

**SOCIOECONOMIC STATUS AND MORTALITY:
A COUPLE MODEL APPROACH**

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ABSTRACT

In the current study, we are using a sample of married couples to examine the relationships between socioeconomic status and mortality. By using married couples, we control for unmeasured heterogeneity in the family to eliminate possible selection effects from the estimated relationships between mortality and socioeconomic status. Our sample of married couples are a group of high school graduates and their spouses from Wisconsin Longitudinal Study. The variables, including individual prior health status, educational attainment, employment status, incomes and assets, were collected in 2004 and 1993 surveys; and the death status was from NDI up to 2010. We employ survival model used in Mare and Palloni (1988). We expect that net of unmeasured heterogeneity and prior health status, one's socioeconomic status will predict mortality after age 55. In the paper, we will discuss the implications of our findings, limitations of our analysis and data, and possible future research.

INTRODUCTION

Socioeconomic status is consistently associated with health, health-related behaviors, chronic diseases, and mortality in later adulthood. Women and men of higher socioeconomic status, comparing to those of lower socioeconomic status, tend to be healthier and less likely to die over life course. Recent research has gone beyond establishing the relationship but focused on the following two directions. Some studies attempted to explain how socioeconomic status may influence health while other studies attempted to disentangle the causality of socioeconomic status and health and/or mortality. The current study examined the association between mortality and socioeconomic status using longitudinal data of married couples and their prior health status to partially control for unmeasured heterogeneity and possible selection effects.

The major criticism toward studies of socioeconomic disparity in health and mortality in later adulthood is the plausible selection effect. The relationship between health/mortality on one hand and individual socioeconomic status on the other has been observed throughout life course, but their causal directions are not straightforward. For example, childhood health and health at birth are associated with parental socioeconomic status while they are associated with intellectual development and education of the child in young adulthood. Additionally literature suggested that the association, though observed throughout life course, was the strongest around age 50's; afterwards the magnitude of the association decreased (Beckett 1989). The selection effect does not suggest that the causal direction should be reversed from socioeconomic status-health to health-socioeconomic

status, but the magnitude of the reported effects might be underestimated or overestimated and the estimated relationship might be biased.

Lacking of controlling for unmeasured heterogeneity might affect the estimated associations between socioeconomic status and health in two ways. First, the individual socioeconomic status did not take the “full” socioeconomic status into account. The significant effects of socioeconomic status on mortality might be an artifact of unmeasured characteristics. And controlling for an array of variables was not the solution. For example, though many studies of health/mortality and socioeconomic status either focused on or controlled for spousal health/mortality and socioeconomic characteristics, the shared but unmeasured characteristics of the spouses (and the respondents) were rarely included in the models. Mare and Palloni (1988), Shinberg (2001) and Stolzenberg (2001) were the exception, along with a handful of studies in examining the resemblance in diseases and risky behaviors between married couples (for example, Clark and Etile 2006).

Socioeconomic status, including jobs, occupational status, income and wealth, was associated with many dimensions of daily life such as marriage and fertility. Therefore, the effects of spousal socioeconomic status on health and mortality, net of the influences of one’s own socioeconomic status, might simply be entirely or partially an artifact of unmeasured heterogeneity. Additionally, assortative mating of socioeconomic status might be considered as a form of selection. Men and women tended to marry to partners of similar socioeconomic status/background, similar life styles and health status (Fu and Goldman 1996, Kalmijin 1998). Spousal characteristics were not completely randomly

distributed and were a result of self-selection. Consequently, the inter-spousal influences might capture unmeasured characteristics or the degree of dissimilarity between husband and wife. The omission of unmeasured heterogeneity might misestimate the extent of influences of one's own and spousal socioeconomic status (Mare and Palloni 1989; Stolzenberg 2001).

RESEARCH QUESTIONS

The ultimate goal for this study was to estimate the influences of socioeconomic status on mortality while taking into account of unmeasured heterogeneity in the “current” family, inter-influences of spousal socioeconomic characteristics and prior health status of husbands and wives. Mainly we wanted to know whether the estimation of mortality at later adulthood would be improved by controlling for unmeasured heterogeneity of the current family environment shared by the husband and wife, to what extent controlling for prior health status would improve the models or change findings from models without such controls, and what socioeconomic characteristics remained significant.

In our analysis, we first allowed measured individual socioeconomic characteristics of husbands and wives influenced one another and shared characteristics or economic resources such as wealth and income influenced both husband's and wife's health. A model of no inter-spousal influences was estimated next. We further imposed a zero constraint on the coefficient of each inter-spousal independent variable on at a time. Later, we estimated a model in which only significant inter-spousal predictors were included.

