Socioeconomic Status (SES) and Health at Midlife; A Comparison of Educational Attainment with Occupation-Based Indicators

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Abstract

Purpose: Educational attainment is a widely used indicator of socioeconomic status in health studies. However, little is known about its relationship to health relative to measures of occupational standing. This study directly compares education with an array of occupational measures -- including social class -- in relation to health.

Methods: The Wisconsin Longitudinal Study collected self-reported health data from a sample of 6875 Wisconsin high school graduates aged 53-54 in 1992-1993. The analysis regresses overall health, physical symptoms, and medical conditions on socioeconomic indicators, using logistic regression.

Results: Associations of health outcomes with occupational standing net of educational attainment are mainly weak or non-existent. "Occupational education" is the only indicator to have a strong association with health net of education in analyses of both men and women.

Conclusions: While occupation is sometimes an important mechanism linking education and health, control for the overall relation between SES and health may not require measures of occupational standing when educational attainment is measured well. However, the present findings are limited to non-Hispanic white high school graduates from Wisconsin at ages 53-54.

Introduction

Within the past few years, there has been renewed interest in socioeconomic status and its relationship with health and well-being.[1-4] Sources of this interest probably include rising economic inequality in the United States and demands for improved social reporting of SES-health relationships, along with evidence of the persistence or growth of differential health outcomes.[5,6] Prompted by these developments, we use a unique set of data on Wisconsin high school graduates at midlife to compare educational attainment with several alternative occupation-based measures of social standing – including measures of social class – in their relationship to health outcomes. Our goal is to investigate whether measures of occupational standing contribute additional information to the prediction of health outcomes after controlling the influence of educational attainment.

Socioeconomic Status and Health

Educational attainment, according to sociological studies of intergenerational mobility, is one of three three main, distinct components of socioeconomic status, a position is shares with occupational status and income. These three indicators are by no means exhaustive measures of socioeconomic status, a broad concept that refers to the placement of persons, families, households, census tracts, or other aggregates with respect to the capacity to create or consume goods that are valued in our society. Other potential components include wealth and tangible possessions such as home appliances or libraries, houses, cars, boats, or degrees from elite colleges and universities. At some times, socioeconomic status has also been taken to include measures of participation in social, cultural, or political life. Given this wide array of manifestations – which would require hundreds of measures to capture in full – the three main indicators have served as reference points to compare findings across studies and help in the

construction of a cumulative literature on the transmission of socioeconomic status across generations.

Epidemiological and sociological analyses of health also commonly use educational attainment as a measure of SES,[4,7,8] and most often proceed on the theoretical assumption that income and occupational standing – which are relatively much more expensive to collect and code – contribute additional, distinct information in the study of health outcomes. Available evidence supports the assumption that income has an association with health separate from that indexed by educational attainment.[9] Further, the two measures index different processes; the association between educational attainment and adult health represents the one-way influence of SES on health – to the extent that educational attainment is almost always completed before the onset of adult health problems – and the association between income and health represents bidirectional influences.[10]

However, the extent to which educational attainment and occupational status have unique relationships with health, net of each other, remains uncertain. While it is well established that educational attainment and occupational status are distinct components of SES,[11] the assumption that they have distinct relationships with health remains largely unexamined.[12] Occupational standing is much more static than income over the life course, and may measure the same aspects of SES as educational attainment in the study of health. For at least some health outcomes these two SES indicators do not have mutually unique associations with health,[12] and it is currently unknown (a) whether these cases are the exception or the rule, (b) whether different measures of occupational status would yield different results, and (c) how the occurrence of these cases varies across different types of health outcomes. Answers to these questions are needed to provide

empirically-based guidance for the selection of occupation-based measures in studies that assess and monitor the association between SES and health.

Below we investigate these questions by examining whether measures of occupational standing contribute information to the prediction of health outcomes after taking the influence of educational attainment into account. Two reasons lead this study to use educational attainment as the reference SES measure to which other occupational measures are compared. First, education is the most commonly used measure of SES in the health literature, so that its use as a reference measure makes the results of this study more readily comparable to previous research. In particular, the results can suggest whether the many health existing studies that measure SES either with educational attainment alone or with both educational attainment and income may have benefitted by including additional occupational information. Second, because information on educational attainment is much less costly to collect and code, it is a strategic reference measure from a practical perspective in order to examine whether the additional expense of collecting occupational standing measures contributes additional information to the prediction of health outcomes.

Methods

The WLS Sample

The 1992-93 follow-up of the Wisconsin Longitudinal Study (WLS) has been specially designed to examine the research questions of this study. In addition to containing measures of educational attainment and self-reported health outcomes, its collection of extensive information on socioeconomic status provides a rare opportunity to directly compare several different, competing measures of occupational standing in their relation to health outcomes. Gregorio, Walsh, and Paturzo[13] have compared the association of several measures of occupational standing

with mortality in the National Longitudinal Mortality Study, but without controlling educational attainment.

