Center for Demography and Ecology

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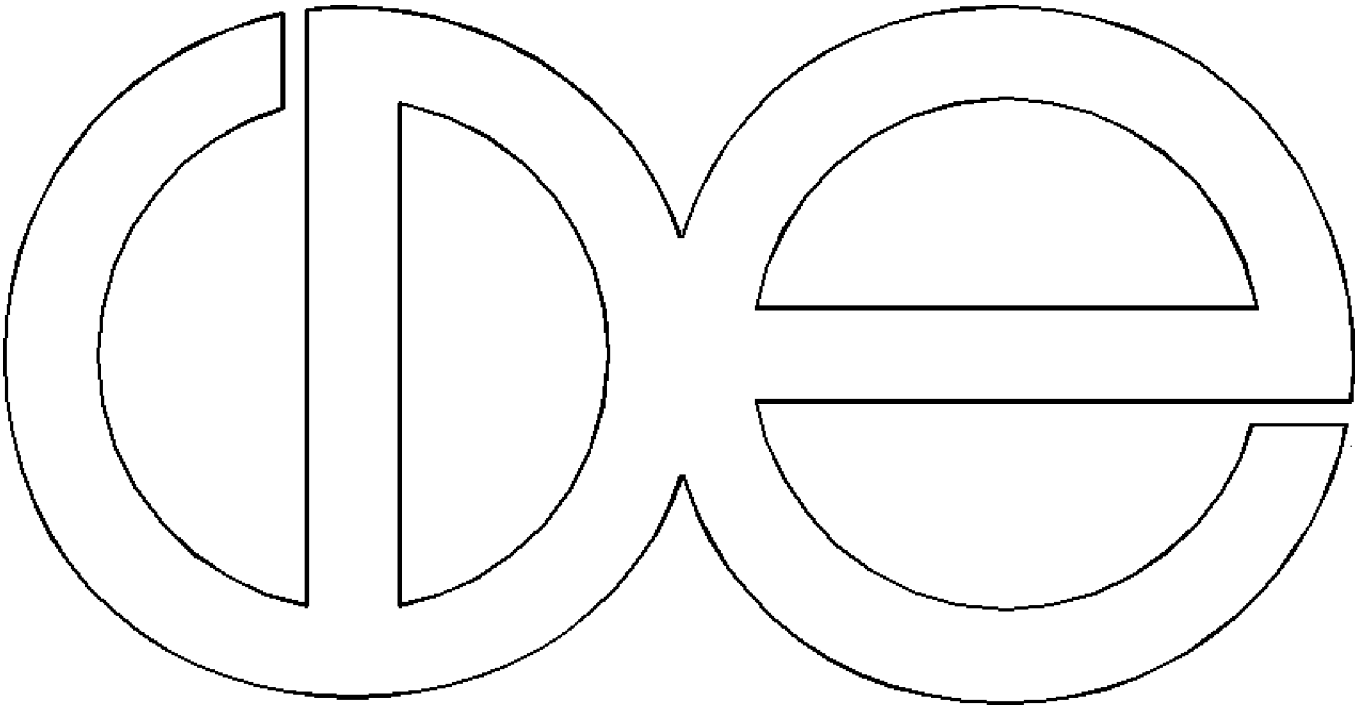
CDE Working Paper No. 96-04



Socioeconomic Differences in Hysterectomy: Evidence from the Wisconsin Longitudinal Study

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April 1996

CDE Working Paper 96-04

This research was supported by a FIRST Grant Award to the first author from the National Institute on Aging (R29AG12731) and by the John D. and Catherine T. MacArthur Foundation Research Network on Successful Midlife Development (MIDMAC). The Wisconsin Longitudinal Study (WLS) 1992-93 has its principal support from the National Institute on Aging (AG9775), with supplemental support from the National Science Foundation (SES-9023082), MIDMAC, the Spencer Foundation, and the Graduate School of the University of Wisconsin-Madison. The WLS was designed and carried out at the Institute on Aging and Center for Demography and Ecology at the University of Wisconsin-Madison under the direction of Robert M. Hauser. The authors thank Robert M. Hauser for his helpful comments on a previous version of this manuscript.

ABSTRACT

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Objectives: A large sample of midlife Wisconsin women followed longitudinally for 35 years was used to evaluate the relative gross and net predictive value of multiple socioeconomic status (SES) indicators (including parental, spousal, and individual assessments) for the likelihood of undergoing hysterectomy.

Methods: Data from a representative sample of Wisconsin Longitudinal Study 1957-93 (WLS) women respondents (N=3,326) who were last interviewed at about age 53-54 were analyzed using multivariate logistic regression.

