>.
- Ngo, H., 2016. Racist habits: a phenomenological analysis of racism and the habitual body. *Philos. Soc. Critic.* 42 (9), 847–872. <https://doi.org/10.1177/0191453715623320>.
- Nunnally, S.C., 2012. 3. Being black in America: racial socialization. In: 3. Being Black in America: Racial Socialization. New York University Press, pp. 57–89. <https://doi.org/10.18574/nyu/9780814758656.003.0003>.
- Patterson, O., 1982. *Slavery and Social Death: A Comparative Study*. Harvard University Press.
- Peterson, R.L., George, K.M., Gilsanz, P., Mayeda, E.R., Glymour, M.M., Meyer, O.L., Mungas, D.M., DeCarli, C., Whitmer, R.A., 2021a. Lifecourse socioeconomic changes and late-life cognition in a cohort of U.S.-born and U.S. immigrants: findings from the KHANDLE study. *BMC Publ. Health* 21 (1), 920. <https://doi.org/10.1186/s12889-021-10976-6>.
- Peterson, R.L., George, K.M., Barnes, L.L., Gilsanz, P., Mayeda, E.R., Glymour, M.M., Mungas, D.M., Whitmer, R.A., 2021b. Association of timing of school desegregation in the United States with late-life cognition in the study of healthy aging in African Americans (STAR) cohort. *JAMA Netw. Open* 4 (10), e2129052. <https://doi.org/10.1001/jamanetworkopen.2021.29052>.
- Pohl, D.J., Seblova, D., Avila, J.F., Dorsman, K.A., Kulick, E.R., Casey, J.A., Manly, J., 2021. Relationship between residential segregation, later-life cognition, and incident dementia across race/ethnicity. *Int. J. Environ. Res. Publ. Health* 18 (21), 11233. <https://doi.org/10.3390/ijerph182111233>.
- Powell, W.R., Buckingham, W.R., Larson, J.L., Vilen, L., Yu, M., Salamat, M.S., Bendlin, B.B., Rissman, R.A., Kind, A.J.H., 2020. Association of neighborhood-level disadvantage with Alzheimer disease neuropathology. *JAMA Netw. Open* 3 (6), e207559. <https://doi.org/10.1001/jamanetworkopen.2020.7559>.
- Price, J.M., 2015. *Crossing the abyss: the study of social death*. In: *Prison and Social Death*. Rutgers University Press.
- Probst, J.C., Glover, S., Kirksey, V., 2019. Strange harvest: a cross-sectional ecological analysis of the association between historic lynching events and 2010–2014 county mortality rates. *J. Racial Ethnic Health Disparities* 6 (1), 143–152. <https://doi.org/10.1007/s40615-018-0509-7>.
- Ren, Z., Luo, Y., Zheng, X., Liu, J., 2023. Adverse childhood experiences from family and society contribute to increased risk of depressive symptoms and cognitive impairment: a cross-sectional study. *Gen. Psychiatr.* 36 (4), e101039. <https://doi.org/10.1136/gpsych-2023-101039>.
- Rigby, D., Seguin, C., 2018. The racial position of European immigrants 1883–1941: evidence from lynching in the midwest. *Soc. Curr.* 5 (5), 438–457. <https://doi.org/10.1177/2329496518780921>.
- Rigby, D., Seguin, C., 2021. Capital punishment and the legacies of slavery and lynching in the United States. *Ann. Am. Acad. Polit. Soc. Sci.* 694 (1), 205–219. <https://doi.org/10.1177/0002716221101>.
- Roberts, A.L., Zafonte, R., Chibnik, L.B., Baggish, A., Taylor, H., Baker, J., Whittington, A.J., Weisskopf, M.G., 2022. Association of adverse childhood experiences with poor neuropsychiatric health and dementia among former professional US football players. *JAMA Netw. Open* 5 (3), e223299. <https://doi.org/10.1001/jamanetworkopen.2022.3299>.
- Schickedanz, H.B., Jennings, L.A., Schickedanz, A., 2022. The association between adverse childhood experiences and positive dementia screen in American older adults. *J. Gen. Intern. Med.* 37 (10), 2398–2404. <https://doi.org/10.1007/s11606-021-07192-8>.
- Seguin, C., Rigby, D., 2019. National crimes: a New national data set of lynchings in the United States, 1883 to 1941. *Socius* 5, 2378023119841780. <https://doi.org/10.1177/2378023119841780>.
- Smångs, M., 2016. Doing violence, making race: southern lynching and white racial group formation. *AJS* 121 (5), 1329–1374. <https://doi.org/10.1086/684438>.
- Sonnega, A., Faul, J.D., Ofstedal, M.B., Langa, K.M., Phillips, J.W., Weir, D.R., 2014. Cohort profile: the health and retirement study (HRS). *Int. J. Epidemiol.* 43 (2), 576–585. <https://doi.org/10.1093/ije/dyu067>.
- Tejera, C.H., Ware, E., Hicken, M., Kobayashi, L., Wang, H., Adkins-Jackson, P., Blostein, F., Zawistowski, M., Mukherjee, B., Bakulski, K., 2023. The mediating role of systemic inflammation and moderating role of race/ethnicity in racialized disparities in incident dementia: a decomposition analysis. *Research Square*. <https://doi.org/10.21203/rs.3.rs-2753483/v1> rs.3.rs-2753483.
- The NAACP Website. (n.d.). History of Lynching in America. Retrieved April 7, 2024 from <https://naacp.org/find-resources/history-explained/history-lynching-america>.
- Tuskegee University Archives Repository, 2020. Lynchings: by state and race, 1882–1968. Retrieved <https://archive.tuskegee.edu/repository/wp-content/uploads/2020/11/Lynchings-Stats-Year-Dates-Causes.pdf>. (Accessed 17 February 2024).
- Watson, K.T., Marie, T., Gentzis, E.-A., et al., 2024. Protect the children, body and soul. *Educ. Sci.* 14 (3), 282. <https://doi.org/10.3390/educsci14030282>.
- Wright, R., 1994. *Black Boy*. Harper Perennial Modern Classics, Massachusetts: USA.
- Zimmerman, M.A., Selzman, C.H., Cothren, C., Sorensen, A.C., Raeburn, C.D., Harken, A.H., 2003. Diagnostic implications of C-reactive protein. *Arch. Surg.* 138 (2), 220–224. <https://doi.org/10.1001/archsurg.138.2.220>. Chicago, Ill. : 1960.