The WLS is based on a random sample of 10,317 men and women who graduated from Wisconsin high schools in 1957. Almost all sample members were born in 1939. The survey has collected data from the original respondents in 1964, 1975, and 1992-93.[14] The analysis in this study is based on the 1992-93 wave of data collection, which includes 8,493 telephone interviews of approximately 9,750 surviving men and women and a supplemental mail survey on health, sent only to members who completed the telephone interview, that was returned by 6,875 respondents. Most members of the WLS were 53 or 54 years old during the last wave of data collection.

Among Americans aged 50 to 54 in 1990 and 1991, approximately 66 percent are non-Hispanic white women and men who completed at least 12 years of schooling[15] and thus resemble the WLS cohort. The WLS cohort precedes by about a decade the bulk of the baby boom generation that continues to tax social institutions and resources at each stage of life. For this reason, the study can provide early indications of trends and problems that will become important as the larger group passes through its fifties.

The WLS data also have obvious limitations. Some strata of American society are not represented. Everyone in the primary sample graduated from high school. Sewell and Hauser[11] estimated that about 75 percent of Wisconsin youth graduated from high schools in the late 1950s. There are only a handful of African American, Hispanic, or Asian persons in the WLS. About 19 percent of the WLS sample is of farm origin; this is consistent with national estimates in cohorts of the late 1930s. In 1964, in 1975, and again in 1992, 70 percent of the sample lived in Wisconsin, but 30 percent lived elsewhere in the U.S. or abroad.

For a study of socioeconomic differentials in health the survey has unique strengths and weaknesses. Its strengths include a large sample size, coverage of both women and men, and careful measurement of an array of relevant socioeconomic constructs. Moreover, the age of the sample is appropriate, in light of studies demonstrating that socioeconomic differentials in health are pronounced at midlife.[16,17] Weaknesses of the WLS include the restriction of the sample to high school graduates, the omission of minorities, and the limited regional origin of the sample. Moreover, the present analysis is based on self-reports of general health, symptoms, and diagnosed conditions, not on medical findings of morbidity. We would especially discourage any generalization of the present findings to persons with less than a high school diploma or to minority populations.

Socioeconomic Measures

The analyses center on educational attainment and seven occupation-based measures. Educational attainment is study members' self-reported years of formal schooling (for men $\bar{0}$ = 13.95, s = 2.49, and for women $\bar{0}$ = 13.13, s = 1.86). This continuous measure contains more information and consequently has more statistical power than a discreet measure dichotomized at an arbitrary cutoff such as high school or college completion. With greater power the continuous measure increases the probability of detecting a significant association between education and health outcomes, and therefore also serves as a better control variable to examine whether occupational standing has a unique association with health net of educational attainment.

Consistent with the earlier WLS waves, the four scalar occupational standing measures in the 1992-3 data are based on the 1970 Census Occupational Classification; these measures, while dated, are suitable for the purposes of this study in light of evidence that change in the relative standing of occupations occur at only glacial speed.[18,19] The first measure is occupational

prestige[20] (for men $\bar{x}$ = 46.20, s = 13.89, and for women $\bar{x}$ = 43.63, s = 13.29), a concept that may measure either a relationship of deference or derogation between role incumbents, or the general desirability or goodness of an occupation. It is a statistically robust measure. Prestige ratings show little variation regardless of how people are asked to rate occupations,[21] whether occupations are rated by men or women,[22] the race of raters,[23] the historical period in which ratings were obtained,[18,19,24] or raters' location in the social hierarchy within industrialized nations and most of the non-industrialized world.[25,26]

The second occupational measure is the Duncan socioeconomic index (SEI) of occupations[27] (for men $\bar{x}$ = 51.92, s = 24.40, and for women $\bar{x}$ = 49.09, s = 20.76), as updated for the 1970 Census occupational titles.[28] Each occupation has a SEI score that is the weighted combination of "occupational education," which is the percentage of an occupation's incumbents who had one or more years of college education in the 1970 census, and "occupational income," which is the percentage of an occupation's incumbents who earned $10,000 or more in 1969. In general, prestige and SEI measures are highly correlated, but the higher criterion validity of the Duncan SEI (and similar measures) has led to their relatively greater acceptance and use in the field.[29-31] Although the SEI does not directly represent job characteristics or work processes, it does reflect both typical job requirements (education) and rewards (remuneration).

The final two scalar measures are the individual components of the SEI index: occupational education and occupational income. Recent analyses of socioeconomic mobility support the surprising conclusion that occupational education alone serves as a more powerful indicator of socioeconomic standing than occupational income, occupational prestige, or occupational SEI.[30-32] This study investigates whether the same finding holds in analyses of health.

Following Hauser and Warren,[30] we re-expressed each percentage using a started logit transformation:

$$\ln\left(\frac{y_i \% 1}{100 \& y_i \% 1}\right)$$

where y_i is the percentage of workers above the threshold. This symmetric transformation eliminates the extreme or undefined values of the log transform that would otherwise occur when the observed percentage is at or near 0 or 100.[33] In regard to occupational education 0 = -0.61, s = 1.76 for men, and for women 0 = -0.61, s = 1.49. In regard to occupational income 0 = -0.62, s = 1.17 for men, and for women 0 = -2.13, s = 1.32.

