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Relational Social Class, Self-Rated Health, and Mortality in the United States

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Abstract

Applying a relational class theory based on property ownership, authority, and credentials/skill, we analyzed the relationship between class, self-rated health (SRH), and mortality using the 1972–2016 General Social Survey. In a simple measure of class, we assigned respondents to worker, manager, petty bourgeois, or capitalist classes. In a complex measure, we subdivided workers (less-skilled/more-skilled), managers (low/high), and capitalists (small/large). Next, we estimated trends in class structure. Finally, after gender-stratification, we estimated the relationships between class, SRH, and mortality and, in sensitivity analyses, tested for class-by-race interaction. Class structure changed little over time, with workers constituting over half the population each decade. Concerning SRH, for the simple measure, managers, petty bourgeoisie, and capitalists reported better health than workers. For the complex measure, patterns were similar, although skilled workers reported better health than less-skilled workers, low managers, and petty bourgeoisie. Concerning mortality, for the simple measure, inequities were small among women; among men, only capitalists' hazard was lower than workers' hazard. For the complex measure, across genders, the hazards of less-skilled workers and petty bourgeoisie were highest, while skilled workers' hazard resembled that of managers and capitalists. Finally, we found some evidence that the relationship between class and mortality varied by race, although the estimates were imprecise.

Keywords

social class, neo-Marxist, health inequities, epidemiology

Introduction

Since the industrial revolution, public-health researchers have documented morbidity and mortality inequities across social classes and socioeconomic positions in capitalist societies. As far back as the 1840s, Frederick Engels demonstrated that members of the burgeoning working class in Manchester, England, suffered greater rates of illness and death than their wealthier, propertied counterparts due to hazardous working and living conditions, a phenomenon Engels described as "social murder."[1] From Engels's observations onward, much social-science research has documented disparities in morbidity and mortality across intersecting axes of status, power, and privilege. But for most of the 20th and 21st centuries, this research eschewed analyses of social relations, instead prioritizing stratificationist approaches that treat social position as an individual-level attribute. Nonetheless, a small tradition of relational class approaches, which treat social position as deriving from social processes, has revealed patterns of morbidity and mortality across classes that are difficult to detect or explain with stratificationist approaches.[2] However, to our knowledge, no recent U.S.-based research has applied a relational approach to examining social-class inequities in 2 important indicators of population health: self-rated health (SRH) and mortality.

The present study fills that gap. Drawing on data from the 1972–2016 General Social Survey (GSS), we apply a relational, neo-Marxist theory of social class based on property ownership, managerial authority, and credentials/skill to analyze the association between class, SRH, and mortality in the United States. In the

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rest of the introduction, we contrast neo-Marxist approaches with stratificationist approaches. Next, we describe the relationship between neo-Marxist social class and health inequities. Finally, we outline the goals of our analyses.

Stratificationist Versus Relational Theories of Social Class

Most epidemiological studies of inequities in morbidity and mortality employ stratificationist measures of social class based on education and income (i.e., measures of socioeconomic status or SES) rather than relational measures of social class based on property ownership and managerial authority.[2,3] The preponderance of studies using stratificationist measures is partly practical: many health datasets contain information on SES, but few contain information on property and authority.[3] However, by reducing social class to individual attributes like income, stratificationist measures elide social relationships that directly affect health (e.g., relations causing stress) and political and economic processes that *produce* SES and *cause* inequitable distributions of health-promoting resources.[2,3]

In contrast, relational measures of social class ground class in social processes, not in *a priori* attributes of individuals. According to Marx, social class depends on relationships of "domination" and "exploitation."[4,5] In capitalist societies, workers do not own productive property and must sell their labor power to capitalists for a wage, while capitalists own productive property, control workers' labor process (dominating them), and appropriate the fruits of workers' labor as profits (exploiting them).[4,5] These relationships are antagonistic, as the material welfare of the capitalist class, who constitute a minority of the population, *depends* on the material deprivation of the working class, who constitute a majority of the population, and thus are a cause of class inequities.[4]

Neo-Marxist Social Class

The Marxist theory of social class most frequently used in epidemiology, Wright's neo-Marxist theory, recognizes 4 "simple" classes distinguished by property ownership and managerial authority.[4] The 4 classes are worker, manager, petty bourgeois, and capitalist. Workers do not own productive property (instead, to live, they must sell their labor power to capitalists for a wage), nor can they formally influence company policy (except by organizing with fellow workers). Meanwhile, managers do not own productive property, but they can influence company policy (e.g., investment decisions) and exercise control over workers' labor power (i.e., they "dominate" workers). Moreover, they may receive a higher income than workers, particularly through stock ownership, and they are often less exploited than workers, managing the distribution of value produced by workers rather than creating value themselves.[6] Thus, managers occupy a "contradictory" class location, since they share characteristics with workers (e.g., a lack of productive property) and with capitalists (e.g., control over workers' labor power). The petty bourgeoisie are those who own productive property but do not hire labor, meaning unlike capitalists, they are unable to subsist on the exploitation of others' labor alone but instead must labor themselves. Finally, capitalists own productive property and hire labor. Unlike the petty bourgeoisie, capitalists can subsist on the exploitation of workers' labor; capitalists appropriate as profit the difference between the value of what workers produce and what workers are paid, thereby living off workers' labor.

These 4 "simple" classes are divisible into "complex classes."[4] First, workers vary by skill level and credentials. More-skilled workers may be scarcer than less-skilled workers, giving them more bargaining power and resultant higher wages and greater control/autonomy (i.e., they are less exploited and dominated than less-skilled workers). Second, managers are divisible by authority level. High-level managers have substantial workplace autonomy and influence over company policy, and they are compensated largely through stocks and bonuses, not salaries or wages, factors making them more akin to capitalists than to workers. In contrast, low-level managers (i.e., "supervisors") enforce company policy but have little influence over policy decisions, and they are compensated primarily through wages. In these respects, supervisors are more like workers – their subordinates – than high-level managers or capitalists. Finally, capitalists are divisible into "small" and "large" based on the number of workers they employ.

