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Socioeconomic Status and Health: Focusing on Co-Morbidity of Self Rated Health and Psychological Well-Being

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Focusing on Co-Morbidity of Self Rated Health and Psychological Well-Being

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ABSTRACT

Despite the well-documented associations between social and economic positions and diverse health conditions, the necessity and urgency of exploring the social and economic consequences of an array of health dimensions together have been proposed as a critical area of research to fully appreciate socioeconomic-health inequalities. The overall objective of the present study is to estimate the variance and covariation of two dimensions of health, i.e., self-rated health and psychological well-being, simultaneously, with specific attention to the social and economic influences, utilizing the multivariate response model. We use the 2005 National Health Interview Survey. Primary results indicate that variance in both self-rated health and psychological distress becomes attenuated with the adjustment of social and economic status, although variation in each outcome remains unexplained to some substantial degree. In addition, there is a strong and positive relationship between these two health outcomes in that individuals who are unhealthy tend also to have poor psychological resources (correlation = .34) and the substantial portion of co-morbidity between health conditions is attributable to the social and economic factors (about 37%).

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INTRODUCTION

Social research on health has well documented the associations between social and economic positions and diverse health conditions. To fully appreciate the social and economic impacts on health overall, however, the necessity and urgency of exploring the consequences of social and economic arrangements across a wide range of health dimensions have been proposed as a critical area of social research. In the recent review, Aneshensel noted that "the single-disorder approach is inappropriate for social consequences model because the effects of structural conditions tend to be nonspecific, not limited to one particular disorder." (2005: 225; emphasis added; also see Link and Phelan's fundamental social cause argument.) In other word, research investigating the health outcome one at a time does not completely capture the overall health consequences of social and economic forces by implicitly classifying unhealthy people in other dimensions of health as "well" who are more likely to be in the socially and economically disadvantaged positions. Consequently, the impacts of social and economic forces on health tend to be underestimated and undercounted in this kind of research despite unintentional. To comprehensively address socioeconomic-health inequalities, she encouraged analyzing multiple outcomes simultaneously, using "techniques such as multivariate analysis of variance or multinomial logistic regression to handle these outcomes." However, there is not much research on investigating the co-morbidity across multiple dimensions of health at the same time. Moreover, no research has undergone the comparison of the distinct and joint contribution of social and economic status to each health outcome and to between them.

In response to this call, the overall objective of the present study is to estimate the variance and covariation of two important dimensions of health status, i.e., self-rated health and psychological well-being, with specific attention to the impact of social and economic status. Both self-rated health and psychological well-being are considered end points by themselves which are fundamental to the quality of life. There is substantial evidence on the uneven distribution of each outcome of interest across social and economic groups. However, those studies have investigated each outcome independently. No research has been done to empirically demonstrate the nature and magnitude of the co-patterning of self-rated health and psychological well-being and also quantify to the extent which social and economic conditions account for each health outcome and the co-morbidity of between-them. We apply the extension form of the multilevel model, i.e., the multivariate response model, to analyze self-rated health and psychological well-being simultaneously, using the 2005 National Health Interview Survey which is the most recent and nationwide-representative data.

SPECIFIC AIMS

1. To estimate a joint covariance to assess to the extent which the self-rated health and psychological well-being covary within individuals, in addition to a distinct variance to investigate the degree to which each health outcome varies across individuals.
2. To examine to the extent which social and economic markers take into account the joint covariance of the self-rated health and psychological well-being within individuals simultaneously and the variation across individuals for each outcome independently.

3. In addition, to identify the co-determinants of the self-rated health and psychological well-being, as well as differences in the nature and strength of determinants between these two outcomes.

SELF-RATED HEALTH and PSYCHOLOGICAL WELL-BEING

Given the WHO definition that "health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity," we chose the self-rated health and psychological well-being as an outcome of interest in this study. That is, self-rated health is one of the most pervasive measures of physical health status despite subjective one, given its exceptional predictive validity of objective dimensions of health such as disease, mortality, and health services utilization. The literature on psychological well-being is also expanding as it is closely tied to most aspects of human welfare, becomes the important contributor to the global burden of disease and mortality, and prevalence rates have been increasing and are projected to rise in coming years.

