Spousal Education and Morbidity in the United States

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Background

- Education shares an inverse association with most chronic and acute health problems.

- Social scientists typically conceptualize education as an individual-level resource.

- A growing body of research – primarily from Europe – suggests that education is a pooled, or household resource, within a marriage.

- Evidence linking spousal education to specific causes of morbidity is relatively sparse, particularly in the United States.

- The purpose of this study is to examine the association between spousal education and morbidity in the United States.

Theoretical Perspectives

Two broad theoretical perspectives linking spousal education and health and/or mortality emerge from prior studies:

- <u>Household Resource</u>: Material and non-material resources at the individual-level are pooled within a marriage to become resources at the *household* or *family-level*

- <u>Status Inconsistency</u>: Status discrepancies between spouses that are inconsistent with broader social norms initiate the following general process:

    Role Conflict → Stress → Poor Health → Death

Previous Research

- Research drawing on data from European and Israeli populations generally supports the <u>household resource</u> perspective.

  - <u>Outcomes</u>: Self-rated health, all-cause mortality, CVD morbidity/mortality, alcohol consumption, smoking, and obesity

- The <u>status inconsistency</u> perspective is supported in some older studies from the United States

  - <u>Outcomes</u>: Psychological distress, CVD morbidity and mortality

- A few recent studies in the United States find little support for a link between spousal education and one's own health

  - <u>Outcomes</u>: Self-rated health, all-cause mortality

Research Questions

- Is a spouse's education linked to his/her partner's health net of his/her own education?

- How are discrepant levels of education between spouses associated with each partner's health?

- Are there gender differences in the association between spousal education and health?

- To what extent do the associations outlined above vary across different health outcomes?

Data

- National Health Interview Survey Adult Sample File (NHIS)

    - NHIS is a nationally representative cross-sectional survey of the U.S. non-institutionalized civilian population ages 18+

    - NHIS Sample Adult Files (1997 – 2009)

    - Response Rates: Household ≈ 90%; Sample Adult Files ≈ 80%

- Restrictions:

    - Ages 35 and over

    - Married at the time of interview

    - Non-Hispanic white, Non-Hispanic black, and Hispanic

    - Not missing on the outcome variables or covariates

Outcomes

- Hypertension (e.g., "Have you ever been told by a doctor or other health professional that you have high blood pressure"?)

- Diabetes (e.g., "Have you ever been told by a doctor or other health professional that you have diabetes or sugar diabetes"?)

- Body-Mass Index -- Grouped into 3 Categories: "healthy weight" (BMI: 18.5-24.9), "overweight" (BMI: 25.0-29.9), and "obese" (BMI: 30.0+)

Predictors

- Own and Spouse's Education

    - Years of completed formal schooling

    - < High School, High School, Some College, College Degree

- Age at Interview: 35 to 49, 50 to 64, 65 to 79, and 80+

- Race-Ethnicity: Non-Hispanic White, Non-Hispanic Black, Hispanic

- Nativity: U.S.-Born vs. Not U.S.-Born

- Gender

Methods

- Nested Logistic Regression Models Estimated Separately for Women & Men

- Model 1: Y = Own Education + Age + Race + Nativity

- Model 2: Y = Own Education + Spouse's Education + Age + Race +
  Nativity

- Model 3: Y = Own Education + Spouse's Education + Own
  Education*Spouse's Education + Age + Race
  + Nativity

- Additional models (Models 4 – 6) were estimated that included a control for the ratio of household income to the poverty threshold (Results Not Shown).

- Z-tests to evaluate gender differences in the effect of own and spouse's education.

Table 1: Odds of Diagnosed Hypertension

	Women (N = 43,373)			Men (N = 42,166)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	2.276***	1.650***	1.894***	1.392***	1.233***	1.011
HS	1.669***	1.386***	1.516***	1.277***	1.162***	1.277**
SCOL	1.371***	1.223***	1.213***	1.283***	1.205***	1.236***
Spouse's Ed						
LTHS		1.682***	1.466+		1.248***	1.267
HS		1.331***	1.368***		1.208***	1.303***
SCOL		1.238***	1.334***		1.126***	1.125*
Own X Spouse's Ed						
LTHS X LTHS			0.988			1.175
LTHS X HS			0.957			1.168
LTHS X SCOL			0.722			1.388
HS X LTHS			1.102			1.087
HS X HS			0.889			0.825+
HS X SCOL			0.828+			0.892
SCOL X LTHS			1.216			0.810
SCOL X HS			0.976			0.932
SCOL X SCOL			0.967			0.990
Log-Likelihood	-22,985	-22,926	-22,922	-25,138	-25,119	-25,108
BIC	46,077	45,991	46,078	50,382	50,377	50,451