Neo-Marxist Social Class and Health Inequities

Under neo-Marxist theory, the processes of exploitation and domination generate health inequities.[2] For instance, exploitation may directly harm workers' health by subjecting them to hazardous working conditions and denying them basic necessities like adequate housing and health care.[7] In contrast, capitalists can enhance their access to these salutary resources by increasing profits, which often requires degrading working conditions and suppressing wages.[7] In addition, domination may harm workers' health by alienating them from control over their livelihoods, the labor process, and its products.[8] This alienation – and attendant precarity and loss of autonomy – can cause stress, anxiety, and depression.[8] Nonetheless, capitalists may enjoy predictability in and control over their lives, factors associated with better mental and physical health.[9]

Class may also interact with other structural factors to produce health inequities. While a complete discussion of the dynamic, mutually constitutive relationships among racialization, the gendered division of labor, class, and American capitalism is beyond the scope of the present study, the distribution of class membership in the United States is racialized and gendered.[10–12] That people of color and women, particularly women of color, are overrepresented among the working class suggests that inequitable class relations contribute to health disparities between racialized groups and genders. Minoritized workers face heightened health risks insofar as they are segregated into the most exploited and dominated occupations and classes (a phenomenon described by many, including Carmichael and Hamilton, as a type of internal colonialism, and by Boggs as causing "super exploitation").[13,14] At the same time, racism and sexism impair health beyond their role in reproducing the racialized and gendered distribution of class membership alone. For example, among the working class, racialized workers face higher rates of discrimination and oppression than their non-racialized counterparts, with health-harming psychosocial and material consequences like chronic stress, occupational and residential segregation, and hyper-incarceration.[15–17]

Unlike stratificationist theories, neo-Marxist theory does not predict a linear relationship between class position and health. For example, supervisors are simultaneously dominated and exploited by capitalists *and* face antagonism from subordinates, a contradictory class location that may leave them particularly vulnerable to ill health (the "contradictory class location" hypothesis).[8] Similarly, the petty bourgeoisie, like capitalists, own productive property, but they often lack the resources to compete with capitalist firms and thus are at risk of losing their businesses and falling into the working class,[4] a source of stress and potential loss of resources.

Objectives

Prior research has identified substantial health inequities across neo-Marxist social classes.[2] However, this research has limitations. First, most studies have been cross-sectional; consequently, few, including none in the United States, have used mortality as an outcome. Second, only 1 U.S.-based study has produced nationally representative estimates of the magnitude of health inequities across neo-Marxist social classes,[8] and no U.S.-based study has produced nationally representative estimates of inequities in non-mental health outcomes. Finally, no prior research has analyzed how the inequitable distribution of neo-Marxist social classes across racialized groups and genders may contribute to health inequities, nor how racialized group membership modifies the effect of neo-Marxist social class on health.

We addressed these limitations using nationally representative data from the 1972–2016 GSS and 1980–2010 GSS-National Death Index (GSS-NDI). The goals of our study were to:

1. Characterize temporal trends in the U.S. class structure, including the overall population distribution of class membership, the gender-racialized composition of each class, and the class composition of each gender-racialized group
2. Estimate the size of SRH and mortality inequities across classes
3. Identify how the association between class, SRH, and mortality varies across racialized groups and genders

Methods

Data and Analysis Overview

The GSS is a nationally representative survey of non-institutionalized adults ages 18 and over that was conducted annually by the National Opinion Research Center from 1972 to 1994 (except 1979, 1981, and 1992) and biennially thereafter.[18] The GSS used block-quota sampling in the 1972 to 1974 surveys and for half of the 1975 and 1976 surveys; the others surveys used full-probability sampling. From 1972 to 2004, the GSS excluded Spanish speakers from the target population. However, since 2006, Spanish speakers have been included. Interviews are conducted in person.

Our sample included respondents in the labor force (i.e., those who identified as working full time or part time, as well as those who identified as being unemployed or laid off) ages 25 to 64; we excluded respondents outside those ages who identified as temporarily not working, being a retiree, being a student, "keeping house," or "other." Analyses of temporal trends in class structure, as well as class and SRH, used the 1972–2016 survey waves (aside from the 1975, 1978, 1983, and 1986 waves, when questions on managerial authority were not asked). However, because of the GSS's split-ballot design, sample sizes varied across the 2 analyses: analyses of class structure included 25,382 respondents, while analyses of class and SRH included 22,401 respondents. Meanwhile, analyses of class and all-cause mortality used the 1980–2010 survey waves (aside from the 1983 and 1986 waves) linked to the National Death Index (NDI) through 2014;[19] these analyses included 17,305 respondents. Muennig et al. linked GSS respondents to the NDI using a probabilistic matching algorithm that included respondent characteristics like social security number; first, middle, and last names; date of birth; and demographic factors such as gender, race, and state of birth.[19]

Using R's Survey package, we weighted our estimates to make them nationally representative and adjusted their standard errors via Taylor series linearization to account for the GSS's complex survey design.[20] The R code used in our analyses is available on Open Science Framework (https://osf.io/ukb6y/?view_only=b630d24e94464d19936 2b9241d8430e6). Data from the class-structure and SRH analyses is publicly available on the GSS website (gss.norc.org), where readers can also find information about applying for access to the GSS-NDI data.

Measures

Class. We drew from Wright's neo-Marxist class theory,[4,5] as well as Wodtke's prior class analyses of the GSS,[21,22] to construct our "simple" and "complex" class measures; Figure 1 shows how we allocated respondents into classes. First, workers were those who were not self-employed, who were not chief executive officers (CEOs), and who did not supervise others. In addition, following Braverman,[23] we included the unemployed in the working class, as many workers cycle between periods of employment, when they belong to the "active army of workers," and periods of unemployment, when they belong to the "reserve army of labor." As expected, given their precarity, the unemployed working class tended to have lower SES than the employed working class. Second, managers were those who were not self-employed, who were not CEOs, and who did supervise others. Third, the petty bourgeoisie were those who were self-employed and did not supervise others, or those who were CEOs and did not supervise others. Finally, capitalists were those who were self-employed and did supervise others, or those who were CEOs and did supervise others. We classified CEOs as capitalists or petty bourgeoisie because, unlike most managers, they often own a significant share of their firm's productive property (e.g., through stocks) and, in the case of CEO-capitalists, may directly appropriate and distribute the profits produced by workers' labor.[5,6,24]

For our "complex" class measure, we subdivided workers into "less-skilled" and "more-skilled" based on occupational prestige scores below and above the survey-weighted median.[25] The GSS calculated occupational prestige scores for 860 occupational titles using ratings from 1,001 survey respondents and converted the scores to a scale ranging from 0 (lowest) to 100 (highest); the resulting scale correlates strongly with education and income.[25] Unemployed workers were also placed into the "less-skilled" category, as less-skilled workers are most likely to cycle between periods of employment and unemployment.[23] Next, we subdivided managers into "low-level" and "high-level" based on whether their supervisees supervised others. This subdivision differs from Wright's, which is based on whether managers have policy authority,[4] information unavailable in the GSS. Finally, we subdivided capitalists into "small" and "large" based on whether their supervisees supervised others, differentiating capitalists owning smaller firms from those owning larger firms.