The remaining three categorical measures of social standing appear in Table 1. The first is Blau and Duncan's (1967) 17-category classification of occupation, industry, and class-of-worker (hereafter referred to as "Group II"). The distribution shows the expected high concentration of male and female WLS graduates in professional and salaried managerial occupations, as well as a concentration of female graduates in clerical work.

The two categorical measures are social class indices developed by Wright and Erikson-Goldthorpe. These are measure of social class, which differ from measures of socioeconomic status in that they are theoretically premised upon ongoing economic interactions rather than personal characteristics or a kind of status.[9] These omnibus measures of social class differ from the others empirically because they require additional information about supervisory or managerial activity or size of establishment; these questions were asked of a random half-sample of the Wisconsin Longitudinal Study in the 1992-93 telephone interviews. Wright's[34] classification uses information about self-employment, number of employees, authority (based on managerial and

supervisory responsibilities), and expertise (based on intermediate occupation categories). With this information Wright provides three alternative guidelines to classify workers using either "expansive," "intermediary," or "restrictive" criteria, and the findings in Table 3 reflect the use of "intermediary" criteria. For the total sample the percentage distributions indicate that the WLS respondents have a slightly higher social class distribution than all American workers. This reflects the fact that the WLS sample does not include high school dropouts and that the social class assessment of the WLS graduate occurred when they were aged 53-54, a life stage when occupational authority and expertise peaks.

The final categorical measure of social standing is Erikson and Goldthorpe's social class index.[35] Like Wright's classification, the Erikson-Goldthorpe schema uses information on occupation, self-employment, number of employees, and supervisory status, and the full set of questions to measure these concepts was asked only of a random half-sample of the WLS. While occupation and self-employment are operationalized in a relatively straightforward manner, guidelines for the measurement of supervisory status are less clear. In this study we rely on respondents' self-reported supervisory status and the number of employees in their work organization. Study members with (a) **no supervisory status** are those who have no co-workers and/or report that they are in a "non-management/non-supervisory" position in their work organization, those with (b) **moderate supervisory status** are respondents who report a "supervisory" or "managerial" position in a work organization with one to nine employees or a "supervisory" position in an organization with 10 or more employees, and those with (c) **high supervisory status** are respondents who report a "managerial" position in a work organization with 10 or more employees. As with the Wright measure, results using the Erikson-Goldthorpe

typology indicate that the social class standing of WLS respondents is higher than all American workers.[36]

In order to maximize coverage, persons who were not currently working (unemployed, retired, or otherwise out of the labor force) were classified by reports about their most recent job. For this reason, few individuals lacked occupational data, and these individuals were excluded from the analysis (24 men and 338 women). WLS graduates who responded to the telephone interview, but not to the mail interview were excluded from the analysis because self-reported health data were not available. However, there differences in the SES indicators between graduates who responded only to the telephone interview and those who responded in both surveys were small (the two samples did not differ by more than 5% on the mean level of any SES indicator), and we do not believe that these differences affect the validity of our analyses in any important way.

The occupational measurements in the WLS are of high quality and reliability.[30,37] Interviewers were trained in occupation coding in order to improve their understanding of the required information. Completed interviews were checked for the quality of occupation reports, and incomplete reports were returned to the field. Coders were trained in detailed coding procedures used by the U.S. Bureau of the Census, and a high level of coding reliability was maintained through intensive oversight, verification, and retraining.

Measures of Health

The analysis focuses on three self-reported indicators of health. The first is self-rated overall health, an independent predictor of mortality[38] that is actually a stronger predictor of mortality than physician-assessed health.[39] It is gauged by the question "How would you rate your health at the present time?" To handle the skewed distribution of the responses, the analysis

divides all responses into two groups and predicts those who report either “very poor,” “poor,” or “fair” overall health in comparison to those who report either “good” or “excellent” overall health.

The analysis also focuses on more specific self-reported physical symptoms and medical conditions. Presented with a list of physical symptoms (which appear in Table 2), study members indicated if they experienced any of them daily or more often in the past six months. They also indicated whether a medical professional told them that they had any of a list of medical conditions (which in appear in Table 3).

Results

Throughout the analysis, we have evaluated estimated effects in two ways. First, we provide standard measures of statistical significance. Second, we have used the Bayesian Information Criterion (BIC), suggested by Raftery.[40] BIC is a penalized chi-square statistic, where the penalty is the product of the degrees of freedom and the natural log of the sample size (BIC = L^2 - $df \times \ln(N)$). Positive values of BIC suggest that there is evidence favoring the model; values of BIC larger than 6 suggest that there is strong evidence in favor of the model. Basically, the use of BIC compensates for two facts: that many of our estimates are based on large enough samples to produce trivial, but nominally significant findings, and that some of our occupation and class variables have many categories.

