

men and women of the same age better health and driving resources contribute to larger life space for elderly men.

EDUCATION, LITERACY, NUMERACY AND HEALTH INFORMATION SEEKING IN LATER LIFE

Takashi Yamashita,¹ Anthony R. Bardo,² Roberto J. Millar,¹ Shalini Sahoo,³ Phyllis Cummins,⁴ and Darren Liu⁵, 1. *University of Maryland, Baltimore County, Baltimore, Maryland, United States*, 2. *University of Kentucky, Lexington, Kentucky, United States*, 3. *University of Maryland, Baltimore, Baltimore, Maryland, United States*, 4. *Scripps Gerontology Center, Miami University, Oxford, Ohio, United States*, 5. *Des Moines University, Des Moines, Iowa, United States*

Health information plays a critical role for health promotion and maintenance in later life. While health information seeking is primarily driven by need (e.g., health), significantly less is known about the roles of education and health-literacy. Thus, we examine complex pathways that link health information seeking behaviors with education and health literacy (decomposed into general literacy and numeracy), and how these pathways differ by health status among a nationally representative sample of Americans age 50 and older ($n = 2,750$). Data come from the 2012/2014 Program for International Assessment of Adult Competencies. Multi-group structural equation models were used to examine the use of eight health information sources (newspapers, magazines, internet, radio, TV, books, friends/family, and health professionals) by health status (good vs. poor). Findings showed that literacy and numeracy are significant mediators of the relationship between education and health professional as an information source. Additionally, the mediation effects on health professionals by literacy status [indirect-effect (good vs. poor health) = 0.48 vs. 2.13, $p < 0.05$] and numeracy [indirect-effect (good vs. poor health) = -0.47 vs. -1.81, $p < 0.05$] were significantly moderated by health. At the same time, no moderated mediation effect was observed in the use of any other information sources. This study provides some of the first nationally representative evidence regarding how education functions through health literacy components to shape health information seeking behaviors by health status. Explanations and implications for differing effects of education, literacy, and numeracy on health information seeking in later life were evaluated.

RACE, BIOLOGICAL AGE, AND COGNITION: THE SYSTEMATIC ASSESSMENT OF GERIATRIC ELEMENTS IN ATRIAL FIBRILLATION STUDY

Sarah N. Forrester,¹ David D. McManus,¹ Jane S. Saczynski,² and Catarina I. Kiefe¹, 1. *University of Massachusetts Medical School, Worcester, Massachusetts, United States*, 2. *Northeastern University, Boston, Massachusetts, United States*

Atrial Fibrillation (AF) is associated with dementia and cognitive decline. AF is less prevalent among Blacks than Whites, although AF-related complications are more common in Blacks. In the general population, all-cause cognitive decline and dementia are more prevalent among Blacks than Whites. Thus, studying diverse populations with AF may advance our understanding of racial disparities in cognitive functioning. We created a measure of multisystem

dysregulation (weathering), which includes but is more encompassing than aging, and examined its association with racial differences in cognition using data from the SAGE-AF study, a prospective cohort of >65-year olds with AF, at high stroke risk, and eligible for anticoagulation. Biological (as opposed to chronological) age among 974 participants was calculated using the Klemera and Doubal method using biomarkers representing physiological functioning, metabolism, and blood pressure. We defined weathering as the difference between biological and chronological age (weathering >0 indicates that biological age is higher than chronological age). We measured the association between weathering and the Montreal Cognitive Assessment (MoCA) score. Mean weathering (SD) was -0.7 (11.5) and 4.3 (12.6) for whites and non-whites, respectively. There was an interaction between race/ethnicity and weathering on cognition ($P=0.004$). In stratified analyses, higher weathering was associated with a lower MoCA score among both Whites and non-Whites but more so among non-whites ($B = -0.09$, 95% CI: -0.17, -0.02) for Whites ($B = -0.03$, 95% CI: -0.06, -0.01) for non-whites. Aging-related multisystem dysregulation is more strongly associated with worse cognition in non-whites than in whites.

THE EDUCATION-HEALTH GRADIENT AND PATHWAYS TO MORTALITY

Justin J. Kiel,¹ Yenee Soh,¹ Muqi Guo,¹ and David Canning¹, 1. *Harvard T.H. Chan School of Public Health, Boston, Massachusetts, United States*

Large and widening educational gaps in life expectancy exist in the United States, but the mechanisms behind the education-health gradient are not well understood. We aim to study the different pathways of mortality by education group and decompose the life expectancy gap at age 50 into three components: differences in initial health at age 50, differences in transition rates to poor health states, and differences in mortality rates, given the health state. We use 11 waves of the Health and Retirement Survey and model the evolution of mortality, and health states (measured by self-rated health, limitation on any activity of daily living, and ever diagnosed with a range of health conditions). We estimate Markov models of transitions between health states and mortality over two year periods and use these transition matrices to simulate how a cohort's health changes as they age. We find a 6-year gap in life expectancy between the highest and lowest education groups. Initial health states account for one-third of the gap in life expectancy, primarily from differences in objective health measures. The gap has widened over time, explained by comparatively better health status changes for the higher educated group, compared to the other education groups. The lower education groups have high rates of transition to poor health states, but not differential mortality rates conditional on their health state. These results suggest that educational gaps in life expectancy are due to the onset of ill health at earlier ages, and not different mortality outcomes after disease diagnoses.