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$

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Table 2: Odds of Diagnosed Diabetes Mellitus

	Women (N = 43,373)			Men (N = 42,166)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	3.906***	2.342***	3.138***	2.016***	1.699***	1.507+
HS	2.411***	1.757***	2.442***	1.585***	1.383***	1.439**
SCOL	2.006***	1.646***	1.514**	1.649***	1.485***	1.593***
Spouse's Ed						
LTHS		2.276***	3.213***		1.405***	1.447
HS		1.650***	1.834***		1.337***	1.464***
SCOL		1.462***	1.645***		1.285***	1.285*
Own X Spouse's Ed						
LTHS X LTHS			0.530			1.074
LTHS X HS			0.722			1.045
LTHS X SCOL			0.943			1.353
HS X LTHS			0.551*			1.054
HS X HS			0.667+			0.830
HS X SCOL			0.612*			1.102
SCOL X LTHS			0.951			0.928
SCOL X HS			1.077			0.955
SCOL X SCOL			1.014			0.859
Log-Likelihood	-10,290	-10,221	-10,214	-12,846	-12,832	-12,826
BIC	20,687	20,581	20,663	25,799	25,802	25,886

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$

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Table 3: Odds of Healthy Weight (BMI = 18.5 – 24.9) vs. Overweight (BMI – 25.0 – 29.9)

	Women (N = 42,801)			Men (N = 42,104)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	1.906***	1.386***	1.738**	1.007	1.013	0.814
HS	1.563***	1.268***	1.402***	1.173***	1.127**	1.352***
SCOL	1.432***	1.259***	1.288***	1.215***	1.171***	1.277***
Spouse's Ed						
LTHS		1.654***	1.520*		0.967	1.039
HS		1.422***	1.524***		1.108*	1.318***
SCOL		1.289***	1.413***		1.106**	1.123*
Own X Spouse's Ed						
LTHS X LTHS			0.866			1.268
LTHS X HS			0.714			1.024
LTHS X SCOL			0.855			1.196
HS X LTHS			1.018			0.730
HS X HS			0.851			0.709**
HS X SCOL			0.816+			0.842
SCOL X LTHS			1.155			0.740
SCOL X HS			0.956			0.763*
SCOL X SCOL			0.886			0.945
Log-Likelihood	-44,646	-44,386	-44,367	-43,377	-43,354	-43,335
BIC	89,504	89,049	89,204	86,966	86,985	87,138

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$

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Table 4: Odds of Healthy Weight (BMI = 18.5 – 24.9) vs. Obese (BMI = 30.0+)

	Women (N = 42,801)			Men (N = 42,104)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	3.349***	1.852***	2.333***	1.759***	1.613***	1.228
HS	2.286***	1.546***	2.038***	1.715***	1.533***	1.904***
SCOL	2.004***	1.554***	1.624***	1.675***	1.528***	1.764***
Spouse's Ed						
LTHS		2.617***	2.911***		1.149*	1.983**
HS		1.931***	2.260***		1.281***	1.633***
SCOL		1.707***	2.003***		1.256***	1.263**
Own X Spouse's Ed						
LTHS X LTHS			0.711			0.801
LTHS X HS			0.719			1.065
LTHS X SCOL			0.913			1.461
HS X LTHS			0.788			0.484**
HS X HS			0.660***			0.627***
HS X SCOL			0.621***			0.874
SCOL X LTHS			0.901			0.425**
SCOL X HS			0.899			0.706**
SCOL X SCOL			0.851			0.888
Log-Likelihood	-44,646	-44,386	-44,367	-43,377	-43,354	-43,335
BIC	89,504	89,049	89,204	86,966	86,985	87,138

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

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Summary

- A spouse's education is linked to his/her partner's health net of his/her partner's own education.

- The effect of a person's own education is attenuated after introducing controls for spousal education, particularly for women.

- The additive association between own and spousal education suggests that education is a household resource.

- Evidence for the status inconsistency perspective is limited in these analyses.

Summary (continued)

- The results suggest that lower levels of own and spousal education are particularly detrimental to women. This is may be a consequence of mortality selection.

- These general patterns exist when younger adults (e.g., those ages 35 to 49) are not included (Analyses Not Shown).

- These general patterns remain after controlling for poverty status (Analyses Not Shown).

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Limitations & Next Steps

- There are important unmeasured factors that lead people to get or remain married to persons with more or less education than themselves.

- The analyses presented do not address the mechanisms through which own and spousal education influence various health outcomes.

- Mortality selection is not accounted for in the analyses.