Health. For the SRH analyses, we dichotomized SRH – measured using the standard question ("Would you say your own health, in general, is . . .") – as poor/fair versus good/excellent, as dichotomization may improve reliability.[26] For the mortality analyses, we defined the outcome as all-cause mortality. Per the advice of the

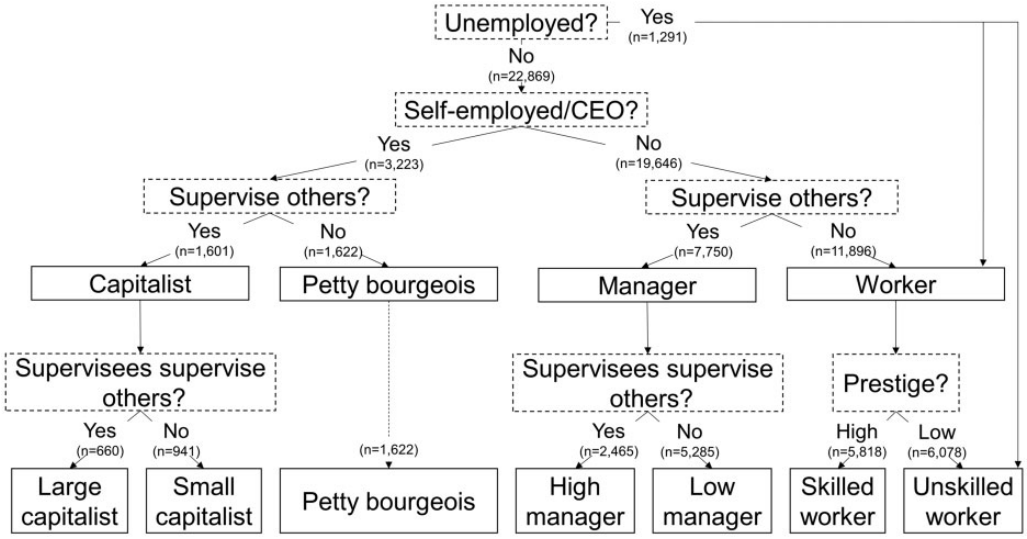

Figure 1. Flow chart depicting how respondents were allocated into different classes. Sample sizes displayed at each stage are the sample sizes prior to multiple imputation.

GSS-NDI's administrators, we excluded respondents who survived past 90 years of age because their death-status data may be unreliable.[27]

Covariates. Demographic and socioeconomic variables included respondents' age, racialized group membership (specified as black/other/white unless otherwise noted), gender (men/women), education (<HS/HS/some college/≥college), and family income. The GSS did not ask about Hispanic/Latinx ethnicity, nor classify racialized group membership into more detailed categories, until the 2000 survey; as such, we were unable to use a more detailed measure of racialized group membership.

Statistical Analyses

First, we characterized the demographic and socioeconomic composition of each class, and then we examined how class structure changed temporally. To this end, we calculated descriptive statistics of respondents' characteristics stratified by the simple and complex class measures. Next, by decade, we estimated the proportion of the overall population in each simple and complex class position. Finally, by decade, we estimated the class composition of each gender-race group, as well as the gender-race composition of each class. To ensure adequate sample sizes, the latter analyses focused on the simple class measure, and respondents were only subdivided into broad gender-race groupings (women of color, men of color, white women, white men).

Next, we estimated the size of SRH inequities across classes. To this end, we estimated the prevalence of poor/fair SRH among each class relative to the prevalence among workers (i.e., prevalence ratios) using log-linear Poisson models adjusted for age and year, which we specified as 3-knot restricted cubic splines to allow for nonlinear confounder-outcome relationships.[28] We gender-stratified these models, as we hypothesized that the relationship between class and SRH would vary by gender due to the gendered division of labor. However, we did not adjust the models for racialized group membership, education, or other demographic characteristics, as we sought to characterize the total magnitude of class inequities in SRH, knowing these inequities would be partially due to the overrepresentation of people of color and low SES groups in more exploited and dominated classes. In sensitivity analyses, we tested whether the relationship between the simple class measure and SRH varied by race using a race by class interaction term, the significance of which we evaluated using a Wald test.[29] We did not test for interaction using the complex class measure because of small cell sizes across certain combinations of gender, race, complex class, and SRH.

Finally, we estimated the size of mortality inequities across classes. To this end, we estimated the hazard of mortality among each class relative to the hazard among workers (i.e., hazard ratios) using Cox proportional hazards regression adjusted for age and year, which we specified as 3-knot restricted cubic splines. As in the models focused on SRH, these models were gender-stratified, and in sensitivity analyses, we tested whether the relationship between the simple class measure and mortality varied by race using a race-by-class interaction term. For the deceased, we calculated follow-up time for the models by subtracting the year of the baseline interview from the year of death, while for those living at the end of 2014, we calculated follow-up time by subtracting the year of the baseline interview from 2014. We verified the validity of the proportional hazards assumption using scaled Schoenfeld residuals.[30]

Missing Data

Each of the variables used in the class measures, as well as other covariates, had a small amount of unplanned missingness (<8%), as well as a substantial amount of planned missingness (due to the GSS's split-ballot design). To address the unplanned missingness, we used multiple imputation by chained equations with 20 replications (via R's MICE package) to impute missing values,[31] assuming missing values were missing randomly conditional on measured covariates.[32] Estimates and standard errors from 20 multiply-imputed datasets were combined using Rubin's Rules.[32] We did not address planned missingness, as we assumed those missing values were missing completely at random. Furthermore, we did not impute missing values in either of our dependent health variables. Estimates from complete-case analyses were nearly identical to estimates from analyses of the multiply-imputed datasets.