DATA AND METHODS

Data and Sample Selection

We use data from the 2005 National Health and Interview Surveys (NHIS). The NHIS is specifically designed for broad information about health and illness in the US and has been annually conducted by National Center for Health Statistics and the Centers for Disease Control and Prevention since 1957. The 2005 NHIS is the most recent data available for public use. The NHIS is widely used among health researcher due to the richness of data and a large nationally representative sample. The NHIS consists of main module and supplements which cover general health related information as well as specific and detailed information. Among various sub data sets of the 2005 NHIS, we

collect information from four data sets which include main person, family, sample adult core, and income supplement file and merge them for analysis. We limit our analysis to civilian non-institutionalized population who are aged 23 or older to estimate more accurate association between education and health outcome, because respondents who are under 23 are not likely to have enough time to complete their education.

Measurements

We use two dependent variables to explore the causal effect of socioeconomic status on health outcome. One variable is from self-rated health question and the other variable is constructed from psychological well-being measure. For self-rated health, respondents were asked 'would you say your health in general is excellent, very good, fair or poor?' and the values are ranged 1 to 4. Lower value indicates that people are in a better health condition. On the other hand, psychological distress is constructed with the following four depression items based on respondents' experience in the past 30days: 'how often did you feel so sad that nothing could cheer you up?'; 'how often did you feel hopeless?'; 'how often did you feel that everything was an effort?'; 'how often did you feel worthless?' Respondents answered one of 'all of the time', 'most of the time', 'some of the time', 'a little of the time', 'none of the time' which was coded from 1 to 5 respectively. To construct the depression variable, we average the values for each item after recoding reversely to indicate that higher value of the variable implies higher level of depression. The alpha coefficient for these four items is .82.

We include a wide range of social and economic information such as age, gender, race/ethnicity, marital status, educational attainment, labor force participation status, and homeownership variable. We also include a variable based on the question whether any

family members have delayed medical care in the last 12 month to control for health insurance status and financial hardship.

We classify age variable into five categories with a 15 year interval except for the first category that has 7 years due to sample selection mentioned above in this paper. The 15 year interval is based on a consideration of different life transitional stages. For example, on average, most people finish their education early twenties and start their own family around thirties. People are more likely to enter next stage which entails children's leaving for college or union formation, and declining sense of control (Mirwosky and Ross. 2003) after mid forties. Retirement from work and functional limitation usually come next around sixties.

Most other variables are coded as dichotomous. For example, educational attainment is coded as four dummy variables after classifying years of schooling into four categories such as 'less than high school', 'high school', 'some college' and '4 year college or higher'. If respondents are currently in labor market, they are coded 0 (others 1). Those who own their house are coded 0 and, if not, 1 coded. Respondents who have delayed medical care are coded 1 (others 1).

Analytic Strategy

We utilized the multivariate (or multiple) response model to answer research questions listed above. This model is one of the extensions of the multilevel model in a way to treat the individual as a level 2 unit and the multiple measurements observed within an individual as a level 1 unit. By dealing with multiple outcomes within the multilevel framework, it allows us to estimate the covariance (and correlation) between two outcomes nested in individuals, as well as the variance for each outcome in a

simultaneous manner. It has been noted that the real advantage of the multivariate response model lies in the capability to model the covariance (or correlation) between responses. We calibrated a 2-level model of 52592 (two for each individual) at level 1 nested within 26296 individuals at level 2.

The equation is given by

$$Y_{ij} = B_{01}Z_{1ij} + B_{02}Z_{2ij} + B_{11}Z_{1ij}X_j + B_{12}Z_{2ij}X_j + U_{1j} + U_{2j}$$

Where $Z_{1ij} = 1$ if self-rated health status and 0 if psychological well being,

$Z_{2ij} = 1 - Z_{1ij}$,

X_j = explanatory variables,

And $\text{var}(U_{1j}) = \sigma^2 u_1$, $\text{var}(U_{2j}) = \sigma^2 u_2$, $\text{cov}(U_{1j}\ U_{2j}) = \sigma u_{12}$

To estimate the variance and covariance change which is attributable to the social and economic influences, we adopt the below equation,

PCV = (Vn – Vn+1) / Vn ---- the proportional change in variance

PCCV = (CVn – CVn+1) / CVn ---- the proportional change in covariance

Where Vn and CVn are the individual variance and covariance in the empty model, respectively and Vn+1 and CVn+1 are the individual variance and covariance in the model including social and economic characteristics.