- Additional work needs to be done to see if the results extend to other conditions and/or diseases.

Conclusion

- Models omitting information on spousal education among the married may overestimate the importance of an individual's own education on his/her health.

- Researchers should seriously contemplate including spousal education in analyses of educational differences in morbidity among the married.

- Future research should carefully examine the mechanisms linking spousal education and morbidity.

Supplementary Materials

Descriptive Statistics

Table 1A: Descriptive statistics for the sample, NHIS Adult Sample (1997 – 2009)

	Women		Men	
	N	%	N	%
Hypertension	12,525	28.6	14,450	34.0
Diabetes	3,176	7.1	4,289	9.7
Body Mass Index (BMI)				
Healthy Weight (18.5 – 24.9)	18,390	43.2	10,093	23.4
Overweight (25.0 – 29.9)	13,816	31.3	20,634	48.6
Obese (≥ 30.0)	10,595	24.2	11,377	27.8
Mean BMI		26.6		27.9
Psychological Distress (K6)				
Serious Mental Illness (13 – 24)	1,189	2.7	756	1.7
Mean K6 Score (Range: 0 to 24)	43,375	2.3	42,174	1.8

Descriptive Statistics

Table 1A: Descriptive statistics for the sample, NHIS Adult Sample (1997 – 2009)

	Women		Men	
	N	%	N	%
Own Education				
Less than high school	6,163	11.8	7,019	14.2
High school	13,404	31.2	11,496	27.4
Some college	12,290	29.0	10,841	26.1
College	11,518	28.0	12,818	32.3
Spouse's Education				
Less than high school	7,329	14.5	5,999	11.9
High school	12,135	28.2	13,424	31.8
Some college	10,713	25.1	11,746	28.5
College	13,198	32.1	11,005	27.8
Income to Poverty				
Poor (0.00 to 0.99)	2,239	4.2	2,045	4.0
Near Poor (1.00 to 1.99)	5,660	11.7	5,415	11.4
Not Poor (2.00 and over)	35,476	84.1	34,714	84.7

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Descriptive Statistics

Table 1A (Continued): Distribution of Own X Spouse's Education in the Analytic Sample

	Women		Men	
	N	%	N	%
< High School X < High School	4,059	7.4	3,885	7.3
< High School X High School	1,268	2.7	1,985	4.4
< High School X Some College	643	1.3	918	2.0
< High School X College	193	0.4	231	0.5
High School X < High School	2,109	4.6	1,236	2.6
High School X High School	6,623	15.5	6,438	15.4
High School X Some College	2,978	7.0	2,633	6.5
High School X College	1,694	4.1	1,189	2.9
Some College X < High School	943	2.1	643	1.4
Some College X High School	2,986	7.1	3,199	7.7
Some College X Some College	5,039	11.8	4,948	11.9
Some College X College	3,322	8.0	2,051	5.0
College X < High School	218	0.5	235	0.5
College X High School	1,258	3.0	1,802	4.3
College X Some College	2,053	5.0	3,247	8.1
College X College	7,989	19.6	7,534	19.4

Descriptive Statistics

Table 1A (Continued): Descriptive Statistics for the Analytic Sample

	Women		Men	
	N	%	N	%
Age				
35 to 49	21,348	48.7	16,791	41.8
50 to 64	14,495	34.5	15,192	36.7
65 to 79	6,528	14.4	8,482	17.9
80 and over	1,004	2.4	1,709	3.6
Mean	43,375	52.0	42,174	54.3
Race-Ethnicity				
Non-Hispanic White	34,102	84.9	33,061	83.7
Non-Hispanic Black	3,337	6.5	3,642	7.4
Hispanic (Any Race)	5,936	8.6	5,471	8.9
Immigrant	5,620	9.9	5,291	10.1

Outcomes

- Cardiovascular Health: Coronary heart disease, angina pectoris, myocardial infarction, stroke, hypertension, and/or other heart conditions or diseases

- Metabolic Health: Diabetes Mellitus, Body-Mass Index (3 Categories: "healthy weight" (BMI: 18.5-24.9), "overweight" (BMI: 25.0-29.9), and "obese" (BMI: 30.0+)

- Functional Limitations: Limited in any way in social activities, pushing/pulling large objects, stooping, walking, climbing stairs, sitting/standing, reaching, grasping, and/or carrying objects

- Psychological Distress (K6) : Six items measuring non-specific psychological distress. Each item ranges from 0 to 4. Dichotomized 0 – 12 vs. 13 – 24 to indicate "serious mental illness" (Kessler, et al. 2010).

