Subjective Social Status Predicts Late-Life Memory Trajectories through Both Mental and Physical Health Pathways

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Keywords

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Abstract

Background: Subjective social status (SSS) is associated with mental and physical health, independent of objective socioeconomic status (SES), but its association with late-life cognitive decline is unknown. **Objective:** This study characterizes the association between SSS and late-life memory trajectories in a large, nationally representative sample of older adults in the United States. **Methods:** Using data from 8,530 participants aged 65 years and older in the Health and Retirement Study, structural equation models tested associations between SSS, objective SES (i.e., educational attainment, occupation, income, and wealth), physical and mental health, and 6-year memory trajectories, controlling for sociodemographic characteristics. **Results:** Independent of objective SES, lower SSS was associated with worse initial memory but not subsequent memory decline. The association between SSS and initial memory was separately mediated by chronic diseases, stroke, and depressive symptoms. **Conclusion:** Results provide preliminary behavioral evidence for the deleterious effects of social stress on cognitive

aging. These results may help inform the development of policies and interventions to reduce cognitive morbidity among older adults who perceive a low position on the social hierarchy.

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Introduction

Socioeconomic status (SES), typically operationalized as educational attainment, occupation, income and/or wealth, consistently predicts a wide range of health outcomes [1]. Indeed, SES has been described as a fundamental cause of health because it provides individuals with a highly flexible set of material and nonmaterial resources that allow them to avoid health risks and accumulate health advantages over the life course [2, 3]. With regard to late-life cognitive health, higher SES has been linked to better initial cognition, slower subsequent cognitive decline, and lower risk of incident dementia [4–6].

Experimental evidence suggests that the psychological repercussions of perceived inequality have an even stronger adverse effect on health than objective socioeconomic resources [7]. Indeed, a growing body of research indi-

cates that, independent of objective SES, subjective social status (SSS) predicts a wide range of mental and physical health outcomes, including depression, cardiovascular disease, respiratory illness, diabetes, and mortality [8]. SSS has been described as a more comprehensive measure of one's social position than objective SES because it reflects an individual's "cognitive averaging" of multiple dimensions of SES as well as other status-related information, such as perceived control, feelings of financial security, and discrimination [9–12].

The subjective experience of occupying a low position in the social hierarchy represents a form of social stress, as SSS involves beliefs about future security and opportunity [13, 14]. Indeed, proposed physiological mechanisms underlying the relationship between SSS and health outcomes involve stress-related biological risk factors for disease, including higher resting heart rate, altered cortisol response, reduced immune defense, and elevated interleukin-6 [8]. Many of these biological risk factors, as well as their associated health conditions, are also known risk factors for late-life cognitive impairment [15, 16]. Further, lower SSS has been linked to more depressive symptoms [17] and smaller brain volumes [18], which are also known risk factors for late-life cognitive impairment [19, 20]. While very few studies have examined the association between SSS and cognition, preliminary findings in children suggest that SSS and objective indicators of SES are each independently and positively related to cognitive functioning [21]. Together, these findings provide the basis for our overarching hypothesis that SSS is positively associated with late-life cognition, as well as our additional hypothesis that this relationship is at least partially mediated by mental and physical health.

The current study examined the association between SSS and late-life cognition in a longitudinal structural equation modeling framework using 6 years of data from the Health and Retirement Study (HRS). Because the pathways linking SSS to cognition, particularly in older adults, have not yet been elucidated, this study also examined both physical and mental health mediators (i.e., chronic disease burden, stroke, and depressive symptoms), which have previously been linked to SSS [22].

Method

Participants

Data were drawn from the HRS, a nationally representative sample of Americans over 50 followed since 1992 [23]. Details of the HRS longitudinal panel design, sampling, and all assessment instruments are available on the HRS website (<http://hrsonline.isr>.

Table 1. Sample characteristics at baseline

Age, years ^a	72.7 (6.1)
Women, %	51.6
Race/ethnicity, %	
Non-Hispanic White	77.2
Non-Hispanic Black	13.5
Hispanic (any race)	7.5
Non-Hispanic Other	1.8
Education (scale 0–17)	12.2 (3.2)
Longest held occupation, %	
Professional	15.8
Managerial	13.7
Sales	9.6
Clerical and administrative	16.4
Service	14.1
Farming and fishing	3.4
Mechanical	11.3
Operator	14.8
Military	0.9
Income (thousands)	52.3 (117.3)
Wealth (thousands)	544.6 (1,424.3)
Subjective social status (scale 1–10)	6.7 (1.7)
Chronic disease burden (scale 0–6)	2.0 (1.2)
Stroke (yes), %	10.2
Depressive symptoms (scale 0–8)	1.4 (1.9)
Immediate recall (scale 0–10)	5.2 (1.7)
Delayed recall (scale 0–10)	4.0 (2.0)