Results

Descriptive Analyses

For the simple class measure, 54% of respondents were workers, 32% were managers, 7% were petty bourgeoisie, and 7% were capitalists (Table 1). Unlike members of other classes, most workers were women. Furthermore, compared to members of other classes, workers more often belonged to minoritized racial groups, were less educated, and had lower incomes. Meanwhile, managers tended to be more educated and have higher incomes than the petty bourgeoisie, and they were less likely to be white than the petty bourgeoisie. Finally, most capitalists were men (73%) and white

Table 1. Demographic and Socioeconomic Composition of Respondents Ages 25 to 64 Stratified by the Simple Class Measure.

	Workers	Managers	Petty Bourgeoisie	Capitalists
%	54.0	32.4	6.8	6.8
Male (%)	49.4	55.4	52.2	72.7
Race (%)				
Black	15.4	10.8	6.3	4.4
Other	8.2	6.3	7.2	5.6
White	76.4	82.9	86.5	90.0
Highest degree (%)				
<HS	16.1	9.2	15.2	10.5
HS	53.4	48.0	53.0	44.1
Junior college	7.1	8.1	6.6	5.7
≥College	23.3	34.7	25.2	39.6
Income (median, Q1, Q3)[a]	5.9 (3.5, 9.0)	7.8 (5.0, 11.5)	6.1 (3.5, 10.6)	10.1 (6.1, 15.8)
Age (mean, SD)	41.6 (10.8)	41.7 (10.4)	44.9 (10.5)	44.7 (10.3)

Estimates are based on survey-weighted, unimputed GSS data from the 1972–2016 survey waves, which included 24,427 respondents.
[a]Family income in tens of thousands of 2016 dollars. Q1 and Q3 are the first and third quartiles.

Table 2. Demographic and Socioeconomic Composition of Respondents Ages 25 to 64 Stratified by the Complex Class Measure.

	Less-Skilled Workers	More-Skilled Workers	Low Managers	High Managers	Petty Bourgeoisie	Small Capitalists	Large Capitalists
%	30.5	23.5	22.0	10.4	6.8	4.0	2.8
Male (%)	54.2	42.9	52.5	61.6	52.2	69.4	77.8
Race (%)							
Black	18.0	12.2	10.8	10.8	6.3	5.0	3.6
Other	9.0	7.4	6.2	6.5	7.2	5.9	4.9
White	73.0	80.4	83.0	82.8	86.5	89.1	91.5
Highest degree (%)							
<HS	23.9	5.5	9.8	7.8	15.2	13.3	5.8
HS	60.5	44.3	49.7	44.5	53.0	47.8	39.1
Junior college	5.6	9.4	8.5	7.3	6.6	5.6	6.0
≥College	10.0	40.9	32.1	40.4	25.2	33.3	49.2
Income (median, Q1, Q3)[a]	4.9 (2.7, 7.6)	7.2 (4.7, 10.7)	7.4 (4.7, 11.0)	8.6 (5.7, 13.0)	6.1 (3.5, 10.6)	8.4 (5.3, 14.8)	14.0 (7.8, 17.4)
Age (mean, SD)	41.7 (10.9)	41.5 (10.6)	41.3 (10.5)	42.5 (10.1)	44.9 (10.5)	44.1 (10.7)	45.6 (9.7)

Estimates are based on survey-weighted, unimputed GSS data from the 1972–2016 survey waves, which included 24,160 respondents.
[a]Family income in tens of thousands of 2016 dollars. Q1 and Q3 are the first and third quartiles.

(90%), and they tended to be more educated and have higher incomes than members of other classes.

For the complex class measure, 30% of respondents were less-skilled workers, 23% were more-skilled workers, 22% were low-level managers, 10% were high-level managers, 7% were petty bourgeoisie, 4% were small capitalists, and 3% were large capitalists (Table 2). First, compared with members of other classes, less-skilled workers more often belonged to minoritized racial groups, were less educated, had lower incomes, and were more likely to be men compared with more-skilled workers, low-level managers, and the petty bourgeoisie. Second, regarding race, education, and income, more-skilled workers resembled low-level managers, while high-level managers resembled small capitalists. Members of all 4 of these classes tended to have higher SES than the petty bourgeoisie. Third, compared with members of other classes, large capitalists were more likely to be men (78%) and white (92%) and tended to be more educated and have higher incomes. Finally, although those with property ownership and/or managerial authority tended to have higher family incomes than others, income inequality within classes was high. For example, although the median family income of less-skilled workers was just a third of that of large capitalists, the top quarter of less-skilled workers had family incomes that exceeded those of the bottom quarter of large capitalists.

Overall, class structure changed little over time (Figure 2). In the 1970s, 56% of the population were