RESULTS

Descriptive Result

Table 1 presents the sample characteristics with the variables that were used in the analysis. The statistics were weighted for multistage sampling processes of NHIS to produce unbiased estimates for the entire population. The descriptive statistics show that 13.92% of respondents are aged between 23 and 29, 31.7% of them is in their 30's or

younger than 45, about 30% is for the category between 45 and 60, and 16.14% and 8.33% are for age 60 to 74 and 75 or older, respectively. In terms of gender composition, female respondents are at higher proportion (52.22%) than male respondents (47.78%).

The descriptive statistics also show that most respondents are non-Hispanic white (75.82%), while 11.49% is for non-Hispanic blacks and 12.69% is for Hispanic. With respect to marital status, about 62% of respondents are currently married and 5.69% is having a marriage like relationship with their partner. Almost 12% is single after divorce or separation with their spouse. 6.95% is widowed. The rest of them (13.43%) is never married.

- Table 1 about here -

Educational attainment variables are rather evenly distributed for three categories, such as 'high school', 'some college' and '4 year college or higher', especially among those who completed at least 12 years of schooling (84.23% of respondents), but 15.77% of them did not complete high school level of education. Almost 70% of respondents are currently at the labor market and 74.03% report that they own a house. 14.61% of respondents report that they have delayed medical care for any family member during the last 12 months at the time of the interview due to the lack of health insurance or financial constraints.

Variance and Covariance

Table 2 shows the variance and covariance in, and between, the self-rated health and psychological well-being and their magnitudinal change between the empty model (without any predictor) and the adjusted model (with all social and economic status measures).

- Table 2 about here -

First, the bivariate result indicates that there is significant individual variation in each outcome of interest, but variation is much larger in self-rated health than in psychological well-being. As expected, second, variance in both self-rated health and psychological distress becomes attenuated with the adjustment of social and economic markers, although variation in each outcome, especially psychological well-being, remains unexplained to some substantial degree. The social and economic makers account for about 24% and 12% of variation of self-rated health and psychological well-being, respectively.

Third, there is a strong and positive relationship between these two health outcomes in that individuals who are unhealthy tend also to have poor psychological resources and vice verse. The correlation coefficient of about .34 (in the bivariate model) indicates that physical and psychological health tends to covary to some great degree. Although it is also true that social and economic factors do not fully take into account this covariance (correlation coefficient is about .26 in the adjusted model as compared to .34 in the empty model), about 37 percent of the co-morbidity between these two health conditions are attributable to the social and economic influences.

The Co-Determinants of Self-Rated Health and Psychological Well-Being

Table 3 presents the multivariate result of the multivariate response model. Consistent with our expectation, people in the socially and economically advantaged position tend to be healthy not only physically but psychologically, although there are some exceptions, especially in case of psychological well-being.

- Table 3 about here -

All older age groups as compared with the young adult (23-29 years old) tend to have poorer self-rated health. However, it is not in the progressive manner. That is, notable differentials in the self-rated health are found in the age groups older than 45 as compared with the young adult. Among those older age groups, there is not much difference in self-rated health. The relation between age and psychological well-being is rather striking in that the psychological distress is lower among the age group of 60 and beyond as compared with the young adult group. Women report better physical health status than men, while women are at greater risk of being psychological distressed.

In comparison with non-Hispanic whites, non-Hispanic blacks show much higher risk of having poor self-rated health, while there is no difference for Hispanics. Unexpectedly, both minority populations report their psychological health more positively. However, the bivarate relationship (not shown here) indicates that non-Hispanic blacks and Hispanics are more likely to be at greater risk of having high level of psychological distress. Unexpectedly, married people are not healthier than others who have different living arrangements, except the cohabited, although the coefficient is only statistically significant in case of the divorced. In terms of psychological well-being, people in all other types of living arrangements, especially the widowed, as compared with the married, have much higher level of psychological distress.