Values are means (standard deviations) unless otherwise indicated. ^a Age range was 65–101 years.

umich.edu). Participants in the HRS are interviewed every 2 years. The current study included HRS participants who were aged 65 years or older at the time of the 2006 assessment wave. The 2006 assessment wave served as the baseline occasion in this study because this wave was the first in which the complete psychosocial leave-behind questionnaire, including the measure of SSS described below, was administered to a large proportion of HRS participants. Characteristics of the 8,530 individuals included in the current study are provided in Table 1. All participants provided written informed consent, and all study procedures were approved by the University of Michigan institutional review board.

Measures

Memory

Cognitive functioning was assessed during the core HRS telephone interview using brief measures of episodic memory and global mental status. Episodic memory was used as the cognitive outcome in this study because it is highly sensitive to age-related cognitive decline and early dementia [24]. In the assessment of episodic memory, participants hear a list of 10 words, and they are asked to recall the words immediately and following a 5-min delay. To improve reliability of the memory outcome in the current study, raw scores on immediate and delayed recall trials were combined into a z-score composite using the means and standard deviations from the baseline (2006) assessment wave.

Objective SES

Objective SES was operationalized as 4 separate variables: education, occupation, income, and wealth. Education was self-reported years of education (0–17). Income was total household income from all queried sources (e.g., respondent and spouse earnings, pensions, social security) for the last calendar year at the time of the 2006 wave. Because many participants were no longer working, occupation was operationalized as the occupational group for the job with the longest reported tenure. The original 17 HRS occupation categories were collapsed into the following 9 categories: professional and technical support (reference category); managerial; sales; clerical and administrative support; mechanical, construction, and precision production; service (private household services, protective services, food preparation, health service, and personal service); operators, fabricators, and laborers; farming, forestry, and fishing; and military [25]. Wealth was the net value of total wealth (including second home) at the time of the 2006 wave and was calculated as the sum of assets (e.g., real estate, vehicles, bank accounts, and stocks) minus debts (e.g., mortgages, other loans) from all queried sources.

Subjective Social Status

SSS was assessed with the MacArthur Scale of Subjective Social Status, administered as part of a leave-behind questionnaire during the 2006 wave. Participants are shown a picture of a 10-rung ladder representing “where people stand in our society” and asked to “mark an X on the rung on the ladder” where they would place themselves. Scores range from 1 to 10, with higher scores corresponding to higher SSS. Previous work has provided strong evidence for the construct validity of this scale across various populations, including older adults [26].

Physical Health

Physical health was assessed during the core HRS telephone interview in 2006 with self-reported chronic diseases and stroke. Chronic disease burden was quantified as the sum of the self-reported presence/absence of the following 6 chronic conditions: hypertension, diabetes, cancer, lung disease, heart problems, and arthritis. Stroke was quantified as a dichotomous variable, and absence of self-reported stroke was the reference category.

Depressive Symptoms

Depressive symptoms over the past week were assessed during the core HRS telephone interview in 2006 with 8 items from the Center for Epidemiologic Studies Depression scale (CES-D) [27], which were modified into a yes/no format. Higher scores correspond to more depressive symptoms.

Analytic Strategy

Descriptive statistics were computed in SPSS. All analyses were controlled for objective SES indicators and the following covariates: age, gender, and race/ethnicity. Age (in years) corresponded to age at the time of the 2006 assessment wave. Gender was quantified as a dichotomous variable, and male was the reference category. Self-reported race/ethnicity was dummy-coded into 4 categories: non-Hispanic White, non-Hispanic Black, Hispanic (of any race), and non-Hispanic other. The largest category, non-Hispanic White, was treated as the reference group.

Predictors of SSS were estimated within an initial structural equation model (SEM), modeled in Mplus version 8. This initial

SEM estimated the association between SSS and memory trajectories, independent of objective SES indicators and all covariates. Memory trajectories from 2006 to 2012 were modeled as a latent growth curve and estimated with maximum likelihood. Time was parameterized as years from the 2006 assessment wave. In the current sample, participants had an average of 3.2 (standard deviation 1.2) time points of cognitive data between 2006 and 2012. Specifically, 7,990 (94%), 7,171 (84%), 6,222 (73%), and 5,668 (66%) participants had available memory scores in 2006, 2008, 2010, and 2012, respectively. By design, the leave-behind survey assessing SSS was only administered to a random subset of HRS participants (3,365 participants in the current study). Missing data were managed with full information maximum likelihood using all available data at each occasion. Sensitivity analyses restricted to the subset of 3,365 participants with available SSS data were conducted to confirm the appropriateness of this missing data procedure.