Functional Limitations

- **"Limited in any way"** on one or more of the following:

- "**By yourself, and without any special equipment, how difficult is it for you to…..**"

  - "**. . . push or pull large objects like a living room chair?**"

  - "**. . . go out to things like shopping, movies, or sporting events?**"

  - "**. . . participate in social activities such as visiting friends, attending clubs and meetings, and going to parties?**"

  - "**. . . do things to relax at home or for leisure (reading, watching TV, sewing, listening to music)?**"

  - "**. . . walk a quarter of a mile--about 3 city blocks?**"

  - "**. . . walk up 10 steps without resting?**"

  - "**. . . stand or be on your feet for about 2 hours?**"

  - "**. . . sit for about 2 hours?**"

  - "**. . . stoop, bend, or kneel?**"

  - "**. . . reach up over your head?**"

  - "**. . . use your fingers to grasp or handle small objects?**"

  - "**. . . lift or carry something as heavy as 10 pounds, such as a full bag of groceries?**"

Psychological Distress

Items on the Kessler Six Scale (K6) (Summed and Dichotomized, Range: 0-24)

- **How often, during the past 30 days, the respondent felt:**

  - **So sad that nothing could cheer you up?**

  - **Nervous?**

  - **Restless or fidgety?**

  - **Hopeless?**

  - **That everything was an effort?**

  - **Worthless?**

- **According to Kessler, et al. (2010), scores above 13 on the scale correlate with the presence of "serious mental illness."**

Supplementary Results: Poverty

- The models presented in the previous slides were also estimated with an additional control for the ratio of income to the poverty threshold.

- Model 1: Y =   Own Education + Poverty + Age + Race + Nativity

- Model 2: Y =   Own Education + Spouse's Education + Poverty + Age + Race + Nativity

- Model 3: Y = Own Education + Spouse's Education + Own Education*Spouse's Education + Poverty + Age +   Race + Nativity

- Ratio of Household Income to the Poverty Threshold: "Poor" (0.00 to 0.99), "Near Poor" (1.00 to 1.99), "Not Poor" (2.00 to 5.00)

Table 1A: Odds of Diagnosed Hypertension Controlling for Poverty

	Women (N = 43,373)			Men (N = 42,166)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	2.066***	1.578***	1.843***	1.360***	1.220***	1.009
HS	1.612***	1.366***	1.509***	1.268***	1.159***	1.275**
SCOL	1.349***	1.215***	1.209***	1.280***	1.205***	1.235***
Spouse's Ed						
LTHS		1.605***	1.439+		1.232***	1.250
HS		1.313***	1.364***		1.205***	1.301***
SCOL		1.230***	1.331***		1.125**	1.124*
Own X Spouse's Ed						
LTHS X LTHS			0.945			1.163
LTHS X HS			0.930			1.157
LTHS X SCOL			0.715			1.382
HS X LTHS			1.059			1.089
HS X HS			0.873			0.824+
HS X SCOL			0.820+			0.892
SCOL X LTHS			1.193			0.816
SCOL X HS			0.966			0.931
SCOL X SCOL			0.960			0.991
Log-Likelihood	-22,959	-22,912	-22,907	-25,132	-25,114	-25,103
BIC	46,045	45,983	46,070	50,392	50,389	50,462

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

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Table 2A: Odds of Diagnosed Diabetes Mellitus Controlling for Poverty

	Women (N = 43,373)			Men (N = 42,166)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	3.067***	2.065***	2.908***	1.880***	1.629***	1.482+
HS	2.197***	1.679***	2.403***	1.542***	1.361***	1.428**
SCOL	1.920***	1.612***	1.500**	1.629***	1.477***	1.584***
Spouse's Ed						
LTHS		1.999***	3.033***		1.350***	1.408
HS		1.584***	1.822**		1.319***	1.453***
SCOL		1.434***	1.637***		1.277***	1.279*
Own X Spouse's Ed						
LTHS X LTHS			0.471+			1.036
LTHS X HS			0.662			1.012
LTHS X SCOL			0.915			1.325
HS X LTHS			0.496*			1.031
HS X HS			0.631*			0.820
HS X SCOL			0.593*			1.091
SCOL X LTHS			0.901			0.920
SCOL X HS			1.042			0.952
SCOL X SCOL			0.990			0.859
Log-Likelihood	-10,220	-10,173	-10,164	-12,837	-12,825	-12,819
BIC	20,569	20,506	20,584	25,802	25,810	25,893

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$

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Table 3A: Odds of Healthy Weight (BMI = 18.5 – 24.9) vs. Overweight (BMI – 25.0 – 29.9) Controlling for Poverty