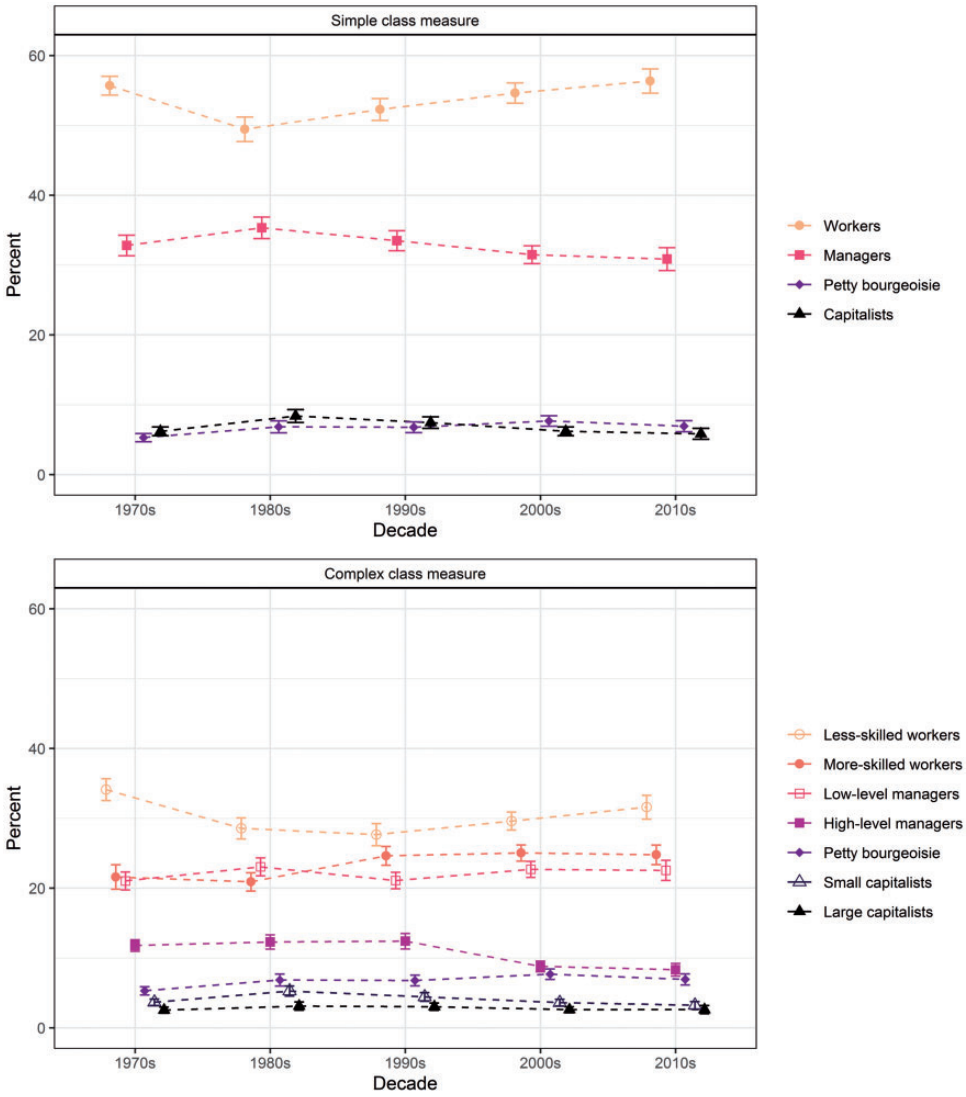

Figure 2. Temporal trends in the percent of the population aged 25 to 64 years in each simple and complex class position. Estimates are based on survey-weighted, multiply-imputed GSS data from 1972 to 2016. Confidence intervals calculated via Taylor series linearization.

workers, 33% were managers, 5% were petty bourgeoisie, and 6% were capitalists, while in the 2010s, 57% of the population were workers, 30% were managers, 7% were petty bourgeoisie, and 6% were capitalists. The class composition of each gender-race group also changed little over time (Figure 3). For example, in the 1970s, 67% of women of color were workers, 63% of men of color were workers, 62% of white women were workers, and 50% of white men were workers, while in the 2010s, 64% of women of color were workers, 65% of men of color were workers, 58% of white women were workers, and 52% of white men were workers. Nonetheless, the gender-race composition of the classes changed substantially (Figure 3). For example, in the 1970s, white men constituted 50% of workers, 60% of managers, 67% of the petty bourgeoisie, and 77% of capitalists. However, by the 2010s, they were just 34% of workers, 40% of managers, and 37% of the petty bourgeoisie, although they remained 62% of capitalists. The demographic composition of the "people of color" category also likely changed over time, as Asian/Native Hawaiian/Pacific Islander, Hispanic/Latinx, and foreign-born individuals made up an increasing share of the U.S. population each decade.[33,34]

Class and Self-Rated Health

Class inequities in SRH, which were substantial, were larger among men than among women (Table 3). For the simple class measure, among men, the prevalence of poor/fair health was 24% lower among managers (95% CI: 0.68, 0.84), 19% lower among the petty bourgeoisie