Association between educational achievement and self-rated health and psychological well-being shows the clear gradient, with the educational gradient being much stronger and clearer for the poor health as compared with being psychologically stressed. Consistent with the previous study, the better-educated people are likely to report better self-rated health condition and lower level of psychological burden. Family

income and two outcomes of interest also have a strong and linear relationship such that people with higher family income are likely to report their health more positively not only physically but also psychologically. As expected, the employed tend to be healthier and have lower level of psychological burden. While home owners report better physical health condition, however, they are at greater risk of being psychologically distressed. People that experienced any delay of medical treatments among their family members during the last 12 months have significantly higher risk of being unhealthy both in term of physical and psychological well-being.

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Table 1. Descriptive Statistics

Variable	Mean	Std.Dev
Depression	1.3020	50.4671
Self-rated health status	2.2802	88.2023
Total household income	7.6490	244.8560
	Proportion	
Age		
23-29	13.92	
30-44	31.7	
45-59	29.9	
60-74	16.14	
75+	8.33	
Gender		
Male	47.78	
Female	52.22	
Race/Ethnicity		
Non-Hispanic White	75.82	
Non-Hispanic Black	11.49	
Hispanic	12.69	
Marital Status		
Married	61.96	
Cohabiting	5.69	
Divorced/Seperated	11.96	
Widowed	6.95	
Never married	13.43	
Educational Attainment		
Less than high school	15.77	
High school	29.46	
Some college	27.47	
College and higher	27.40	
Employment Status		
Employed	69.63	
Unemployed	30.37	
Home ownership		
Owned	74.03	
Rented or other arrangement	25.97	
Delayed medical care		
Yes	14.61	
No	85.39	

Note: The statistics are weighted.

Table 2. Covariance and Variance in Self-Rated Health and Psychological Well-Being

	Bivariate Model	Multivariate Model
Individual Covariance	0.2448	0.1543
(Correlation)	0.3435	0.2637
Self-Rated Health	1.1981	0.9132
Psychological Well-Being	0.4240	0.3749
Proportional Change in Covariance		0.3696
Proportional Change in Variance for the Self-Rated Health		0.2378
Proportional Change in Variance for Psychological Well-Being		0.1158

Table 3. Estimates of Variables for Two Health Outcomes

	SRH			Psychological Well-Being		
Parameter	Estimate		Std. Error	Estimate		Std. Error
Age (age 23-29)						
Age 30-44	0.2801	***	0.0200	0.0899	***	0.0128
Age 45-59	0.6011	***	0.0210	0.1240	***	0.0135
Age 60-74	0.6191	***	0.0247	-0.0502	***	0.0158
Age 75 and older	0.6222	***	0.0310	-0.1132	***	0.0199
Gender (Male)						
Female	-0.0299	**	0.0120	0.0578	***	0.0077
Race/Ethnicity (Non-Hispanic White)						
Non-Hispanic Black	0.1400	***	0.0176	-0.0385	***	0.0113
Hispanic	0.0030		0.0173	-0.0638	***	0.0111
Marital Status (Married)						
Never married	-0.0020		0.0186	0.0588	***	0.0119
Cohabiting	0.0847	***	0.0286	0.0461	**	0.0183
Divorced	-0.0609	**	0.0238	0.0393	**	0.0153
Widowed	-0.0097		0.0174	0.0933	***	0.0111
Education (College or Higher)						
Less than high school	0.5225	***	0.0208	0.1459	***	0.0133
High school	0.3197	***	0.0167	0.0545	***	0.0107
Some college	0.2403	***	0.0164	0.0500	***	0.0105
Total household income	-0.0555	***	0.0026	-0.0249	***	0.0017
Employment Status (Employed)						
Unemployed	0.4391	***	0.0158	0.2148	***	0.0101
Home Owner (Owned)						
Rented or Other	0.0800	***	0.0146	-0.0526	***	0.0093
Delayed Medical Care (No)						
Yes	0.4304	***	0.0169	0.3305	***	0.0108
Intercept	1.4582	***	0.0396	1.0555		0.0254

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

Note: the values in parenthesis are reference categories.