The model estimated the following latent variables: initial memory level (intercept) and subsequent rate of change in memory over the 6-year follow-up (linear slope). Memory intercept and slope were regressed onto SSS, objective SES indicators, and all covariates. SSS was regressed onto the objective SES indicators and all covariates. In addition to estimating the independent effects of objective SES and SSS on memory trajectories, this model also examined the extent to which SSS mediated effects of objective SES.

The final SEM estimated direct and indirect effects of SSS on memory trajectories through the mental and physical health variables of interest: chronic disease burden, stroke, and depressive symptoms. Direct effects reflect associations between SSS and memory that are independent of these variables, objective SES, and all covariates. Indirect effects reflect the product of all regression coefficients within a given pathway from SSS to memory (through chronic disease burden, stroke, and/or depressive symptoms), independent of objective SES and all covariates. As depicted in Figure 1, memory intercept and slope were regressed onto all predictors of interest and covariates. In addition, depressive symptoms were regressed onto stroke, chronic disease burden, SSS, and all covariates. Stroke was regressed onto chronic disease burden, SSS, and all covariates. Chronic disease burden was regressed onto SSS and all covariates.

Fit of each model was evaluated with the following commonly used indices: comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). CFI > 0.95, TLI > 0.95, RMSEA < 0.06, and SRMR < 0.05 were used as criteria for adequate model fit [28].

Results

Demographic and SES Predictors of SSS

The initial SEM, which did not include the potential mediators (i.e., chronic disease burden, stroke, depressive symptoms) fitted very well: CFI = 0.992; TLI = 0.982; RMSEA = 0.018 (90% CI 0.014–0.021); and SRMR = 0.005. Lower SSS was most strongly predicted by lower

Fig. 1. Schematic of all paths estimated in the final structural equation model. For simplicity, covariates (i.e., age, gender, and race/ethnicity) are not shown.

education (standardized estimate = 0.244; standard error [SE] = 0.020; $p < 0.001$), followed by less wealth (standardized estimate = 0.199; SE = 0.019; $p < 0.001$), working as an operator, fabricator, or laborer (standardized estimate = -0.113; SE = 0.023; $p < 0.001$), working in the service industry (standardized estimate = -0.108; SE = 0.023; $p < 0.001$), female gender (standardized estimate = -0.054; SE = 0.018; $p = 0.002$), working in farming, forestry, or fishing (standardized estimate = -0.046; SE = 0.018; $p = 0.012$), Black race (standardized estimate = -0.044; SE = 0.018; $p = 0.013$), lower income (standardized estimate = 0.042; SE = 0.014; $p = 0.002$), and younger baseline age (standardized estimate = 0.042; SE = 0.016; $p = 0.009$). Together, the demographic and objective SES variables explained 20.4% of the variance in SSS.

In a sensitivity analysis restricted to participants with available SSS data, the demographic and objective SES variables explained 18.4% of the variance in SSS, and the significant predictors of SSS were identical.

Effects of SSS versus Objective SES Indicators on Memory Trajectories

Initial Memory

Three of the four objective SES indicators were significantly and independently associated with initial

memory. Higher education showed the largest association (standardized estimate = 0.312; SE = 0.016; $p < 0.001$), followed by working as an operator, fabricator, or laborer (standardized estimate = -0.067; SE = 0.018; $p < 0.001$), working in the service industry (standardized estimate = -0.055; SE = 0.017; $p = 0.001$), working in mechanical, construction, or precision production (standardized estimate = -0.047; SE = 0.016; $p = 0.003$), and income (standardized estimate = 0.045; SE = 0.013; $p < 0.001$). Participants who reported a military career as their longest-lasting job showed better initial memory than the reference category of professional or technical workers (standardized estimate = 0.028; SE = 0.012; $p = 0.020$). Wealth was not independently associated with initial memory (standardized estimate = 0.020; SE = 0.014; $p = 0.163$).