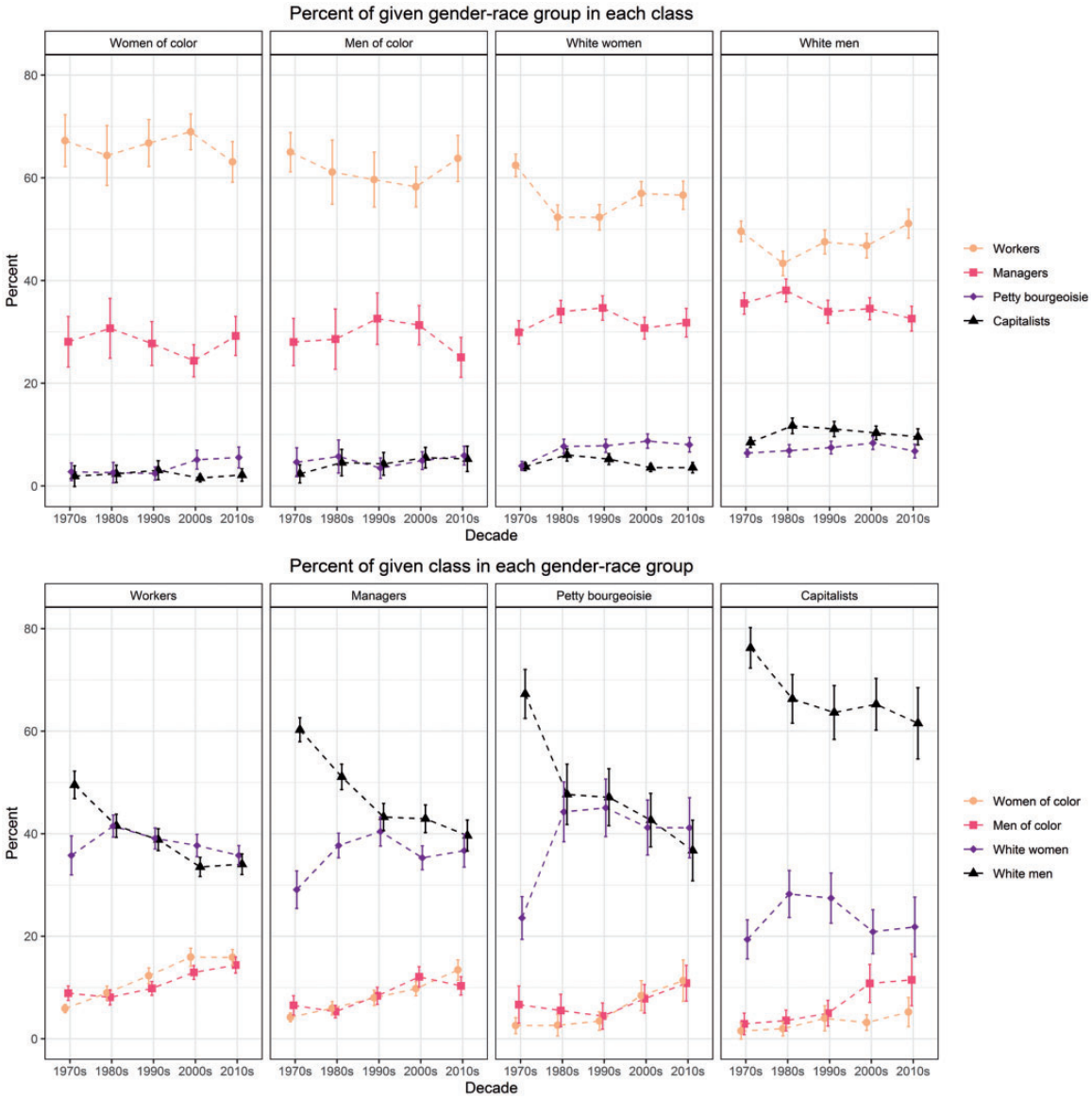

Figure 3. Temporal trends in the class composition of each gender-race group (top panel) as well as the gender-race composition of each class (bottom panel), among respondents aged 25 to 64 years. Estimates are based on survey-weighted, multiply-imputed GSS data from 1972 to 2016. Confidence intervals calculated via Taylor series linearization.

(95% CI: 0.68, 0.96), and 45% lower among capitalists (95% CI: 0.46, 0.67) than among workers, while among women, the prevalence of poor/fair health was 25% lower among managers (95% CI: 0.67, 0.84), 13% lower among the petty bourgeoisie (95% CI: 0.73, 1.05), and 26% lower among capitalists (95% CI: 0.56, 0.98) than among workers. For the complex class measure, among men, low-level managers and the petty bourgeoisie had a lower prevalence of poor/fair health than less-skilled workers (prevalence ratios of 0.71 and 0.67 respectively) but a higher prevalence of poor/fair health than more-skilled workers, high-level managers, small capitalists, and large capitalists (prevalence ratio range: 0.45 to 0.56). Among women, all other classes had a lower prevalence of poor/fair health than less-skilled workers, but the range of prevalence ratios was smaller than the range among men (0.54 for more-skilled workers to 0.68 for the petty bourgeoisie).

We found no evidence that the association between class and SRH varied by race among men or women on the multiplicative scale, as the relationship between class and health was similar within races and the p-values for the joint significance of the parameters of the class by race interaction terms were large (0.94 for men and 0.84 for women; Table 4). Nonetheless, among men, only capitalists of color had a lower

Table 3. Adjusted Prevalence of Poor/Fair Self-Rated Health Among Each Class Position Relative to the Prevalence Among Workers (for the Simple Class Measure) and Less-Skilled Workers (for the Complex Class Measure) Among Respondents Ages 25 to 64.

	Men			Women		
	PR[a]	95% CI		PR[a]	95% CI	
Simple class measure (ref: workers)						
Managers	0.76	0.68	0.84	0.75	0.67	0.84
Petty bourgeoisie	0.81	0.68	0.96	0.87	0.73	1.05
Capitalists	0.55	0.46	0.67	0.74	0.56	0.98
Complex class measure (ref: less-skilled workers)						
More-skilled workers	0.56	0.50	0.64	0.54	0.48	0.61
Low-level managers	0.71	0.63	0.80	0.60	0.53	0.68
High-level managers	0.50	0.42	0.58	0.55	0.45	0.68
Petty bourgeoisie	0.67	0.56	0.81	0.68	0.57	0.81
Small capitalists	0.45	0.35	0.58	0.57	0.42	0.78
Large capitalists	0.48	0.36	0.63	0.58	0.36	0.95

Abbreviations: CI, confidence interval; PR, prevalence ratio.
Estimates are based on survey-weighted, multiply-imputed data on 22,401 GSS respondents from the 1972–2016 survey waves.
[a]PRs are estimated from log-linear Poisson models adjusted for age and year with 3-knot restricted cubic splines. Confidence intervals calculated via Taylor series linearization.

Table 4. Adjusted Prevalence of Poor/Fair Self-Rated Health Among Each Race-Class Group Relative to the Prevalence Among White Workers Among Respondents Ages 25 to 64.

	Men			Women		
	PR[a]	95% CI		PR[a]	95% CI	
Simple class measure (ref: white workers)						
White managers	0.76	0.68	0.85	0.79	0.70	0.90
White petty bourgeoisie	0.83	0.68	1.00	0.91	0.74	1.12
White capitalists	0.56	0.46	0.69	0.82	0.61	1.09
Workers of color	1.28	1.12	1.46	1.64	1.45	1.85
Managers of color	1.03	0.84	1.26	1.19	0.96	1.47
Petty bourgeoisie of color	1.05	0.68	1.61	1.66	1.14	2.44
Capitalists of color	0.88	0.52	1.49	1.13	0.58	2.22

Abbreviations: CI, confidence interval; PR, prevalence ratio.
Estimates are based on survey-weighted, multiply-imputed data on 22,401 GSS respondents from the 1972–2016 survey waves.
[a]PRs are estimated from log-linear Poisson models adjusted for age and year with 3-knot restricted cubic splines and a class by race interaction term. Confidence intervals calculated via Taylor series linearization.

prevalence of poor/fair health than white workers, while among women, all classes of color had a higher prevalence of poor/fair health than white workers, although the estimates were imprecise due to small cell sizes.

Class and Mortality

For the mortality analyses, respondents were followed for a median and maximum of 14 years and 34 years, respectively. During follow-up, there were 3,038 deaths; the probability of survival at the end of follow-up was 60%. Class inequities in mortality were smaller than those observed for SRH, particularly among women (Table 5). For the simple class measure, among men, only capitalists had meaningfully lower mortality hazard than workers (HR: 0.83, 95% CI: 0.70, 0.99), while among women, mortality inequities across classes were null. Across both genders, the petty bourgeoisie had a somewhat higher mortality hazard than workers, although precision was poor (men HR: 1.08, 95% CI: 0.90, 1.31; women HR: 1.12, 95% CI: 0.88, 1.42). For the complex class measure, among men, all classes but the petty bourgeoisie had a lower mortality hazard than less-skilled workers, with hazard ratios ranging from 0.71 to 0.86. Among women, only more-skilled workers, low-level managers, and small capitalists had a meaningfully lower mortality hazard than less-skilled workers (hazard ratio range: 0.79 to 0.88), although most of the estimates were imprecise.