Results: Women's own occupational status and family net worth were significant net predictors of hysterectomy. A significant bivariate association of education with hysterectomy was not accounted for by controlling for mental ability. Education was no longer a significant predictor when adjustment was made for occupational status.

Conclusions: These results suggest that educational attainment among women and its influence on their likelihood of undergoing hysterectomy is not due to more intrinsically able women taking better care of their health, but more educated women having opportunities for higher status/quality employment and its benefits. Measures of women's own occupational status and wealth should be included in future public health data surveys.

Socioeconomic Differences in Hysterectomy:

Evidence from the Wisconsin Longitudinal Study

Introduction

There is growing evidence that lower socioeconomic status (SES) women are more likely to undergo a hysterectomy during their lifetime than higher socioeconomic status women.[1,2] This association is consistent with a substantial accumulation of evidence that lower SES is associated with poorer health outcomes overall for both women and men.[3,4,5,6,7,8,9,10]

Undergoing major surgery is a significant, expensive, and often traumatic life course event. Yet one procedure alone--hysterectomy--brings more than one in three American women into major surgery by age 60.[11] Astonishingly, this rate of uteri removal far exceeds that of any other country in the developed world. While the prevalence of hysterectomy in the 1980s at age 55-59 was 37% in the United States,[11] it was only 14% in Sweden,[12] about 13% across six other European countries,[13] and 24% in Australia.[14] In the U.S. there are even significant differences in rates by region--the South having substantially higher rates than the Northeast[11]; regional differences have also been noted in England.[15]

Only about 11% of hysterectomies in the United States are due to cancer of the uterus. The vast majority of uterine removal takes place for conditions that can also be managed utilizing other techniques.[11,16,17] This fact, along with glaring national and regional rate variations, suggests social processes as well as biological processes play an important role in the pathway leading to a hysterectomy.

Using Behavioral Risk Factor Surveillance data from fifteen states along with the District of Columbia, Kjerulff, Langenberg, and Guzinski[1] found cross sectional associations between education and household income (examined separately) and hysterectomy. Specifically, these

researchers found uterine removal to be twice as likely for women with less than a high school education in contrast to those with a college degree or more, and about half again as likely among women with household incomes under $10,000 a year in contrast to women with household incomes over $35,000 a year in 1988.[1]

Meilahn, Matthews, Egeland, and Kelsey used data from 2,137 women aged 40-52 interviewed by telephone survey to examine characteristics of women who had undergone hysterectomies. In multivariate analyses they found that age, being African-American, having less than a college education, beginning menses before age 12, and having no children increased the risk of hysterectomy. Further examination of interaction effects indicated that it was only for whites, but not African-Americans that a higher education reduced the likelihood of hysterectomy. African-American women were also more likely to report a hysterectomy if they had no children in contrast to having children, but this relationship was not found among white women.[2]

One estimate of the national bill for the 670,000 hysterectomies performed in the U.S. in 1985 was about $3 billion.[18] As the bulk of the baby boom generation continues to traverse ages 30-49 years (highest hysterectomy rates are for women aged 40-44), even with a slight reduction in rates occurring since 1975,[19] absolute numbers as well as public and private costs of hysterectomies can be expected to remain high.

Which measures of SES predict health best? Different measures of socioeconomic status--for example, income, education, and occupational status--yield a roughly similar picture of health inequalities. Yet currently there is considerable public health debate about *which measure(s) of SES show the largest net associations with health* and whether it is important to evaluate more than one measure of SES when looking at SES and health differentials.[20,21,22] Examining the relative value of various measures of SES is an important epidemiologic issue since such understanding is critical 1) to most reliably and accurately chart SES and health differentials, 2) to

guide the search for proximate mechanisms underlying the association of SES with health,[23,24,25] and 3) to influence the design of national health surveys and of other national and local studies by identifying the most important SES measures in the health domain.

The U.S. vital statistics system, unlike vital statistics in several European nations, has not routinely reported public health data by socioeconomic status.[26] A recent conference (September 1994) sponsored by the National Institutes of Health (NIH) on "Measuring Social Inequalities in Health" signalled a growing awareness that socioeconomic differentials in health need to be considered a major public health concern in the U.S. and that previous measurement and analysis of these differentials has been inadequate.[26,27,28]

An additional aspect of the "which SES measures?" question is also whether the *same* SES measures are the most important predictors of health for different population groups, e.g., women vs. men, nonelderly vs. elderly, non-Hispanic whites vs. ethnic minority groups. In the case of women, for example, is it parents' status, spouse's status, or own status that is most critical in influencing health outcomes? Additionally, are marital status and history, household composition, and parenthood status important measures to incorporate when considering SES for women?[28]