ASSOCIATIONS OF GENETICS AND LIFE COURSE CIRCUMSTANCES WITH A NOVEL AGING MEASURE THAT CAPTURES MORTALITY RISK

Zuyun Liu,¹ xi Chen,² Thomas M. Gill,³ Chao Ma,² Eileen Crimmins,⁴ and Morgan E. Levine³, 1. *Department*

of Pathology, Yale School of Medicine, New Haven, Connecticut, United States, 2. Department of Health Policy and Management, Yale School of Public Health Department of Economics Yale University, New Haven, Connecticut, United States, 3. Yale School of Medicine, New Haven, Connecticut, United States, 4. Davis School of Gerontology, University of Southern California, Los Angeles, California, United States

We aimed to evaluate associations between a comprehensive set of factors, including genetics and childhood and adulthood circumstances, and a novel aging measure, Phenotypic Age (PhenoAge), which has been shown to capture mortality and morbidity risk in the U.S. population. Using data from 2339 adults (aged 51+) from the U.S. Health and Retirement Study, we found that together all 11 study domains (4 childhood and adulthood circumstances domains, 5 polygenic scores [PGSs] domains, and 1 demographics, and 1 behaviors domains) accounted for about 30% of variance in PhenoAge after accounting for chronological age. Among the 4 circumstances domains, adulthood adversity was the largest contributor (9%), while adulthood socioeconomic status (SES), childhood adversity, and childhood SES accounted for 2.8%, 2.1%, 0.7%, respectively. All PGSs contributed 3.8% of variance in PhenoAge (after accounting for chronological age). Further, using Hierarchical Clustering, we identified 6 distinct subpopulations/clusters based on the 4 circumstances domains, and 3 subpopulations/clusters of them that appear to represent disadvantaged circumstances were associated with higher PhenoAge. Finally, there was a significant gene-by-environment interaction between a previously validated PGS for coronary artery disease and the most apparently disadvantaged subpopulation/cluster, suggesting a multiplicative effect of adverse life course circumstances coupled with genetic risk on phenotypic aging. We concluded that socioenvironmental circumstances during childhood and adulthood account for a sizable proportion of differences in phenotypic aging among U.S. older adults. The disadvantaged subpopulations exhibited accelerated aging and the detrimental effects may be further exacerbated among persons with genetic predisposition to coronary artery disease.

SOCIAL AND BEHAVIORAL FACTORS IN COGNITIVE AGING: APPLYING THE CAUSAL INFERENCE FRAMEWORK IN OBSERVATIONAL STUDIES

Anja K. Leist¹, 1. University of Luxembourg, Esch-sur-Alzette, Luxembourg

Rationale: There is an urgent need to better understand how to maintain cognitive functioning at older ages with social and behavioral interventions, given that there is currently no medical cure available to prevent, halt or reverse the progression of cognitive decline and dementia. However, in current models, it is still not well established which factors (e.g. education, BMI, physical activity, sleep, depression) matter most at which ages, and which behavioral profiles are most protective against cognitive decline. In the last years, advances in the fields of causal inference and machine learning have equipped epidemiology and social sciences with methods and models to approach causal questions in observational studies. Method: The presentation will give an overview of the causal inference framework and different machine learning approaches to

investigate cognitive aging. First, we will present relevant research questions on the role of social and behavioral factors in cognitive aging in observational studies. Second, we will introduce the causal inference framework and recent methods to visualize and compute the strength of causal paths. Third, promising machine learning approaches to arrive at robust predictions are presented. The 13-year follow-up from the European SHARE survey that employs well-established cognitive performance tests is used to demonstrate the usefulness of the approach. Discussion: The causal inference framework, combined with recent machine learning approaches and applied in observational studies, provides a robust alternative to intervention research. Advantages for investigations under the new framework, e.g., fewer ethical considerations compared to intervention research, as well as limitations are discussed.

SUBJECTIVE APPRAISALS OF PHYSICAL AND EMOTIONAL HEALTH: EXAMINING AGE DIFFERENCES ACROSS RURAL URBAN COMMUNITIES

Hillary Dorman,¹ Rebecca S. Allen,² Patricia A. Parmelee,² and Lisa C. McGuire³, 1. University of Alabama, Tuscaloosa, Tuscaloosa, Alabama, United States, 2. The University of Alabama, Tuscaloosa, Alabama, United States, 3. CDC, Atlanta, Georgia, United States

Using the Meikirch model as a theoretical underpinning, the present study aimed to examine population health disparities by discerning age variations within and across rural urban areas. Secondary data analysis was conducted using the CDC's 2017 Behavioral Risk Factor Surveillance System. The study's outcome variables included physical health and mental health burden (zero days, 1-13 days, 14+ days). A total sample of 96,568 adults were included with a mean age of 66.05 years (SD = 9.91). Individuals were classified in the following age groups: 43% middle-aged (45-64 years), 33% young-old (65-74 years), and 25% old-old adults (75+ years). The sample was largely female (61%), Non-Hispanic White (86%), and urban (67%). A series of chi-square tests of independence – post hoc tests when applicable – were completed. Overall, rural residents reported a higher prevalence of severe physical and mental health symptom burden. Regarding physical health burden, a significant difference was found within urban settings ($X^2(4) = 50.74, p < .001$), where, unexpectedly, young-old adults reported the best physical health. Regarding mental health burden, a significant difference was found for both urban ($X^2(4) = 1661.72, p < .001$) and rural settings ($X^2(4) = 820.65, p < .001$), with middle-aged adults reporting greater mental illness and the old-old adults reporting greater mental health resiliency. Findings suggest that a multidimensional framework of health usefully informs public health and clinical service interventions, identifying populations and locations in need (i.e., targeting rural physical health across age groups and mental health among the middle-age, regardless of location).

OCCUPATIONAL MOBILITY AND CHRONIC ILLNESS IN LATE LIFE: A SYSTEMATIC REVIEW

Rong Fu,¹ Kathleen Abrahamson,² and Tara Campbell¹, 1. Siena College, Loudonville, New York, United States, 2. Purdue University, West Lafayette, Indiana, United States