Overall Health and Physical Symptoms

Table 2 reports analyses of self-reported overall health and physical symptoms for men and women. The first column reports prevalence rates in the WLS and the second and third columns report results of bivariate logistic regressions of overall health and physical symptoms on educational attainment. Results regarding poor overall health were consistent with previous work

in this area and showed that it was significantly over represented among people with lower education (Table 2; row 1, columns 2-3 in men's and women's analyses). The association is stronger in analyses of men; the Chi-Square statistic for the men's model was approximately three times larger than the score for the women's model, even though the analysis of men was based on a smaller sample size. The stronger significance level for men resulted because the slope of their general health on educational attainment was about 50 percent larger than that for women (Table 2, row 2).

The analyses of physical symptoms showed that people with lower education reported more health problems on almost all symptoms (Table 2, column 2), although the association of these reports with educational attainment reached statistical significance in only a minority of cases. For both men and women the symptoms of "aching muscles" and "back pain/strain" had "strong" or "very strong" associations with educational attainment, as indicated by high BIC values. On the one hand, these findings are consistent with those reported by House, et al., [17] who combine these symptoms along with others to form a health index that is significantly related to SES. On the other hand, the fact that these symptoms were so much more strongly related to educational attainment than other symptoms that accompany them in health indices (e.g. urination problems) suggests that they may warrant separate, individual analysis, at least in studies centering on middle adulthood.

Few additional symptoms were significantly related to educational attainment. "Excessive sweating" was the only other symptom to show a significant association with a high BIC value, and it was significant for women only. "Stiff/swollen joints" – a symptom conceptually similar to "aching muscles" and "back pain/strain" – was significant for both women and men using conventional criteria, but not when using BIC. The remaining symptoms related to educational

attainment were “numbness” and “shortness of breath,” both of which were significant only by conventional criteria and only for men.

Up to this point in the analyses educational attainment has been the sole SES indicator in the prediction of physical symptoms; the study turned next to examine if measures of occupational standing contributed further information. Columns 4-10 of Table 2 report the improvement in model fit that resulted when occupation-based measures were each separately included with educational attainment in the prediction of overall health and physical symptoms. For example, occupational prestige and educational attainment together as predictors of overall health resulted in a model with a chi-square that was 1.9 larger than a model using educational attainment alone (Table 2; row 1, column 4), an improvement that was not statistically significant.

In general, occupational standing contributed little additional information to the prediction of physical symptoms. In the analyses of men the one symptom of “aching muscles” was significantly related to occupational standing net of educational attainment, as indicated by the high BIC value. Notably, for this symptom it was occupational education that made the strongest contribution of all occupation-based measures, suggesting that its superiority to traditional SEI measures generalizes beyond the study of social stratification to some health outcomes. In the analyses of women the one symptom of “excessive sweating” was significantly related to occupational standing net of educational attainment, when using BIC values to assess significance levels. As with the analyses of men, occupational education made a significant contribution to the prediction of this symptom, but so too did the measures of occupational prestige and occupational income.

The use of conventional levels of significance instead of the more rigorous BIC would suggest that two additional physical symptoms among men, “stiff/swollen joints” and “visual

problems," also have associations with occupational standing net of educational attainment. Five out of the seven occupational standing measures were significantly related to these physical symptoms net of educational attainment, showing that the association was robust, albeit small.

Overall, while educational attainment and occupational standing had mutually unique relationships with physical symptoms in a few cases, these were the exception and not the rule. Strong associations with occupational standing net of educational attainment occurred for only one out of fifteen physical symptoms in the analysis of men, for one out of fifteen symptoms in the analysis of women, and did not occur at all in the analysis of self-reported overall health. Further, independent associations with occupational standing were weak or non-existent when using social class measures; the Wright social class index did not bear a significant association with any of the physical health symptoms net of educational attainment, and use of the Erickson-Goldthorpe social class index produced results that were only nominally significant. Taken as a whole these results suggest that estimates of the association between SES and physical symptoms based on the indicator of educational attainment alone would not change significantly by taking additional information on occupational standing into account, with the exception of a few important symptoms noted above.

Medical Conditions

Table 3 reports parallel analyses for self-reported medical conditions. The first column reports their prevalence rates in the WLS and the second and third columns report results of bivariate logistic regressions of medical conditions on educational attainment. Study members with lower education reported higher rates for almost every medical condition, and more of these associations reach statistical significance than in the analysis of physical symptoms.

For men the inverse association of health with educational attainment has significant BIC values for the conditions of "circulation problems," "high blood pressure," and "arthritis/rheumatism." Using the less rigorous conventional criteria for statistical significance, the inverse association is also significant among men for the conditions of "bronchitis/emphysema," "heart trouble," "serious back trouble," "ulcer," and "diabetes."