Occupational status has been identified as one critical indicator of relative socioeconomic location in society and has been used extensively in analyses of socioeconomic differentials in men's mortality and morbidity, especially in Europe. However, the use of occupational status as an indicator of socioeconomic status for women has been plagued historically with difficulties stemming from 1) women's less-continuous labor force attachment due to life course periods devoted to childbearing, home production, and caregiving; and 2) the fact that occupational status indices have generally been constructed with reference only to relevant characteristics of men's jobs. These facts, together with women's underpaid, sex-segregated, and subordinate place in

most labor markets has made it "conventional" wisdom to use a husband's occupational status as a marker for his wife, even if she was, indeed, employed.

The "conventional" approach to using husband's occupational status for a woman has been severely criticized on several grounds. Feminists find it objectionable to have a woman's status ascribed as though she were a man's appendage.[29,30] Higher rates of nonmarriage and marital dissolution have led to longer proportionate periods of women's lives when they are likely to be unmarried.[31] Higher rates of female labor force participation have made some occupational history typical of the vast majority of women's lives, and continuous labor force participation typical for an ever-growing proportion of American women.[32] Although it has become increasingly possible to formulate and use measures of individual occupational status across the entire population of women, this approach is seldom taken.

Another problem with most analyses of women's rates of hysterectomy and socioeconomic status is their restriction to cross-sectional data where the hypothesis that reverse causality is taking place--that is, health is causing a downward drift in socioeconomic status indicators--cannot be ruled out. Although downward drift is less likely to be the case when educational attainment is the SES measure used for middle-aged and older adults (since education is usually completed in early adulthood), and the prospective evidence currently available suggests that this downward selection is not the dominant way the association operates,[33] it is still a methodological concern.

In brief, the primary purposes of this study were 1) to investigate several previously unexamined gross and net associations of SES with hysterectomy, 2) to conduct an expanded analysis of the relationship between SES and hysterectomy using longitudinal data where many SES measures are assessments made prior to the occurrence of a hysterectomy, and 3) to discuss the public health relevance of these results.

Methods

Data for this study came from the Wisconsin Longitudinal Study (WLS), a long-term study of a random sample of 10,317 men and women who graduated from Wisconsin high schools in 1957. Data were collected from the original respondents, their parents, or administrative records in 1957 to 1975. The WLS cohort of men and women was born around 1939; this places them about a decade ahead of the majority of the baby boom generation that continues to tax social institutions and public resources at each stage of life. For this reason, evidence from the WLS can be a rich resource for providing early indications of health trends and problems that will become important concerns as the larger baby boom cohort passes through its fifties.[34]

In 1992-93 the WLS located 10,031 (97.2%) of the original 1957 sample of 10,317 graduates either dead (N=576; 5.6%) or alive (9,455; 91.6%). Most respondents were 53 or 54 years old when interviewed in 1992-93. Hour-long telephone interviews were completed with 89.9% of living respondents (N=8,493); twenty-page mailback surveys were received from 82.3% of telephone respondents (N=6,877). Data from the mailback survey, therefore, includes a response rate of about 72.7% of living original sample (1957) respondents. The analytic sample (N=3,326) for the analyses reported here included female WLS 1992-93 mailback survey respondents who were also respondents in 1975, since socioeconomic status in 1975 (at about age 35-36) is used as a prospective predictor of hysterectomy status at age 53-54.

The WLS respondents represent a relatively advantaged component of the American population since they all completed high school in 1957, a time when about 25% of their Wisconsin birth cohort peers did not. They are almost all non-Hispanic whites, and have not had to face an additional burden of racial disadvantage. The population that the WLS graduate sample *does* represent, however--non-Hispanic high school graduates born around 1939-1940--includes approximately 66% of the current American population about that age.[35] Although it

might be considered a disadvantage to have some of the potentially most disadvantaged women from this birth cohort excluded from this study, in another respect, like the noteworthy Whitehall samples of British civil servants,[36] this sample represents an excellent opportunity to examine whether there is truly an SES *gradient* in health--that is, whether there are graded differences between even the highest SES women and those below them in SES, rather than only a divergence between the most severely disadvantaged and everyone else.[3,9] Additionally, an examination of SES differences in health for an exclusively non-Hispanic white sample allows us a clear opportunity to investigate whether race/ethnicity is an adequate proxy for socioeconomic status in public health statistics.