Table 5. Adjusted Hazard of Mortality Among Each Class Position Relative to the Hazard Among Workers (for the Simple Class Measure) and Less-Skilled Workers (for the Complex Class Measure) Among Respondents Ages 25 to 64.

	Men			Women		
	HR[a]	95% CI		HR[a]	95% CI	
Simple class measure (ref: workers)						
Managers	0.93	0.83	1.04	1.03	0.90	1.18
Petty bourgeoisie	1.08	0.90	1.31	1.12	0.88	1.42
Capitalists	0.83	0.70	0.99	0.99	0.73	1.33
Complex class measure (ref: less-skilled workers)						
More-skilled workers	0.79	0.67	0.92	0.79	0.67	0.93
Low-level managers	0.85	0.74	0.98	0.88	0.74	1.05
High-level managers	0.86	0.73	1.02	1.01	0.81	1.25
Petty bourgeoisie	1.00	0.82	1.21	1.00	0.78	1.28
Small capitalists	0.71	0.56	0.91	0.84	0.58	1.23
Large capitalists	0.83	0.66	1.05	0.97	0.60	1.57

Abbreviations: CI, confidence interval; HR, hazard ratio.
Estimates are based on survey-weighted, multiply-imputed data on 17,305 GSS respondents from the 1980–2010 survey waves linked to the National Death Index through 2014.
[a]HRs are estimated from Cox proportional hazards models adjusted for age and year with 3-knot restricted cubic splines. Confidence intervals calculated via Taylor series linearization.

Table 6. Adjusted Hazard of Mortality Among Each Race-Class Group Relative to the Hazard Among White Workers Among Respondents Ages 25 to 64.

	Men			Women		
	HR[a]	95% CI		HR[a]	95% CI	
Simple class measure (ref: white workers)						
White managers	0.89	0.79	1.01	1.02	0.88	1.20
White petty bourgeoisie	1.09	0.89	1.32	1.25	0.97	1.61
White capitalists	0.86	0.72	1.04	1.07	0.78	1.46
Workers of color	1.29	1.07	1.55	1.47	1.21	1.79
Managers of color	1.67	1.33	2.11	1.82	1.39	2.37
Petty bourgeoisie of color	1.59	0.95	2.67	0.88	0.38	2.05
Capitalists of color	1.01	0.46	2.24	1.19	0.45	3.14

Abbreviations: CI, confidence interval; HR, hazard ratio.
Estimates are based on survey-weighted, multiply-imputed data on 17,305 GSS respondents from the 1980–2010 survey waves linked to the National Death Index through 2014.
[a]HRs are estimated from Cox proportional hazards models adjusted for age and year with 3-knot restricted cubic splines and class by race interaction terms. Confidence intervals calculated via Taylor series linearization.

We found some evidence that the association between class and mortality varied by race on the multiplicative scale (Table 6). Unlike among white men, among men of color, managers and the petty bourgeoisie had a substantially higher mortality hazard than workers, although all the estimates were imprecise, and the p-value for the joint significance of the parameters of the class by race interaction term was not significant (0.11). Meanwhile, unlike among white women, among women of color, managers had a higher mortality hazard than workers, while the petty bourgeoisie had a lower mortality hazard than workers. Again, however, the estimates were imprecise, and the p-value for the joint significance of the parameters of the class by race interaction term was not significant (0.19). Finally, among men, only capitalists of color did not have a higher mortality hazard than white workers, while among women, only capitalists of color and petty bourgeoisie of color did not have a higher mortality hazard than white workers.

Discussion

Summary of Findings

Applying a neo-Marxist theory of social class based on property ownership, managerial control, and credentials/skill to a nationally representative dataset, we analyzed

temporal trends in the U.S. class structure, as well as the associations among class, SRH, and mortality.

Regarding the U.S. class structure, we found that it has changed little since the 1970s, with workers constituting over half the population each decade, a finding which holds within each gender-race grouping (except among white men from the 1980s to 2000s). Nonetheless, white men have not constituted a majority of the working class since the 1970s, although they remain the majority of capitalists. If anything, white women and people of color may constitute an even larger share of the working class than what we estimated in this study, given that when constructing our class measures, we were unable to consider respondents' relationships to other types of labor, such as unwaged housework, nor include those who were "institutionalized," such as those in jails or prisons.[35]

Regarding SRH, we found large inequities in SRH across the simple and complex class measures among men and women. Moreover, among men, we found some evidence for the contradictory class location hypothesis, as low-level managers reported worse SRH than all classes but less-skilled workers. These relationships did not vary by race, although among men, only capitalists of color had a lower prevalence of poor/fair health than white workers, while among women, all classes of color had a higher prevalence of poor/fair health than white workers.

Regarding mortality, among men, we found small inequities in mortality across both class measures, while among women, we only found inequities in mortality across the complex class measure. Although we found no evidence for the contradictory class location hypothesis among men or women, we did find some evidence that the relationship between class and mortality varied by race. Finally, among men, all classes of color except capitalists had a higher mortality hazard than white workers, while among women, only petty bourgeoisie of color and capitalists of color did not have a higher mortality hazard than white workers. Coupled with our SRH findings, this suggests that health among whites at the bottom of the class structure tends to be better than health among people of color of all classes aside from those at the very top of the class structure, indicating that persistent structural racism in the social division and organization of labor has consequences for population health.