	Women (N = 43,375)			Men (N = 42,174)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	1.817***	1.365***	1.719**	1.113*	1.083	0.831
HS	1.538***	1.263***	1.400***	1.216***	1.153***	1.368***
SCOL	1.422***	1.257***	1.287***	1.234***	1.181***	1.289***
Spouse's Ed						
LTHS		1.626***	1.509*		1.032	1.091
HS		1.415***	1.521***		1.130**	1.334***
SCOL		1.286***	1.411***		1.115**	1.130*
Own X Spouse's Ed						
LTHS X LTHS			0.851			1.351
LTHS X HS			0.706			1.085
LTHS X SCOL			0.853			1.238
HS X LTHS			1.002			0.750
HS X HS			0.845			0.722**
HS X SCOL			0.813+			0.852
SCOL X LTHS			1.147			0.743
SCOL X HS			0.953			0.766*
SCOL X SCOL			0.884			0.945
Log-Likelihood	-44,581	-44,352	-44,332	-43,344	-43,322	-43,302
BIC	89,418	89,024	89,175	86,944	86,963	87,116

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

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Table 5: Odds of Reporting Joint Pain Persisting for 30+ Days (2002 – 2009)

	Women (N = 43,375)			Men (N = 42,174)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	1.616***	1.392***	1.097	1.526***	1.398***	1.389
HS	1.218***	1.115*	1.132	1.315***	1.239***	1.341**
SCOL	1.356***	1.286***	1.374***	1.374***	1.299***	1.366***
Spouse's Ed						
LTHS		1.273***	1.156		1.201**	1.084
HS		1.154**	1.365**		1.117*	1.110
SCOL		1.101*	1.093		1.171***	1.271***
Own X Spouse's Ed						
LTHS X LTHS			1.331			1.046
LTHS X HS			1.157			1.103
LTHS X SCOL			1.712+			1.059
HS X LTHS			1.204			1.270
HS X HS			0.790+			0.928
HS X SCOL			1.111			0.820
SCOL X LTHS			1.087			1.127
SCOL X HS			0.851			0.990
SCOL X SCOL			0.889			0.866
Log-Likelihood	-15,660	-15,645	-15,634	-15,576	-15,566	-15,560
BIC	31,421	31,422	31,491	31,253	31,263	31,341

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$

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Table 5A: Odds of Reporting Joint Pain Persisting for 30+ Days Controlling for Poverty (2002 – 2009)

	Women (N = 43,375)			Men (N = 42,174)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	1.413***	1.288***	1.055	1.383***	1.310***	1.356
HS	1.163***	1.087+	1.123	1.268***	1.212***	1.331**
SCOL	1.330***	1.275***	1.369***	1.352***	1.288***	1.350***
Spouse's Ed						
LTHS		1.172**	1.122		1.128+	1.029
HS		1.127*	1.358**		1.093+	1.097
SCOL		1.088+	1.087		1.161***	1.261***
Own X Spouse's Ed						
LTHS X LTHS			1.213			0.992
LTHS X HS			1.089			1.041
LTHS X SCOL			1.667+			1.031
HS X LTHS			1.116			1.239
HS X HS			0.763*			0.907
HS X SCOL			1.093			0.805+
SCOL X LTHS			1.045			1.126
SCOL X HS			0.835			0.986
SCOL X SCOL			0.880			0.870
Log-Likelihood	-15,631	-15,622	-15,610	-15,554	-15,545	-15,538
BIC	31,384	31,396	31,463	31,228	31,241	31,319

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$

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Table 4A: Odds of Healthy Weight (BMI = 18.5 – 24.9) vs. Obese (BMI = 30.0+) Controlling for Poverty

	Women (N = 43,375)			Men (N = 42,174)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	2.831***	1.710***	2.208***	1.922***	1.719***	1.250
HS	2.153***	1.505***	2.019***	1.770***	1.565***	1.926***
SCOL	1.950***	1.537***	1.615***	1.698***	1.539***	1.779***
Spouse's Ed						
LTHS		2.413***	2.817***		1.222**	2.078***
HS		1.887***	2.246***		1.304***	1.651***
SCOL		1.687***	1.990***		1.266***	1.270***
Own X Spouse's Ed						
LTHS X LTHS			0.661			0.851
LTHS X HS			0.685			1.126
LTHS X SCOL			0.904			1.509+
HS X LTHS			0.733			0.495**
HS X HS			0.639***			0.637***
HS X SCOL			0.612***			0.883
SCOL X LTHS			0.870			0.426**
SCOL X HS			0.883			0.708**
SCOL X SCOL			0.842+			0.888
Log-Likelihood	-44,581	-44,352	-44,332	-43,344	-43,322	-43,302
BIC	89,418	89,024	89,175	86,944	86,963	87,116