Female respondents to the WLS mailback survey received one of two versions of questions regarding women's health. In the first version, women were asked if they had gone through or if they were currently going through menopause. If they answered "yes," they were asked, "Was menopause induced or hastened by a hysterectomy (surgical removal of your uterus and/or ovaries)?" (yes or no). The second version asked directly, "Have you ever had surgery to remove your uterus and/or ovaries?" and elicited from respondents all surgeries that applied to them--i.e., surgery to remove one ovary, two ovaries, and/or their uterus. All respondents to the first form who indicated they had had menopause induced or hastened by a hysterectomy, and all respondents to the second form who indicated they had had their uterus surgically removed were coded as having had a hysterectomy. About 31% of WLS main respondent women age 53-54 reported having undergone a hysterectomy (see
Table 1 for descriptive statistics for all analysis variables). This proportion is comparable to a national estimate of about 34% of U.S. women ages 50-54 in 1985 who were estimated to have had their uteri removed.[11] It was expected that the WLS estimate might be a bit lower than the

national estimate since the WLS women are relatively advantaged educationally, and education has been previously found to be inversely associated with the likelihood of hysterectomy.[1,2]

Measures of *father's education* and *mother's education* were based on information provided by respondents in 1975 regarding their father's and mother's highest year of school completed. *Father's occupational status* was also reported by respondents in 1975 and is represented by the Duncan Socioeconomic Index (SEI) score for 1970-basis Census occupation and industry categories.[37] For this and many of the other continuous measures, quintile categories were constructed for this variable based on percentile cutpoints for the entire sample of WLS men and women. *Parents' income* was computed using information obtained from Wisconsin State tax files from 1957 to 1960. *Respondent's education* is based on respondent's report of the last year of completed schooling as of 1992-93 differentiating 1) those with only 12 years of high school education (the lowest attainment for this sample), 2) those obtaining 13-15 years, and 3) those with 16 or more years of education.

Mental ability is a measure of the respondent's intelligence, using scores from the Henmon-Nelson intelligence test which was taken by all respondents during their junior year of high school in Wisconsin (in 1956) and added to the WLS data from school records. By including a mental ability measure, this analysis aimed to better estimate the actual net effect of education above and beyond its association with personal differences in cognitive performance. (Ability and educational attainment are positively associated, r=.38.)

Respondent's occupational status 1975 was measured using the Duncan Socioeconomic Index (SEI) (1970 Census basis[37]) of respondent's reports of their current or last job at the time of the 1975 survey, when they were about 35-36 years old and prior in age to when the highest rates of hysterectomy occur--i.e., ages 40-44.[11] This measure was not causally prior to all of the reports of hysterectomy by the WLS women, but it is an assessment prior to the vast majority of

them (about 79%). Only 2.5% of the WLS women had never worked as of 1975 and thus could not be coded on this variable; these few female cases were flagged as "never worked" on a dichotomous variable included in the analyses. Having such complete coverage longitudinally with an occupational status variable for women is an exceptional feature of this study. Use of occupational status as a predictor of health is most typically done cross-sectionally; often unemployed women are eliminated from such analyses.

Spouse's occupational status 1975 was also based on a Duncan SEI (1970 Census basis) score for spouse's job reported in 1975. *Own income 1974* and *spouse income 1974* were based on respondent reports in 1975.

Net worth 1993 (family) was calculated by adding up the estimated value minus the outstanding debt respondents reported for themselves and their spouse across several categories of personal property (e.g., home, business, farm, automobiles) and other assets (e.g., savings, investments). This information was not collected in 1975, so a causally prior measure of net worth was not possible to construct with these data. We included net worth in our analyses in addition to income because it captures additional variation in affluence and life style that is missing from more constrained and volatile measures of yearly income and we wanted to consider it in an exploratory way for its potential relative predictive value as a SES indicator.[38] Eight categories of net worth were contrasted in these analyses (see Table 1 for categories).

Own home is a dichotomous measure based on whether the respondent reported owning (including paying on a mortgage) her own home in 1992-93. (Net worth of any home owned is included in the net worth measure.) Although this measure is not an assessment made prior to the occurrence of hysterectomy, it was included, too, to examine whether an association would emerge that would indicate it to be an important measure to include prospectively in future work.

Since *marital status* and marital history have been suggested as potentially relevant SES markers for women, we included two measures of marriage. One measure, *not married 1975*, serves both to indicate whether a respondent was married at about age 35-36 and also to flag individuals who would not have a measure of spouse's income or occupation in 1974/1975. Another measure of marriage is provided for about age 53 from the more recent telephone survey, *married 1993*, which together with the measure from 1975 provides some information about the importance of marital history for predicting hysterectomy.