For women the inverse association had a significant BIC value only for the condition of "high blood pressure." By conventional standards of statistical significance, also significant among women were the associations of educational attainment with "arthritis/rheumatism," "allergies," "heart trouble," "ulcer," and "colitis." One anomalous finding is that allergies were significantly more likely to be reported by women and by men with higher education.

The remaining analyses examined whether measures of occupational standing contributed information to the prediction of medical conditions net of educational attainment. Columns 4-10 of Table 3 report the improvement in model fit that resulted when occupation-based measures were each separately included with educational attainment in the prediction of medical conditions. As in the analysis of physical symptoms, information on occupational standing contributed little additional information. No outcome exhibited a "strong" association with occupational standing net of educational attainment in either the analyses of men or women, although the outcome of "arthritis/rheumatism" among men and "diabetes" among women would meet the criteria for statistical significance using less rigorous conventional criteria. Consistent with the analyses of physical symptoms, these results suggest that measures of occupational standing add little to the prediction of medical conditions net of educational attainment, with a few important exceptions.

Discussion

This study set out to compare several measures of socioeconomic status to distinguish the ones most appropriate for studying and monitoring health outcomes. Data come from the most recent wave of data collection from the Wisconsin Longitudinal Study, when the birth cohort was 53 and 54 years of age. The study is especially well-suited to compare SES measures in their relation to health for two main reasons. First, the data include multiple measures of socioeconomic standing and social class, providing a unique opportunity to compare them directly. Second, the analyses focus on a birth cohort at an age when the association between SES and health outcomes is most pronounced,[17] and thus a developmental stage when the association is of particular theoretical and policy interest.

Three main research questions motivated this study. The first was whether health outcomes that have a relationship with occupational standing net of educational attainment are the exception or the rule. The analyses indicate that they are the exception, at least among the outcomes of this study. Among the 30 outcomes analyzed, only two had a net association with occupational standing that qualified as "strong" using the Bayesian Information Criterion (BIC). These results suggest that studies focused solely on documenting and monitoring the association between SES and health over time will in many cases not require the additional expense of collecting and coding measures of occupational standing.

The second research question called for an examination of the relative power of different occupational standing measures to predict health outcomes. The one measure that met the BIC cutoff for a "strong" relationship with both men's and women's health net of educational attainment was occupational education, providing further evidence that this measure may outperform SEI and prestige as an indicator of social standing.[30,32] In contrast, measures of social class had little or no association with health outcomes. After controlling the association with educational attainment,

the Erickson-Goldthorpe class measure had only nominally significant relationships with a few health outcomes, and the Wright measure was not significantly related to any of them. Analyses not shown examined the two other operationalizations of social class suggested by Wright,[34] and these too had no significant relationships with any of the health outcomes of this study, net of educational attainment. These results suggest that the recent call to include measures of social class in major U.S. health surveys[3] will first require extensive revisions of existing indices – in their current form they would lead to the conclusion that health is essentially unrelated to social class net of educational attainment, at least for the health outcomes in this sample.

For the final research question the analyses examined whether different types of health outcomes were more likely to have an association with occupational standing net of educational attainment. While in most cases the associations were not significant, the exceptions are important ones. In the analyses of men the exception was the physical symptom "aching muscles," which had a similar, although only nominally significant, association in the analyses of women. These results suggest that "aching muscles" and similar symptoms may have an association with occupational standing that is substantively and empirically different from the other health outcomes that commonly accompany it to form an index of general health,[17] and it may consequently warrant greater individual attention. In the analyses of women the exception was "excessive sweating." To our knowledge this symptom has received little attention in the literature and warrants follow-up investigations to examine whether it is a promising candidate to include in epidemiological and sociological studies on the interplay between social structure and individual health.

Summary

It is important to reiterate the limitations of the Wisconsin Longitudinal Study, and caution should be taken in generalizing these findings to other populations. Again, the sample is limited to

high school graduates, reducing the variability in educational attainment and curtailing the influence of schooling on health relative to that of other variables. Also, the sample contains very few minorities, and its origins are in the upper Midwest. Finally, the analysis is based on self-reports of general health, symptoms, and diagnosed conditions, not on medical diagnoses.

With these caveats in mind, the analyses suggest that the simple indicator of educational attainment provides an explanation for the overall association between SES and many health outcomes that is not further improved upon by taking occupational standing into account, with the important exceptions noted above. While occupation may sometimes serve as an important mechanism linking education and health, these results suggest that studies interested in only monitoring or controlling the overall relation between SES and health outcomes may in many cases not require information on occupational standing once the influence of educational attainment is adequately taken into account.