In addition to associations between objective SES and initial memory that were independent of SSS, there were additional, independent indirect effects of objective SES on initial memory through SSS. Specifically, SSS partially mediated the positive association between education and initial memory (standardized estimate = 0.014; SE = 0.005; $p = 0.010$), partially mediated the positive association between income and initial memory (standardized estimate = 0.002; SE = 0.001; $p = 0.046$), and fully medi-

ated the positive association between wealth and initial memory (standardized estimate = 0.011; SE = 0.004; $p = 0.010$). With regard to occupation, SSS partially mediated negative associations between working in the service industry and initial memory (standardized estimate = -0.006; SE = 0.003; $p = 0.021$), as well as between working as an operator, fabricator, or laborer and initial memory (standardized estimate = -0.006; SE = 0.003; $p = 0.019$). For all of these indirect effects, lower objective SES was associated with lower SSS. In turn, lower SSS was associated with lower initial memory.

Independent of the objective SES indicators and covariates, lower SSS was associated with worse initial memory (standardized estimate = 0.057; SE = 0.021; $p = 0.008$). The magnitude of this association was numerically smaller than the association between education and initial memory, but comparable to associations between occupation and initial memory, and larger than associations involving income or wealth.

In a sensitivity analysis restricted to participants with available SSS data, SSS was significantly associated with initial memory independent of objective SES and all covariates (standardized estimate = 0.053; SE = 0.020; $p = 0.010$).

Rate of Memory Change

Even after accounting for objective SES, SSS, and covariates, memory scores declined over the 6-year follow-up period (standardized estimate = -0.811; SE = 0.378; $p = 0.032$). Of the 4 objective SES indicators, only occupation was associated with rate of memory change. Specifically, participants working in clerical or administrative support occupations (standardized estimate = -0.128; SE = 0.058; $p = 0.027$) or sales (standardized estimate = -0.124; SE = 0.054; $p = 0.021$) showed faster decline than participants working in professional or technical occupations. SSS did not mediate any association between objective SES and rate of memory change. SSS was not significantly associated with subsequent rate of memory decline in the whole sample (standardized estimate = 0.003; SE = 0.072; $p = 0.962$) or in the subset of participants with available SSS data (standardized estimate = 0.010; SE = 0.058; $p = 0.866$).

Direct and Indirect Effects of SSS on Initial Memory Level

Number of chronic conditions, history of stroke, and depressive symptoms were added to the model to investigate mediators of the significant association between SSS and initial memory level. This model (Fig. 1) fitted

Table 2. Standardized direct and indirect effects of subjective social status on initial memory level

Variables	Estimate (SE)	p
Direct effect	0.028 (0.021)	0.187
Specific indirect effects		
Chronic diseases	0.004 (0.001)	0.005
Stroke	0.004 (0.002)	0.029
Depressive symptoms	0.022 (0.003)	<0.001
Chronic diseases, stroke	0.001 (0.000)	<0.001
Chronic diseases, depressive symptoms	0.002 (0.000)	<0.001
Stroke, depressive symptoms	0.000 (0.000)	0.034
Chronic diseases, stroke, depressive symptoms	0.000 (0.000)	0.005

SE, standard error.

very well: CFI = 0.994; TLI = 0.978; RMSEA = 0.016 (90% CI 0.013–0.019); and SRMR = 0.005.

As shown in Table 2, all indirect pathways from SSS to initial memory through the mental and physical health variables were significant. The largest indirect effect was the single-mediator path through depressive symptoms. Independent of objective SES, physical health, and all covariates, lower SSS predicted more depressive symptoms (standardized estimate = -0.216; SE = 0.018; $p < 0.001$), and more depressive symptoms predicted lower initial memory (standardized estimate = -0.103; SE = 0.013; $p < 0.001$).

There were also significant indirect pathways from SSS to initial memory through the physical health variables. Specifically, lower SSS predicted more chronic diseases (standardized estimate = -0.082; SE = 0.019; $p < 0.001$), and more chronic diseases predicted lower initial memory (standardized estimate = -0.043; SE = 0.012; $p < 0.001$). Independently, lower SSS also predicted a history of stroke (standardized estimate = -0.045; SE = 0.020; $p = 0.023$), and a history of stroke predicted lower initial memory (standardized estimate = -0.089; SE = 0.012; $p < 0.001$).