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

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Supplementary Results – Additional Outcomes

Table 7: Odds of Reporting Any Activity Limitation

	Women (N = 43,375)			Men (N = 42,174)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	3.949***	2.663***	2.397***	3.634***	2.814***	3.598***
HS	2.051***	1.639***	1.498***	2.013***	1.689***	1.614***
SCOL	1.938***	1.673***	1.635***	1.803***	1.600***	1.611***
Spouse's Ed						
LTHS		1.921***	2.087**		1.653***	1.738**
HS		1.386***	1.169		1.417***	1.463***
SCOL		1.349***	1.298*		1.271***	1.261**
Own X Spouse's Ed						
LTHS X LTHS			0.907			0.696
LTHS X HS			1.605+			0.806
LTHS X SCOL			1.219			0.842
HS X LTHS			1.013			1.239
HS X HS			1.237			0.967
HS X SCOL			1.171			1.101
SCOL X LTHS			1.206			0.919
SCOL X HS			1.137			1.012
SCOL X SCOL			0.990			0.974
Log-Likelihood	-15,951	-15,882	-15,867	-16,383	-16,346	-16,332
BIC	32,010	31,902	31,969	32,873	32,830	32,898

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$

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Table 7A: Odds of Reporting Any Activity Limitation Controlling for Poverty

	Women (N = 43,375)			Men (N = 42,174)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	2.808***	2.194***	2.130***	2.520***	2.217***	3.314***
HS	1.800***	1.529***	1.460***	1.731***	1.537***	1.530***
SCOL	1.828***	1.628***	1.617***	1.688***	1.547***	1.549***
Spouse's Ed						
LTHS		1.555***	1.895**		1.291***	1.436+
HS		1.299***	1.156		1.301***	1.388***
SCOL		1.308***	1.290*		1.224***	1.221*
Own X Spouse's Ed						
LTHS X LTHS			0.756			0.565*
LTHS X HS			1.414			0.660*
LTHS X SCOL			1.162			0.746
HS X LTHS			0.863			1.130
HS X HS			1.135			0.905
HS X SCOL			1.117			1.055
SCOL X LTHS			1.117			0.894
SCOL X HS			1.080			0.999
SCOL X SCOL			0.951			0.979
Log-Likelihood	-15,703	-15,672	-15,656	-15,995	-15,981	-15,963
BIC	31,534	31,504	31,568	32,118	32,121	32,182

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$

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Table 8: Odds of Reporting the Presence of Any Functional Limitations

	Women (N = 43,375)			Men (N = 42,174)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	2.806***	2.036***	2.123***	2.426***	2.055***	2.099***
HS	1.732***	1.451***	1.411***	1.697***	1.547***	1.373***
SCOL	1.649***	1.480***	1.438***	1.542***	1.442***	1.558***
Spouse's Ed						
LTHS		1.698***	1.251		1.399***	1.469*
HS		1.302***	1.191*		1.182***	1.090
SCOL		1.223***	1.254***		1.151***	1.211***
Own X Spouse's Ed						
LTHS X LTHS			1.214			0.878
LTHS X HS			1.157			1.137
LTHS X SCOL			0.974			0.985
HS X LTHS			1.425+			1.289
HS X HS			1.093			1.212+
HS X SCOL			1.018			1.070
SCOL X LTHS			1.646**			0.829
SCOL X HS			1.141			1.029
SCOL X SCOL			0.957			0.849+
Log-Likelihood	-26,778	-26,694	-26,683	-24,957	-24,929	-24,917
BIC	53,663	53,527	53,600	50,020	49,996	50,068

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

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Table 8A: Odds of Any Functional Limitations Controlling Poverty

	Women (N = 43,375)			Men (N = 42,174)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	2.304***	1.824***	1.981***	1.967***	1.791***	2.015***
HS	1.618***	1.402***	1.394***	1.571***	1.476***	1.339***
SCOL	1.600***	1.460***	1.429***	1.491***	1.418***	1.530***
Spouse's Ed						
LTHS		1.515***	1.195		1.223***	1.333+
HS		1.263***	1.182*		1.133**	1.062
SCOL		1.204***	1.246***		1.129**	1.193**
Own X Spouse's Ed						
LTHS X LTHS			1.090			0.767
LTHS X HS			1.084			1.007
LTHS X SCOL			0.955			0.917
HS X LTHS			1.294			1.217
HS X HS			1.047			1.172
HS X SCOL			0.996			1.043
SCOL X LTHS			1.570*			0.817
SCOL X HS			1.116			1.021
SCOL X SCOL			0.942			0.849+
Log-Likelihood	-26,642	-26,588	-26,577	-24,750	-24,737	-24,725
BIC	53,413	53,337	53,411	49,627	49,634	49,705