Number of biological children was reported in the telephone survey in 1992-93. *Age at first birth* was computed from respondent responses to fertility history questions in 1975 and 1992-93. A variable for *3 children by age 24* was included in the analyses since it has been hypothesized and found to be the case, (at least in Australia), that doctors are more likely to recommend and perform hysterectomies for women who have had a number of children early and might be considered "finished" with childbearing.[14] These variables about timing and history of childbearing were included mainly as controls in this analysis since previous research has indicated that more children and a later age at first birth are associated with lower rates of hysterectomy.[14,39,40]

Logit regression models yielding maximum likelihood parameter estimates were used for all analyses. In each case, respondents who indicated they had undergone a hysterectomy by age 53-54 were contrasted to respondents who had not. Initially, individual predictors or a related cluster of predictors were examined. In the final model, all predictors were examined net of the effects of all the others. The highest category of SES was contrasted with lower categories in each case, to better evaluate the gradient SES hypothesis--that is, are there differences in health even at the higher end of the SES distribution? One-tailed tests of significance were used since

substantial prior evidence allowed us to hypothesize that higher socioeconomic status would be associated with a lower likelihood of hysterectomy.

Results

Table 2 displays the results of several models examining the relationship between multiple measures of socioeconomic status, mental ability, marital status, fertility history, and the likelihood of hysterectomy by age 53-54. Model 1 in each case reports the gross effects of single variable blocks (in terms of relative risk) on the likelihood of having a hysterectomy. Models 2, 3, and 4 report net effects for selected additional multivariate analyses. Model 5 provides net relative risk estimates for individual variables adjusting for all of the other analysis variables.

The bivariate SES analyses reported in the first column of Table 2 revealed that overall, respondent's childhood SES as captured by the parental SES measures--father's education, mother's education, father's occupational status in 1957, and parents' 1957 income--were not found to be robust predictors of hysterectomy. However, replicating previous investigations of education and hysterectomy,[1,2] the WLS women who had achieved a bachelor's degree or more education evidenced a significantly lower likelihood of having a hysterectomy in comparison to women with only a high school education; a trend effect was also found for the difference between women with a college degree and women with only some college. Again, it must be noted that another more disadvantaged category of educational attainment--less than high school--is not available or represented in this data, and it might well be expected that were women with less than high school included, they, would also be disadvantaged in comparison to women with a college degree.

As noted previously, we included in our analyses a rarely available good measure of *mental ability* to better estimate the net effect of *education* on hysterectomy. The question arises in previous findings of a negative association of higher educational attainment with hysterectomy:

is this effect due to higher mental ability, or is there some other process by which education makes a difference? When hysterectomy was regressed on mental ability alone, only one significant difference emerged: women in the middle of the ability distribution were about 11% more likely to have had a hysterectomy than women in the top ability quintile.

The WLS's exceptional coverage of occupational status allowed the opportunity to examine the effects of women's own occupational attainment on the likelihood of undergoing hysterectomy. The bivariate relative risks model indicated substantial differences. Women in the lowest quintile of occupational status were 24% more likely to have a hysterectomy than high occupational status women. Women in the second lowest quintile were 15% more likely to have a hysterectomy. Women who had never worked before age 35-36 were at the greatest risk: they were 34% more likely to undergo a hysterectomy.

The bivariate models for spouse's occupational status 1975, respondent's income 1974, spouse's income in 1974, and owning a home in 1993 did not evidence very strong associations with hysterectomy. Net worth in 1993, however, *did* yield several significant contrasts between women with the highest level of net worth and almost everyone else.

From the bivariate results we proceeded to examine selected multivariate models. An additional two-variable model (Model 2) examined the effects of mental ability and education net of each other. These results revealed that the negative association between having a college degree and hysterectomy remained virtually the same holding ability constant. This refutes the hypothesis that mental ability is the dominant process whereby education impacts the likelihood of hysterectomy.

Model 3 reports the result of regressing respondent's education, ability, and occupational status simultaneously on likelihood of hysterectomy to answer the question: Does education appear to influence the likelihood of hysterectomy through its effects on women's occupational

status and experience? The results of this multivariate analysis indicated that the answer to this question is yes, since when women's own occupational status was added to the model, the effects of education were reduced to nonsignificance while the significant differences between women in the highest occupational status and women in the lowest status jobs or who had never worked remained.

To consider yet one more potential step in the pathway, we estimated an additional intermediate model (Model 4) that added net worth to the regression, to evaluate whether the importance of women's occupational status for likelihood of hysterectomy might be explained by its influence on her family's accrual of assets and the security, control, and opportunities this provides. The results of Model 4 suggest that the importance of women's occupational status is *not* explained by its association with net worth, since in this model both occupational status and net worth continue to be significant and independent predictors of hysterectomy.