Comparison With Prior Research

Our findings are broadly consistent with prior empirical research. Regarding the temporal trends, using similar measures of social class and the same dataset, Wodtke found that the U.S. class structure in the late 2000s closely resembled its structure in the 1970s.[21] Moreover, he found little change in the overrepresentation of women and black people, particularly black women, in the working class.[21] Likewise, Braverman found that although the working class's population share increased from ~51% in 1900 to ~65% in 1940, the increase leveled off through 1970.[23] Meanwhile, applying Braverman's class measure to the Current Population Survey, Jonna and Foster found that the working class's population share did not change meaningfully between 1960 and 2011.[36]

Regarding the relationship between class and health, in their 2015 review of neo-Marxist class analysis and health, Muntaner et al. found that across 19 studies, capitalists and managers reported better health than workers and the petty bourgeoisie.[2] Seven of these studies used SRH as an outcome, but only 2 used mortality. In the 1 mortality study (based in Spain) that included both men and women, belonging to the managerial or capitalist classes was associated with reduced mortality risk among men but not among women, findings broadly consistent with ours.[37] Meanwhile, in the 1 U.S.-based study focused explicitly on contradictory class locations, Prins et al. found that supervisors (analogous to low-level managers in our study) reported a 76% higher prevalence odds of lifetime anxiety and 26% higher prevalence odds of lifetime depression than workers.[8] Although our study found some evidence for the contradictory class location hypothesis among men, the effects in Prins's study were much stronger than those in ours. However, unlike mental health, SRH and mortality may be more affected by exposure to material deprivation (greater among workers) than exposure to job strain and other occupational stressors (possibly greater among low-level managers).

To our knowledge, no research has analyzed how the relationship between relational social class, SRH, and mortality varies by race. Nonetheless, studies using stratificationist measures of socioeconomic status (SES) have found that the SES-health relationship does vary by racialized group. Specifically, SES gradients in morbidity tend to be smaller among black people than among white people, although gradients in mortality tend to be similar.[38] Furthermore, while SES inequities in health tend to be larger than racial inequities in health (insofar as they can be disentangled), much U.S.-based research has documented the heightened risk of morbidity and mortality among racialized groups, even among those with higher SES.[38–40] Thus, our finding that capitalists of color were the only class of color that did not fare consistently worse than white workers broadly aligns with this research.

Limitations

Our approach had limitations. First, the GSS-NDI only measured class once, preventing us from analyzing how

temporal changes in class membership and duration of class membership were associated with health. This is particularly problematic for mortality, as respondents' class position at baseline may not have reflected their class position at an etiologically relevant time closer to death. However, due to limited class mobility in the United States,[41] we think it is unlikely that respondents' class positions changed substantially over their lifetimes.

Second, respondents may have been socially selected into their class positions; for example, their ill health may have caused them to fall into the working class rather than the converse. However, although prior research has shown that social selection does occur, it generally explains less than social causation (i.e., the effect of social class on health).[42] Thus, we do not think that social selection can fully account for our findings.

Third, a prior study found that racial mortality inequities estimated using the GSS-NDI tended to be larger than those estimated using other nationally representative surveys, while educational mortality inequities tended to be smaller, patterns which were similar across genders.[43] These discrepancies may be due to suboptimal matching between the GSS and the NDI; for example, many GSS records lack social security numbers, which may compromise the matching algorithm's accuracy.[43] Thus, the mortality inequities presented in this study should be interpreted cautiously. However, to our knowledge, no other nationally representative datasets with mortality follow-up contain questions on property ownership and managerial authority needed to measure relational social class.

Fourth, we may have misclassified respondents' class positions. In particular, the petty bourgeois category may have contained truly petty-bourgeois respondents (e.g., small shopkeepers) as well as gig workers and other precarious workers who identified as self-employed but whose true relationship to property and authority placed them in the working class. If substantial, this misclassification would make the health of the petty bourgeoisie appear spuriously similar to the health of the working class.

Finally, we were unable to examine trends in the U.S. class structure – or variation in the relationship between class, SRH, and mortality – using detailed measures of racialized group membership, as the GSS lacked Hispanic/Latinx ethnicity data and detailed racialized group membership data throughout most of the study period. Moreover, the sample contained small numbers of foreign-born respondents and respondents of color. As previously mentioned, the demographic composition of our broad racialized-group-membership categories changed over the study period, as Asian/Native Hawaiian/Pacific Islander, Hispanic/Latinx, and foreign-born individuals constituted an increasing share of the U.S. population each decade.[33,34] Thus, it is possible that the trends we observed across our broad racialized-group-membership categories do not hold within narrower groupings, and that the United States's changing demographic composition affected the estimated relationships between class, SRH, and mortality. That said, in a context of white-supremacist discrimination and oppression, the most salient aspect of *inclusion* in a particular racialized category may be *exclusion* from whiteness. This is evident given that people of color remained an oppressed group relative to white people throughout the study period.

Conclusion

We identified substantial inequities in SRH and smaller inequities in mortality across neo-Marxist social classes. In future research, investigators should examine these associations using data with repeated measures of social class, which could help elucidate causal relationships between relational social class, health, and health inequities. Researchers should also consider how exploitation and domination interact with other political-economic processes under capitalism, like the expropriation of unwaged reproductive labor (data on which was unavailable in GSS), to generate health inequities.

Our research adds to the growing evidence connecting the fundamental organization of the capitalist economic system – namely the private ownership of the means of production and attendant class-based exploitation and domination – to inequities in morbidity and mortality across classes. Moreover, given the enduring racialized and gendered distribution of class in the United States, our findings suggest that class-based exploitation and domination may contribute to health inequities between racialized groups and genders, although future research using longitudinal data is needed to discern whether the associations identified in this study are causal. Relational approaches such as ours are better equipped than stratificationist approaches to elucidate the social processes that produce these intersecting patterns of health inequities within and across classes, racialized groups, and genders.

Because of the structural class dynamics that may be animating these inequities, interventions that do not directly challenge capitalist social relations may not sustainably alter population health inequities. For example, psychosocial workplace interventions alone (e.g., workplace wellness programs to reduce office stress) may be insufficient in the long term if they are disconnected from broader efforts to increase worker power and restructure the economy. These broader efforts include recent policy proposals, such as providing a jobs guarantee, incentivizing worker ownership, and removing barriers to unionization, as well as social movements

organizing to transform the economic system itself. Although the capitalist class in the United States has grown increasingly hegemonic over the last several decades,[44] working-class organizing has recently surged. Movements such as the teachers' strikes and women's strikes suggest that labor (both productive and reproductive), as well as access to health-promoting necessities like good schools, childcare, and health care, will remain crucial sites of class struggle.[35,45] Public-health researchers, policymakers, and practitioners committed to rectifying health inequities should engage in these struggles.

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