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$

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Table 8: Odds of Diagnosed Cancer (Excludes Basal Cell Carcinoma – Skin Cancer)

	Women (N = 43,375)			Men (N = 42,174)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	1.075	0.998	0.520+	0.993	0.929	1.713*
HS	0.960	0.914	1.010	0.928	0.879*	0.981
SCOL	1.059	1.026	1.105	0.943	0.892+	0.808
Spouse's Ed						
LTHS		1.125	1.640+		1.166+	0.895
HS		1.083	1.239		1.132+	1.191+
SCOL		1.064	1.081		1.194**	1.227*
Own X Spouse's Ed						
LTHS X LTHS			1.288			0.743
LTHS X HS			1.771			0.487**
LTHS X SCOL			2.665*			0.470*
HS X LTHS			0.668			1.223
HS X HS			0.788			0.837
HS X SCOL			0.901			0.905
SCOL X LTHS			0.635			1.212
SCOL X HS			0.842			1.147
SCOL X SCOL			0.909			1.086
Log-Likelihood	-11,011	-11,010	-11,003	-9,790	-9,787	-9,780
BIC	22,130	22,160	22,241	19,687	19,712	19,794

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$

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Table 8A: Odds of Diagnosed Cancer (Excludes Basal Cell Carcinoma – Skin Cancer) Controlling for Poverty

	Women (N = 43,375)			Men (N = 42,174)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	0.999	0.957	0.510+	0.943	0.897	1.686*
HS	0.934	0.901	1.006	0.909	0.867*	0.973
SCOL	1.046	1.021	1.102	0.934	0.887+	0.804
Spouse's Ed						
LTHS		1.073	1.607+		1.131	0.879
HS		1.066	1.233		1.122+	1.184
SCOL		1.056	1.077		1.190*	1.223*
Own X Spouse's Ed						
LTHS X LTHS			1.226			0.720
LTHS X HS			1.707			0.475**
LTHS X SCOL			2.630*			0.463*
HS X LTHS			0.641			1.198
HS X HS			0.773			0.829
HS X SCOL			0.891			0.899
SCOL X LTHS			0.623			1.199
SCOL X HS			0.833			1.144
SCOL X SCOL			0.901			1.086
Log-Likelihood	-11,008	-11,007	-11,000	-9,788	-9,784	-9,777
BIC	22,143	22,174	22,255	19,703	19,727	19,810

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$

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Table 9: Odds of Reporting Joint Pain Persisting for 30+ Days (2002 – 2009)

	Women (N = 43,375)			Men (N = 42,174)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	1.616***	1.392***	1.097	1.526***	1.398***	1.389
HS	1.218***	1.115*	1.132	1.315***	1.239***	1.341**
SCOL	1.356***	1.286***	1.374***	1.374***	1.299***	1.366***
Spouse's Ed						
LTHS		1.273***	1.156		1.201**	1.084
HS		1.154**	1.365**		1.117*	1.110
SCOL		1.101*	1.093		1.171***	1.271***
Own X Spouse's Ed						
LTHS X LTHS			1.331			1.046
LTHS X HS			1.157			1.103
LTHS X SCOL			1.712+			1.059
HS X LTHS			1.204			1.270
HS X HS			0.790+			0.928
HS X SCOL			1.111			0.820
SCOL X LTHS			1.087			1.127
SCOL X HS			0.851			0.990
SCOL X SCOL			0.889			0.866
Log-Likelihood	-15,660	-15,645	-15,634	-15,576	-15,566	-15,560
BIC	31,421	31,422	31,491	31,253	31,263	31,341

*** p<0.001, ** p<0.01, * p<0.05, + p<0.10

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	Women (N = 43,375)			Men (N = 42,174)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	1.413***	1.288***	1.055	1.383***	1.310***	1.356
HS	1.163***	1.087+	1.123	1.268***	1.212***	1.331**
SCOL	1.330***	1.275***	1.369***	1.352***	1.288***	1.350***
Spouse's Ed						
LTHS		1.172**	1.122		1.128+	1.029
HS		1.127*	1.358**		1.093+	1.097
SCOL		1.088+	1.087		1.161***	1.261***
Own X Spouse's Ed						
LTHS X LTHS			1.213			0.992
LTHS X HS			1.089			1.041
LTHS X SCOL			1.667+			1.031
HS X LTHS			1.116			1.239
HS X HS			0.763*			0.907
HS X SCOL			1.093			0.805+
SCOL X LTHS			1.045			1.126
SCOL X HS			0.835			0.986
SCOL X SCOL			0.880			0.870
Log-Likelihood	-15,631	-15,622	-15,610	-15,554	-15,545	-15,538
BIC	31,384	31,396	31,463	31,228	31,241	31,319