A final model (Model 5) that estimated effects for all of the analysis variables adjusted for all other variables confirmed that women's own occupational status and family net worth were the best net SES predictors of hysterectomy. Neither marital status at age 35-36 nor at age 53-54 showed critical associations with this health outcome. Fertility history showed relationships similar to those observed in previous work,[14,37] although multiple early births were not a significant predictor of hysterectomy for these women.

Discussion

The results reported here indicate that among numerous competing SES measures, a woman's *own educational attainment, own occupational status,* and *family net worth* have the most consistent beneficial effects on lowering her likelihood of hysterectomy. These are noteworthy findings because women's own occupational status and net worth are two of the *least* likely measures to be included in public health and epidemiologic surveys.[38]

Hierarchical logistic regression analyses revealed that selection on mental ability did *not* account for the education effect, yet education was no longer significantly associated with risk of hysterectomy when occupational status was added to a multivariate model. The life course pathway these estimates suggest is one where education may benefit women's health by providing them with the skills, credentials, and competence to fulfill socially respected occupational roles.

These results are significant because they indicate that even for a cohort of women who were in the very early vanguard of modern American feminism (i.e., they were among the better educated and about age 23-24 when Betty Friedan published *The Feminine Mystique* in 1963),[41] their own occupational status as measured in their mid-thirties was a significant factor in maintaining their reproductive organ health. As employment becomes more continuous and central to women's lives among younger birth cohorts, women's own occupational status may play an even larger role in determining women's health and medical outcomes. The relatively lower importance of childhood SES and spousal SES for predicting hysterectomy highlight the fact that women's own adult socioeconomic experience should not be underestimated for its impact on health outcomes.

More research is certainly called for to further understand the processes whereby occupational status contributes to a reduction in the likelihood of hysterectomy. It might be that higher occupational status employment is associated with more control, less stress, and more satisfaction. These psychosocial factors may lead to better health, including reproductive organ health--thereby reducing the need for hysterectomy surgery. It might also be that higher occupational status provides access to better medical care. Higher status women may receive more preventive screening which allows them to deal with reproductive organ problems (e.g., abnormal Pap smear results) sooner--before they become serious enough to necessitate surgery.[1] Also, higher occupational status women may be given more respect and offered more options for

treatment once illness is discovered.[16,17,40] Or it might be that higher occupational status gives women more practice and increased competence in dealing proactively and authoritatively with their doctors--making it less likely that they might be "pressured" into having a hysterectomy when other means of dealing with a medical situation might be possible.[16,40]

Although we are cautious about overinterpreting the association of our measure of current net worth with the prior occurrence of a hysterectomy, we still believe these results suggest further scrutiny of the more proximate mechanisms whereby net worth (above and beyond income, occupational status, education, and marital status) might also influence women's health. It is possible that wealth, more than income, reflects the gradation of social and economic security and status that provides substantial health benefits. Although the net worth of assets is more cumbersome to assess than earnings or income, it still may be valuable to consider further how it might more often be included in public health surveys that aim to provide data for a more adequate examination of how socioeconomic differentials are associated with health.

These results confirm the importance for those involved in developing public health surveys and doing health research to include multiple measures of socioeconomic status, including occupational status and wealth for women as well as men in epidemiologic, health, and social science surveys. Education is an important predictor of women's health, but it is premature to settle upon use of this measure of SES alone as adequate for guiding the study of how socioeconomic status impacts health.[20,38] Women's own occupational status was even more important in predicting hysterectomy than their father's or their spouse's occupational status. In previous research examining other health outcomes, women's occupational status was also found to be an important predictor net of household income and education.[21] Further research comparing measures is certainly still called for beyond this exploratory study. Additional research

that uses samples including women who are not high school graduates and who are members of race and ethnic minority groups is also needed.

Although these analyses did not include the most disadvantaged women in the total American population, there was evidence that even among the relatively advantaged, differences in education and occupational status are associated with differences in health. Finding SES differences in this non-Hispanic white sample also highlights the fact that race/ethnicity is *not* an adequate proxy measure for SES in health statistics. These results lend additional support for the hypothesis that the public health issue underlying the relationship between socioeconomic status and health is that of a society-wide *gradient* in health, not simply a health difference between the most severely disadvantaged members of society and everyone else.