In addition to these independent single-mediator paths from low SSS to lower initial memory through chronic diseases, stroke, or depressive symptoms, there were also significant multiple-mediator paths through these variables. This is because more chronic diseases predicted both a history of stroke (standardized estimate = 0.139; SE = 0.011; $p < 0.001$) and more depressive symptoms (standardized estimate = 0.178; SE = 0.011;

$p < 0.001$), and a history of stroke predicted more depressive symptoms (standardized estimate = 0.051; SE = 0.011; $p < 0.001$) independent of the number of chronic diseases. In turn, more chronic diseases, stroke, and depressive symptoms each independently predicted lower initial memory (estimates provided above). The direct pathway from SSS to initial memory level independent of all indirect paths was not significant (Table 2), indicating that the 7 indirect paths were sufficient to explain the effect of SSS.

A sensitivity analysis restricted to participants with available SSS data revealed an identical pattern of indirect effects of SSS on initial memory through depressive symptoms and chronic disease burden. However, there were no significant indirect effects of SSS on initial memory through stroke that did not also involve chronic disease burden because SSS was not independently associated with stroke in this subset of participants (standardized estimate = -0.036; SE = 0.019; $p = 0.057$). This difference may reflect the lower prevalence of stroke in the subgroup with available data on SSS (9.7 vs. 12.5%; $\chi^2(1) = 11.595$; $p = 0.001$).

Moderation by Sociodemographics

Additional models were run in the subset of participants with available SSS data to explore whether any of the direct or indirect effects of SSS on initial memory were moderated by sociodemographics (i.e., age, gender, and race/ethnicity). Moderated mediation was identified for gender and race. Specifically, the positive indirect effect of SSS on initial memory through depressive symptoms differed across gender because SSS was more strongly negatively associated with depressive symptoms among women (interaction $p = 0.018$). In contrast, the positive indirect effect of SSS on initial memory through stroke differed by gender because SSS was more strongly associated with stroke among men (interaction $p = 0.005$). In addition, the positive indirect effect of SSS on initial memory through depressive symptoms differed across race because depressive symptoms were more strongly negatively associated with initial memory among Black participants (interaction $p = 0.032$). The positive indirect effect of SSS on initial memory through chronic diseases also differed across race because SSS was more strongly negatively associated with chronic disease burden among White participants (interaction $p = 0.004$).

Alternative Model Specifications

Additional models were run to probe the temporal order of associations involving SSS and the mediators,

which were all measured in 2006 in the primary models. First, we re-ran the model depicted in Figure 1, changing only the direction of the association between SSS and depressive symptoms. By definition, the fit of this model was identical to that of the original model. While this model did not include the indirect effect identified as the largest indirect effect in the original mediation model (i.e., the single-mediator path from SSS to initial memory through depressive symptoms), it still revealed a significant total indirect effect of SSS on initial memory through the other pathways (standardized estimate = 0.006; SE = 0.003; $p = 0.020$).

Next, we re-ran the mediation model using mediators measured in 2008 and memory trajectories measured from 2008 to 2012. Due to insufficient variance in memory slope over this more limited follow-up period, this model specified no slope variance. The pattern of indirect effects from SSS to initial memory in this model was very similar to that summarized in Table 2. That is, all indirect effects remained statistically significant with 1 exception. The single-mediator path through chronic disease burden was not significant due to a nonsignificant association between chronic disease burden and initial memory. SSS measured in 2006 was significantly associated with all 3 mediators measured in 2008.

Longitudinal Changes in SSS

While the primary aim of this study was to examine the predictive association between SSS and subsequent memory trajectories, an additional analysis was conducted to examine potential changes in SSS in this older adult sample. Specifically, a latent growth curve model adjusted only for baseline age indicated that SSS scores were stable over the study period (standardized slope estimate = 0.218; SE = 0.489; $p = 0.656$).

Discussion

This longitudinal study provides evidence that SSS is positively associated with late-life episodic memory functioning, independent of common objective SES indicators (i.e., educational attainment, occupation, income, and wealth). While SSS was significantly predicted by all 4 objective SES indicators, together they explained only a small fraction of the variance in SSS. Mediation analyses revealed multiple, independent pathways from SSS to initial memory level through both physical health (i.e., number of chronic diseases, stroke) and mental health (i.e., depressive symptoms). Together, these results suggest

that the subjective perception of having low social status may be deleterious for older adults' physical, mental, and cognitive health, irrespective of their objective socioeconomic resources.