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$

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Table 5: Odds of Serious Mental Illness (K6 Score of 0 – 12 vs. 13 – 24)

	Women (N = 43,375)			Men (N = 42,174)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	9.429***	5.629***	4.284**	6.215***	4.035***	6.948***
HS	3.565***	2.701***	2.575***	2.837***	2.364***	1.821+
SCOL	2.901***	2.373***	2.242***	2.025***	1.825***	2.179**
Spouse's Ed						
LTHS		2.410***	3.338*		2.317***	5.076***
HS		1.470**	1.305		1.301+	1.495
SCOL		1.558***	1.317		1.127	1.029
Own X Spouse's Ed						
LTHS X LTHS			0.805			0.229**
LTHS X HS			2.001			0.681
LTHS X SCOL			1.664			0.747
HS X LTHS			0.865			0.895
HS X HS			1.088			1.123
HS X SCOL			1.095			1.304
SCOL X LTHS			0.924			0.482
SCOL X HS			0.934			0.567
SCOL X SCOL			1.261			1.033
Log-Likelihood	-5,196	-5,166	-5,158	-3,656	-3,635	-3,620
BIC	10,499	10,471	10,551	7,418	7,409	7,474

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$

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Table 5A: Odds of Serious Mental Illness (Kessler Six Score of13- 24) Controlling for Poverty

	Women (N = 43,375)			Men (N = 42,174)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Own Ed						
LTHS	5.986***	4.360***	3.503*	3.136***	2.599***	5.897***
HS	2.977***	2.451***	2.473**	2.087***	1.968***	1.632
SCOL	2.667***	2.276***	2.195***	1.745***	1.692***	1.998**
Spouse's Ed						
LTHS		1.821***	2.962*		1.515*	3.532**
HS		1.341*	1.281		1.074	1.343
SCOL		1.485**	1.293		1.026	0.961
Own X Spouse's Ed						
LTHS X LTHS			0.668			0.169**
LTHS X HS			1.761			0.464
LTHS X SCOL			1.610			0.583
HS X LTHS			0.695			0.774
HS X HS			0.978			0.992
HS X SCOL			1.037			1.190
SCOL X LTHS			0.819			0.470
SCOL X HS			0.876			0.547
SCOL X SCOL			1.211			1.044
Log-Likelihood	-5,090	-5,078	-5,070	-3,508	-3,502	-3,487
BIC	10,309	10,316	10,397	7,144	7,164	7,229

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.10$

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Descriptive Statistics

Table 1A: Descriptive statistics for the sample, NHIS Adult Sample (1997 – 2009)

	Women		Men	
	N	%	N	%
Any Heart Condition	15,120	34.7	17,562	41.2
Non-Hypertension	2,593	6.1	3,104	7.2
Hypertension	12,525	28.6	14,450	34.0
Diabetes Mellitus	3,176	7.1	4,289	9.7
Body Mass Index (BMI)				
Underweight (≤18.49)	574	1.3	70	0.2
Healthy Weight (18.5 – 24.9)	18,390	43.2	10,093	23.4
Overweight (25.0 – 29.9)	13,816	31.3	20,634	48.6
Obese (≥ 30.0)	10,595	24.2	11,377	27.8
Mean BMI		26.6		27.9
Functional Limitations	16,898	39.3	14,616	34.1
Psychological Distress (K6)				
Serious Mental Illness (13 – 24)	1,189	2.7	756	1.7
Mean K6 Score (Range: 0 to 24)	43,375	2.3	42,174	1.8

Activity Limitations

"Limited in any way" on one or more of the following:

- "Because of a physical, mental, or emotional problem, does [person] need the help of other persons with personal care needs, such as eating, bathing, dressing, or getting around inside this home?"

- "Because of a physical, mental, or emotional problem, does [person] need the help of other persons in handling routine needs, such as everyday household chores, doing necessary business, shopping, or getting around for other purposes?"

- "Does a physical, mental, or emotional problem now keep [person] from working at a job or business?"

- "Is [person] limited in the kind or amount of work [he/she] can do because of a physical, mental or emotional problem?"

- "Because of a health problem, does [person] have difficulty walking without using any special equipment?"

- "Is [person] limited in any way because of difficulty remembering or because [he/she] experiences periods of confusion?"

- "Is [person] limited in any way in any activities because of physical, mental or emotional problems?"

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