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TABLE 1--Descriptives for Analysis Variables

	Mean[a]	(s.d.)
Hysterectomy	0.31	
Father's education (years)	9.76	(3.40)
less than high school diploma	0.61	
high school diploma	0.25	
some college	0.06	
bachelor's degree or higher	0.07	
Mother's education (years)	10.39	(2.86)
less than high school diploma	0.52	
high school diploma	0.33	
some college	0.09	
bachelor's degree or higher	0.06	
Father's occupational status 1957 (SEI index)	348.32	(231.00)
lowest quintile	0.26	
second quintile	0.12	
third quintile	0.19	
fourth quintile	0.20	
highest quintile	0.21	
Missing father's occupation 1957	0.02	
Parents' income 1957	6312.00	(5082.00)
lowest quintile	0.18	
second quintile	0.18	
third quintile	0.19	
fourth quintile	0.19	
highest quintile	0.19	
Missing parents' income 1957	0.06	
Mental ability	102.21	(14.16)
lowest quintile	0.15	
second quintile	0.19	
third quintile	0.22	
fourth quintile	0.22	
highest quintile	0.23	
Education	13.37	(2.03)
High school diploma	0.61	
Some college	0.16	
Bachelor's degree or higher	0.22	
Occupational status 1975 (age 35)	459.70	(195.85)
lowest quintile	0.18	
second quintile	0.19	
third quintile	0.26	
fourth quintile	0.20	
highest quintile	0.14	
Never worked as of 1975	0.03	
Spouse's occupational status 1975	493.61	(229.44)
lowest quintile	0.15	
second quintile	0.18	
third quintile	0.13	
fourth quintile	0.17	
highest quintile	0.21	
Spouse's occupational status 1975 missing	0.17	

TABLE 1--Descriptives for Analysis Variables--Continued

	Mean[a]	(s.d.)
Own income 1974	2903.00	(4319.00)
Zero income	0.42	
lowest quintile	0.11	
second quintile	0.10	
third quintile	0.11	
fourth quintile	0.10	
highest quintile	0.11	
Own income 1974 missing	0.05	
Spouse income 1974	14443.00	(10583.00)
Zero income	0.10	
lowest quintile	0.10	
second quintile	0.18	
third quintile	0.09	
fourth quintile	0.21	
highest quintile	0.17	
Spouse income 1974 missing	0.16	
Not married 1975	0.16	
Married 1992-93	0.81	
Net worth 1992-93	232997.00	(456428.00)
$5,000 or less	0.09	
$5,001-$25,000	0.06	
$25,001-$50,000	0.07	
$50,001-$100,000		0.19
$100,001-$200,000	0.26	
$200,001-$400,000	0.20	
$400,001-$800,000	0.09	
greater than $800,000	0.04	
Own home 1992-93	0.90	
Own home missing	0.004	
Number of children born	2.77	(1.66)
No children	0.11	
One child	0.08	
Two children	0.25	
Three children	0.27	
Four children	0.17	
Five children or more	0.12	
Age at birth of youngest child	23.08	(3.67)
Age ≤ 19	0.15	
Age 20-21	0.26	
Age 22-23	0.21	
Age 24-29	0.23	
Age 30-54	0.05	
Three or more children before age 24	0.45	

Source: Wisconsin Longitudinal Study 1957-93.

[a] Means for categorical variables are proportions.