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Table 1: Group II and Social Class Distributions of WLS Sample

	– Men – n = 3137 %		– Women – n = 3344 %
Group II Classification			
Professional, technical and kindred, self-employed and without pay	3.5	2.4	
Professional, technical and kindred, salaried		21.1	22.2
Managers, officials and proprietors, salaried		17.2	11.1
Managers, officials and proprietors, self-employed and without pay		5.9	2.4
Sales workers, not retail trade		6.4	3.0
Sales workers, retail trade		1.5	3.5
Clerical and kindred workers		6.4	33.0
Craftsmen, foreman and kindred workers, manufacturing	7.6	0.8	
Crafts, construction		3.8	–
Crafts, all other		5.7	1.1
Operatives, manufacturing	7.4	3.9	
Operatives, all other		3.7	1.7
Service and private household		4.8	12.9
Laborers, manufacturing		0.5	–
Laborers, all other		1.2	0.8
Farmers and farm managers		3.0	1.2
Farm laborers and farm foremen		0.3	–
Total		100.1%	100%

Table 1 (continued): Group II and Social Class Distributions of WLS Sample

Measure	– Men – n = 1534 %	– Women – n = 1617 %
Wright's Social Class Typology		
Capitalists	3.5	1.4
Small employers	9.9	5.5
Petty bourgeoisie	3.7	3.5
Expert managers	13.7	3.2
Expert supervisors	5.7	2.6
Experts	3.0	2.4
Skilled managers	7.2	4.7
Skilled supervisors	11.2	9.3
Skilled workers	13.2	11.6
Nonskilled managers	3.8	4.2
Nonskilled supervisors	7.0	12.8
Nonskilled workers	18.1	38.9
Total	100%	100.1%
Erikson-Goldthorpe Social Class Typology		
Higher- and lower-grade professionals	49.9	48.5
Routine non-manual employees	3.5	31.5
Petty bourgeoisie	7.2	4.8
Farmers	3.6	1.6
Skilled workers	21.9	4.0
Non-skilled workers	13.3	9.3
Farm workers	0.5	0.2
Total	99.9 %	99.9%

Table 2: Self-Reported Physical Health Outcomes: Prevalence in the WLS and Association with SES Measures

Physical Symptom	% n=3049	Bivariate Logistic Regression of Symptom on Years of Education: ß n=3049	Model Chi-Square[a] n=3049	Improvement to model chi-square when occupational measure is included with years of education as a predictor of physical symptom: Occ. prestige[a] n=3049	Occ.. SEI[a] n=3049	Occ. education[a] n=3049	Occ. income[a] n=3049	Group II[b] n=3049	Erickson-Goldthorpe[b] n=1494	Wright[b] n=1494
MEN										
Poor overall health	11.6	-0.17	41.9***	1.9	2.1	3.6	5.8	14.1(16)	4.7(6)	6.5(11)
Ringing in ears	11.0	-0.03	2.1	0.8	0.1	0.9	0.1	36.2(16)^	17.9(5)^	10.0(11)
Back pain/strain	8.2	-0.16	28.9***	0.0	1.0	0.8	0.7	16.6(15)	2.2(5)	10.5(11)
Stiff/swollen joints	7.5	-0.07	5.1^	1.5	6.6^	1.7	5.6^	40.0(15)^	23.0(5)^	13.7(11)
Aching muscles	7.0	-0.16	23.5***	5.2^	8.3^	16.8**	7.0^	31.6(15)^	17.0(5)^	11.2(11)
Trouble sleeping	5.1	-0.05	1.8	1.3	1.0	1.3	0.0	10.1(14)	1.5(6)	10.6(10)
Lack of energy	4.6	-0.06	2.5	0.3	0.1	0.1	0.1	10.0(14)	5.1(4)	14.8(10)
Skin problems	4.5	-0.03	0.7	0.4	0.9	0.6	2.4	10.2(15)	3.4(4)	10.0(11)
Visual problems	3.8	-0.06	2.0	1.7	5.1^	4.5^	9.8^	28.4(14)^	17.8(4)^	15.5(11)
Urination problems	3.6	0.03	0.5	1.2	1.3	0.9	0.0	10.1(15)	0.6(5)	9.9(10)
Numbness	3.3	-0.13	8.4^	0.1	1.3	0.7	0.2	12.7(14)	0.6(3)	14.3(10)
Fatigue/exhaustion	3.1	-0.09	3.8	0.1	0.1	0.8	0.0	10.6(15)	5.4(6)	7.2(10)
Shortness of breath	3.0	-0.14	8.8^	0.6	2.5	0.3	3.5	16.3(14)	3.0(5)	2.6(9)
Headache	2.7	-0.05	1.1	0.9	0.1	0.6	1.8	10.9(14)	2.0(5)	12.1(11)
Repiratory problems	1.8	-0.03	0.2	0.7	0.3	3.7	1.7	12.6(12)	1.8(4)	4.3(7)
Excessive sweating	1.5	-0.03	0.3	0.3	0.0	0.1	0.3	9.5(13)	0.3(4)	7.9(8)

^ p<.05 using conventional Chi-Squared criteria.

* p<.05 using conventional Chi-Squared criteria, and association is "positive" using Bayesian Inference Criteria

** p<.05 using conventional Chi-Squared criteria, and association is "strong" using Bayesian Inference Criteria

*** p<.05 using conventional Chi-Squared criteria, and association is "very strong" using Bayesian Inference Criteria

a Measure has one degree of freedom.

b Degrees of freedom for measure reported in parentheses. In some cases small cell sizes prohibited the flagging of all categories.