Finally, prior health status of husband and of wife were entered into the equations. The model selection process was repeated.

We expect socioeconomic status of both spouses were positively associated with individual mortality. The unmeasured shared environment would explain variation in mortality significantly. Some spousal characteristics influence the mortality. Prior health status might partially explain the associations between one's own and spousal socioeconomic status and the mortality.

In the next section, we introduced the data and variables used in the study.

METHODS

Data

[Table 1 Here]

Mortality of the original respondents from the Wisconsin Longitudinal Study (WLS) and their spouses were studied. The WLS is one of the longest life course and aging studies in the nation. The original study was a census of all Wisconsin high school seniors in 1957 on their educational expectation, performance, aspirations, and family background. Later, about 1/3 of original respondents were further interviewed in 1975, 1993, and 2004. Hereafter they were noted as graduate respondents because almost all of them graduated from the high school. Parents were also contacted in 1964 to report the socioeconomic and family status of the graduates. In 1977, 1995 and 2005, a randomly selected sibling was scheduled to be interviewed for all non-singleton original graduate respondents. In 2005,

most recent spouses and widowers of the graduate and sibling respondents in 2004 were interviewed.

Several characteristics of the WLS strengthened our analysis. The study has collected information on socioeconomic status from the graduate respondents (and their siblings) since age 18 in 1957. The socioeconomic characteristics of current spouses of the graduates and siblings were also collected in each interview. They included education, employment status, occupational status, and income. The details in socioeconomic history of the respondents and their families ensured the quality of the key measured explanatory variables, i.e., socioeconomic status. The stability of marital life simplified our analysis at the current stage. Of all ever married graduate respondents at age 65, in 2004, 80% only married once, 66% still married to the original spouses, and 6% lost the first spouses and never remarried. The statistics were comparable to the national figures for whites. Over 50 years, the WLS still maintained at least 85% of response rate for the graduate interviews. Almost all respondents were white men and women born in late 1930s and some in early 1940s. Their socioeconomic profiles were close to the national average at that time. Though lack of racial and ethnic diversities might be an issue, the current study did not intend to explore the areas of health diversity in race. The issue of racial/ethnic diversity could and would be addressed in another study using more appropriate data.

Mortality of the respondents and siblings were rigorously followed after 1993, and deaths occurred earlier were collected through National Death Index. The deaths of formerly divorced spouses could not be found because the WLS did not collect personal

information on intermediate spouses and did not trace back to the living status of the spouses in the prior interviews if the marriage was not dissolved by spousal death.

However, given the stability in marriage of this generation the impact of omission would be trivial. Note that we rearranged the respondents and their spouses by gender. That is, in our analysis, one dependent variable was for the husbands and the other was for the wives.

Variables

Table 1 showed the descriptive statistics of all variables employed in the models by husbands and wives. The dependent variables were the mortality status up from 1993 to 2010, reported by the respondents for the spouses and found through search in NDI for the respondents. The spousal mortality status was reported by the graduates. We obtained about 3000 pairs of husbands and wives.

Health status of the graduates and the spouses were first collected in 1993 (graduates) and ever since. It was the general health status and originally coded from very poor (1), poor (2), fair (3), good (4) and excellent (5). The variables of socioeconomic status were collected in 1993. There were two types of socioeconomic status included in the analysis: variables *presumably unique* to the husband and to the wife, and variables shared in the family. The shared (between-family) explanatory variables included family assets measured (in \$1,000K) and family income (in \$1k). The family income was calculated by sum of the respondent's and spouse's incomes, including incomes from regular sources such as wages, salary, tips, pensions, social security, public programs, and other sources, and incomes from dividends, inheritances, and lottery. The assets included net worth of

real estates, vehicles, retirement savings, bank accounts, investments, other financial assets, life insurances and outstanding loans or debts. The unique (within-family) independent variables included age, years of schooling, occupational education score, occupational income score, and employment status for both husbands and wives. Occupational scores were based on started logit transformation of the raw percentage of persons in 1990 Census occupation/industry/class-of-worker category who completed one year of college or more (Occupational Education) and of the raw percentage of persons in 1990 Census occupation/industry/class-of-worker category who earned \$14.30 per hour or more in 1989 (Hauser and Warren 1997). Employment status is the only dichotomous variable. They were all collected in 1993 around age 55. We also control for age and age at marriage.

ANALYTICAL PLAN

We will conduct analysis of within and between couple's survival time. Then, we will use bivariate tobit model, bivariate hazard models and pair rank models for survival to study the effects of socioeconomic status on mortality.

We expect the socioeconomic status, after controlling for unmeasured heterogeneity, has significant impact on health of husbands and wives.

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