TABLE 2--Odds Ratios for Predictors of Hysterectomy

	MODELS				
PREDICTORS	**1 Gross R.R.**	**2 Net R.R.**	**3 Net R.R.**	**4 Net R.R.**	**5 Net R.R.**
Dad's education-less than hs diploma	1.03				.98
Dad's education-hs diploma	.96				.94
Dad's education-some college	.88				.86+
Dad's education-BS or higher[a]	1.00				1.00
-2 Log-Likelihood	4093.55				
Mom's educ-less than hs diploma	.95				.90
Mom's educ-hs diploma	.93				.91
Mom's educ-some college	.89				.89
Mom's educ-BS or higher[a]	1.00				1.00
-2 Log-Likelihood	4096.82				
Dad's occ status 57 lo quint	1.05				1.00
Dad's occ status 57 2nd quint	1.08				1.03
Dad's occ status 57 3rd quint	1.01				.98
Dad's occ status 57 4th quint	.96				.94
Dad's occ status 57 hi quint[a]	1.00				1.00
Dad's occ status 57-Missing	1.04				.93
-2 Log-Likelihood	4094.68				
Parent income 57 lo quint	1.00				.95
Parent income 57 2nd quint	.96				.91+
Parent income 57 3rd quint	1.01				.97
Parent income 57 4th quint	.90*			.85**	
Parent income 57 hi quint[a]	1.00			1.00	
Parent income 57-Missing	1.06			1.02	
-2 Log-Likelihood	4092.37				
R education-hs only	1.11**	1.10*	1.05	1.04	.97
R education-some college	1.10+	1.09	1.05	1.05	.99
R education-BS or more[a]	1.00	1.00	1.00	1.00	1.00
-2 Log-Likelihood	4093.67				
Ability (lo)	1.09	1.05	1.02	1.03	1.02
Ability 2	1.05	1.02	1.00	1.01	1.00
Ability 3	1.11*	1.09+	1.08+	1.08+	1.09+
Ability 4	1.05	1.04	1.03	1.03	1.04
Ability (hi)[a]	1.00	1.00	1.00	1.00	1.00
-2 Log-Likelihood	4094.46	4091.21			
R occ status 75 lo quint	1.24***		1.20**	1.21**	1.18*
R occ status 75 2nd quint	1.15*		1.11	1.10	1.08
R occ status 75 3rd quint	1.10+		1.06	1.07	1.07
R occ status 75 3rd quint	1.11+		1.08	1.09	1.06
R occ status 75 hi quint[a]	1.00		1.00	1.00	1.00
Never worked as of 75	1.34**		1.32**	1.34**	1.36**
-2 Log-Likelihood	4085.10		4081.79		
Spouse occ status 75 lo quint	1.08				1.03
Spouse occ status 75 2nd quint	1.13*				1.08
Spouse occ status 75 3rd quint	1.09				1.05
Spouse occ status 75 4th quint	.99				.97
Spouse occ status 75 hi quint[a]	1.00				1.00
Spouse occ status 75-Missing	1.22				1.15
Not married 75	.82				.67
-2 Log-Likelihood	4090.37				

TABLE 2--Odds Ratios for Predictors of Hysterectomy--Continued

PREDICTORS	MODELS 1 Gross R.R.	2 Net R.R.	3 Net R.R.	4 Net R.R.	5 Net R.R.
R income 74 no income	.98				.97
R income 74 lo quint	1.08				1.05
R income 74 2nd quint	1.06				1.01
R income 74 3rd quint	1.11				1.04
R income 74 4th quint	1.05+				1.00
R income 74 hi quint[a]	1.00				1.00
R income 74 missing	.99				.98
-2 Log-Likelihood	4092.44				
Spouse income 74 no income	.98				.92
Spouse income 74 lo quint	.99				.90
Spouse income 74 2nd quint	1.07				.99
Spouse income 74 3rd quint	1.08				.99
Spouse income 74 4th quint	1.06				1.01
Spouse income 74 hi quint[a]	1.00				1.00
Spouse income 74 missing	1.32				1.21
Not married 75	.75				--[b]
-2 Log-Likelihood	4093.93				
Married 93	1.02				.99
-2 Log-Likelihood	4098.62				
Net worth 93, ≤ $5,000	1.16+			1.11	1.21+
Net worth 93, $5,001-25,000	1.34**			1.28**	1.41**
Net worth 93, $25,001-50,000	1.22*			1.18+	1.26*
Net worth 93, $50,001-100,000	1.30**			1.24*	1.31**
Net worth 93, $100,001-200,000	1.21*			1.17+	1.20*
Net worth 93, $200,001-400,000	1.40***			1.37**	1.43***
Net worth 93, $400,001-800,000	1.16			1.13	1.17+
Net worth 93, > $800,000[a]	1.00			1.00	1.00
-2 Log-Likelihood	4080.58			4063.74	
Own home 93	1.05				1.07
Own home missing	1.18				1.33
-2 Log-Likelihood	4097.91				
No children	.80*				.85+
1 child[a]	1.00				1.00
2 children	.97				.98
3 children	.93				.92
4 children	.84*				.82*
5+ children	.82*				.82*
Age at 1st birth ≤ 19[a]	1.00				1.00
Age at 1st birth 20-21	1.04				1.04
Age at 1st birth 22-23	.89*				.90+
Age at 1st birth 24-29	.75***				.75***
Age at 1st birth 30-54	.68***				.70***
3 children by age 24	1.00				1.00
-2 Log-Likelihood	4054.47			3995.53	

Source: Wisconsin Longitudinal Study 1957-93.

+ p ≤ .10 * p ≤ .05 ** p ≤ .01 *** p ≤ .001 (one-tailed test)

[a] Reference groups.

[b] Odds for not married in 1975 is reported above with spouse occupational status.

Note: Gross R.R. indicates relative risk for each variable block considered separately.
Net R.R. indicates net relative risk adjusted for all other variables in the model.

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