Table 2 (continued): Self-Reported Physical Health Outcomes: Prevalence in the WLS and Association with SES Measures

		Bivariate Logistic Regression of Symptom on Years of Education		Improvement to model chi-square when occupational measure is included with years of education as a predictor of physical symptom						
Physical Symptom	% n=3230	ß n=3230	Model Chi-Square[a] n=3230	Occ. prestige[a] n=3230	Occ. SEI[a] n=3230	Occ. education[a] n=3230	Occ. income[a] n=3230	Group II[b] n=3230	Erickson-Goldthorpe[b] n=1560	Wright[b] n=1560
WOMEN										
Poor overall health	10.8	-0.12	13.8*	2.8	2.3	1.6	0.4	21.5(13)	7.0(6)	8.8(11)
Stiff/swollen joints	13.4	-0.07	5.4^	0.0	0.3	0.6	0.1	17.8(13)	7.7(5)	8.4(11)
Aching muscles	11.7	-0.16	22.8***	2.8	5.2^	2.1	2.2	17.6(12)	6.9(5)	8.1(11)
Back pain/strain	10.1	-0.13	14.2**	0.1	1.5	0.3	5.1^	10.7(13)	1.9(5)	8.0(11)
Lack of energy	7.8	-0.05	1.9	0.1	0.8	0.0	0.1	18.5(12)	11.3(6)	10.2(11)
Trouble sleeping	7.7	-0.05	2.1	3.3	2.6	2.5	0.5	10.6(13)	4.7(6)	15.5(11)
Fatigue/exhaustion	6.3	-0.07	2.6	0.1	1.6	0.0	0.1	23.8(12)^	8.7(5)	6.3(11)
Excessive sweating	5.0	-0.20	15.5**	13.3**	9.6^	15.4**	23.2***	28.6(12)^	9.8(5)	14.6(8)
Ringing in ears	4.9	0.01	0.1	2.8	2.0	2.6	4.9^	17.8(11)	7.6(4)	13.2(10)
Skin problems	4.4	-0.08	2.6	0.5	1.6	0.7	0.6	6.9(13)	5.5(5)	7.5(10)
Visual problems	4.3	-0.08	2.6	2.6	1.0	0.9	0.0	8.7(12)	2.9(5)	12.7(11)
Headache	3.8	-0.06	1.2	0.3	0.2	0.1	0.1	8.4(12)	4.7(4)	12.5(11)
Numbness	3.5	-0.10	3.2	1.7	1.2	0.6	0.4	10.7(12)	3.5(5)	7.1(8)
Urination problems	2.9	-0.05	0.7	0.0	0.1	0.1	0.2	8.4(10)	9.7(3)	6.2(10)
Shortness of breath	2.6	-0.10	2.5	0.0	0.5	0.2	0.0	7.9(12)	7.1(4)	6.5(11)
Repiratory problems	1.6	-0.06	0.6	0.5	0.4	2.4	0.0	8.9(8)	1.8(3)	13.4(9)

^ p<.05 using conventional Chi-Squared criteria.

* p<.05 using conventional Chi-Squared criteria, and association is "positive" using Bayesian Inference Criteria

** p<.05 using conventional Chi-Squared criteria, and association is "strong" using Bayesian Inference Criteria

*** p<.05 using conventional Chi-Squared criteria, and association is "very strong" using Bayesian Inference Criteria

a Measure has one degree of freedom.

b Degrees of freedom for measure reported in parentheses. In some cases small cell sizes prohibited the flagging of all categories.

Table 3: Self-Reported Medical Conditions: Prevalence in the WLS and Association with SES Measures

		Bivariate Logistic Regression of Condition on Years of Education	Improvement to model chi-square when occupational measure is included with years of education as a predictor of medical condition						
Medical Condition	% n=3068	ß n=3068	Model Chi-Square[a] n=3068	Occ. prestige[a] n=3068	Occ. SEI[a] n=3068	Occ. education[a] n=3068	Occ. income[a] n=3068	Group II[b] n=1497	Erickson-Goldthorpe[b] n=1497	Wright[b] n=1497
MEN										
High blood pressure	23.3	-0.07	14.9**	2.4	0.2	0.4	0.1	20.2(16)	2.4(6)	17.9(11)
Arthritis/rheumatism	17.9	-0.10	26.3***	6.5^	12.3*	8.9^	5.9^	27.1(15)^	13.0(5)^	11.4(11)
Allergies	9.4	0.08	10.2*	0.7	1.6	1.4	2.1	13.2(14)	5.7(6)	10.0(11)
Serious back trouble	9.3	-0.07	7.6^	0.6	4.6^	9.7^	5.4^	21.2(15)	4.1(5)	6.6(11)
Heart trouble	7.2	-0.06	4.8^	0.2	1.3	0.1	0.2	9.8(15)	1.6(6)	2.7(11)
Diabetes	4.5	-0.11	8.2^	0.2	1.4	0.0	1.9	12.8(14)	2.8(6)	8.7(11)
Asthma	3.6	0.07	3.2	1.5	1.9	0.2	0.9	14.4(13)	7.3(5)	3.4(9)
Circulation problems	3.6	-0.18	16.2**	1.5	0.0	0.9	3.2	8.7(14)	4.0(5)	17.0(10)
Kidney/ bladder probs.	3.0	-0.02	0.1	1.4	1.5	1.9	3.2	8.5(14)	1.8(5)	13.3(11)
Ulcer	2.8	-0.14	7.7^	0.2	0.8	0.3	0.7	13.0(13)	1.8(5)	4.1(10)
Bronchitis/emphysema	2.2	-0.11	4.4^	5.6^	4.3^	3.0	3.4	14.6(14)	9.0(5)	12.5(6)
Cancer	1.4	-0.04	0.3	4.9^	3.3	1.4	0.5	8.4(14)	6.1(4)	21.5(8)^
Colitis	1.1	-0.00	0.0	1.4	0.2	0.1	0.2	10.9(13)	3.0(3)	5.7(8)