This study confirmed previous research demonstrating the nonequivalence of objective and subjective measures of SES [8]. Specifically, the objective SES indicators examined in this study (i.e., educational attainment, occupation, income, and wealth) failed to explain all of the variance in SSS. Younger, Black, and female participants also reported lower SSS, independent of the objective SES indicators. Together, these demographic and SES variables explained only one-fifth of the variance in SSS. Subjective perception of one's social standing may also be influenced by modifiable factors, such as perceived control (e.g., self-efficacy, environmental constraints), feelings of financial security, and experiences of discrimination [9–12]. Additional research is needed to fully characterize the determinants of SSS, particularly in older adults, as the current study suggests that SSS is relevant for late-life physical, mental, and cognitive outcomes. It is also notable that SSS at least partially mediated all associations between the objective SES indicators and initial memory, supporting subjective perception as 1 pathway by which SES influences health and further highlighting the importance of SSS for health.

Of the physical and mental health pathways from SSS to episodic memory examined in this study, a single-mediator path through depressive symptoms was the most prominent. This finding is in line with the view that psychological factors represent an important corollary of social position [14, 29]. Substantial observation data are available to support a cross-sectional, inverse association between SSS and depressive symptoms [10, 30, 31]. Prospective, longitudinal work further suggests that lower SSS drives subsequent depressive symptoms [17]. Recently, experimental work has emerged to support the view that subjective perception of one's social standing causally contributes to depressive symptomatology by promoting depressive cognitions and rumination [32]. Together, these results suggest that interrupting the pathway from SSS to depressive symptoms may also be beneficial for late-life cognitive health. Preliminary results from models exploring moderation by sociodemographics further imply that this pathway is particularly salient for women, who showed a stronger link between SSS and depressive symptoms, and Black older adults, who showed a stronger link between depressive symptoms and initial memory.

The finding that not all indirect paths from SSS to memory involved depressive symptoms indicates that targeting depressive symptoms is unlikely to fully eliminate the negative physical and cognitive health impacts of low SSS. Indirect effects of SSS on initial memory through physical health variables (i.e., chronic disease burden and stroke) are in line with a growing body of observational and experimental evidence that low SSS elevates multiple biological risk factors for disease, including higher resting heart rate, higher blood pressure, reduced beta adrenergic receptor function, higher body mass index, altered cortisol responses, angina, reduced immune defense, lower high-density lipoprotein cholesterol, impaired glucose tolerance, and elevated interleukin-6 [8, 33, 34]. It should be noted that the self-reported physical health variables used in this study are unlikely to fully capture all of the stress-related biological risk factors that have been linked to low SSS. Therefore, additional work is needed to fully characterize the physiological pathways linking SSS to late-life cognition. Preliminary results from models exploring moderation by sociodemographics further imply that these pathways may be particularly salient for men, who showed a stronger link between SSS and stroke, and non-Hispanic White older adults, who showed a stronger link between SSS and chronic disease burden.

The current finding that SSS was positively associated with episodic memory in late life indicates that SSS and/or its modifiable determinants may represent novel targets for the prevention of cognitive morbidity among older adults. Because SSS was only associated with initial memory, not with subsequent rate of memory change, it is unlikely that targeting SSS would slow cognitive aging. While it cannot be definitely ruled out that the association between SSS and initial memory reflects reverse causation, the finding that SSS remained stable over the course of the study despite significant memory decline makes it unlikely that SSS is sensitive to age-related memory decline. Still, it is possible that premorbid individual differences in memory ability influence SSS, even if age-related changes in memory do not. Of note, evidence for the within-person stability of SSS in this older adult sample suggests that the association between younger baseline age and lower SSS reflects cohort differences and/or selection, rather than age differences per se.

Limitations of this study include the lack of information on early-life cognition and the use of self-reported health measures. The HRS only includes the US ladder measure, in which participants rate their social status in relation to a distal referent group. It is unclear whether

the association between SSS and late-life cognition would differ if SSS were measured in relation to a proximal referent group (e.g., one's community). Evidence from previous studies comparing the health relevance of SSS rated in reference to the US versus one's community is conflicting [17, 22]. Strengths of this study include its large, nationally representative sample of older adults who varied in both objective SES and SSS. The availability of longitudinal cognitive data also provided a more reliable measure of episodic memory and allowed for separate evaluation of associations involving initial memory versus memory decline. In addition, sensitivity analyses supported the a priori temporal ordering of the variables of interest. Finally, consideration of mental and physical health mediators provides additional information regarding pathways from SSS to late-life cognitive health that can guide future work.

The findings of this study extend our understanding of the social gradient in health and highlight the prominence of psychosocial factors in shaping that gradient. Self-rated social status may offer clinicians additional predictive information on risk for late-life cognitive morbidity. It may also point to potential targets for the prevention of cognitive morbidity among older adults.

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