^ p<.05 using conventional Chi-Squared criteria.

* p<.05 using conventional Chi-Squared criteria, and association is "positive" using Bayesian Inference Criteria

** p<.05 using conventional Chi-Squared criteria, and association is "strong" using Bayesian Inference Criteria

*** p<.05 using conventional Chi-Squared criteria, and association is "very strong" using Bayesian Inference Criteria

a Measure has one degree of freedom.

b Degrees of freedom for measure reported in parentheses. In some cases small cell sizes prohibited the flagging of all categories.

Note: analyses of men do not include the medical condition "anemia" because the small number of reported cases (n=15) precluded detailed analysis.

Table 3 (contined): Self-Reported Medical Conditions: Prevalence in the WLS and Association with SES Measures

Medical Condition	% n=3259	Bivariate Logistic Regression of Condition on Years of Education: ß n=3259	Model Chi-Square[a] n=3259	Improvement to model chi-square when occupational measure is included with years of education as a predictor of medical condition: Occ. prestige[a] n=3259	Occ. SEI[a] n=3259	Occ. education[a] n=3259	Occ. income[a] n=3259	Group II[b] n=3259	Erickson-Goldthorpe[b] n=1580	Wright[b] n=1580
WOMEN										
Arthritis/rheumatism	27.0	-0.06	6.6^	0.3	2.5	1.3	6.1^	24.1(13)^	2.5(6)	18.5(11)
High blood pressure	19.6	-0.13	27.3***	8.3^	3.3	1.6	4.7^	30.9(13)^	2.4(6)	14.3(11)
Allergies	18.4	0.07	9.5^	0.3	0.1	0.1	1.1	12.1(13)	12.1(5)^	10.0(11)
Serious back trouble	8.2	-0.04	1.4	3.8	7.3^	3.4	8.2^	19.4(13)	1.1(5)	13.8(11)
Circulation problems	5.9	-0.07	3.2	0.5	1.7	0.3	0.0	12.0(13)	1.5(5)	13.4(10)
Asthma	5.5	0.04	1.2	0.7	0.2	1.5	0.1	12.5(12)	8.4(4)	15.7(10)
Kidney/bladder probs.	5.3	-0.08	3.3	1.0	5.0^	7.0^	5.3^	22.2(13)	5.0(5)	14.3(11)
Anemia	4.0	0.04	0.8	0.5	0.6	0.7	0.1	10.0(11)	7.1(4)	12.7(9)
Bronchitis/emphysema	4.0	-0.04	0.6	0.4	0.5	0.5	1.3	22.8(9)^	3.0(3)	10.7(10)
Heart trouble	3.9	-0.17	8.9^	0.1	0.1	0.0	0.0	13.9(13)	12.5(5)^	10.1(11)
Diabetes	3.5	-0.09	2.5	4.6^	11.2*	5.5^	0.2	16.3(12)	6.7(4)	9.0(10)
Ulcer	3.3	-0.19	9.4^	0.4	1.7	2.1	2.8	13.0(9)	2.8(4)	4.4(8)
Colitis	3.1	-0.13	4.7^	0.7	1.3	0.6	3.4	9.8(11)	4.7(4)	9.9(8)
Cancer	3.0	0.07	1.8	0.3	0.0	0.7	0.0	9.0(10)	2.5(4)	11.1(10)

^ p<.05 using conventional Chi-Squared criteria.

* p<.05 using conventional Chi-Squared criteria, and association is "positive" using Bayesian Inference Criteria

** p<.05 using conventional Chi-Squared criteria, and association is "strong" using Bayesian Inference Criteria

*** p<.05 using conventional Chi-Squared criteria, and association is "very strong" using Bayesian Inference Criteria

a Measure has one degree of freedom.

b Degrees of freedom for measure reported in parentheses. In some cases small cell sizes prohibited the flagging of all categories.