

Is SES a Surrogate for IQ in Predicting Health?

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Social Cause Theory of Health Disparities

- Striking fact
 - All indicators of social class privilege predict disparities in health—in virtually all places, times, etc.
- Striking problem with “wealth→health” theory
 - Social class indicators too uniformly predictive to represent material resources
- So, new “social-psychological” theory
 - Inequality itself creates unhealthy psychological hazards.
 - Search now underway for a highly generalizable, transportable resource or “fundamental cause”—stress of relative deprivation??

One Alternative—“*g* is useful tool for prospering in everyday life”

Much is known about *g*:

- Highly general, highly transportable resource
- Good construct validity
 - A general proficiency to learn and reason well
 - Many correlates in brain and behavior
- Measured reliably
- Good predictive validity:
 - E.g., Predicts trainability and performance in all jobs
 - Predicts better when jobs more complex
- Highly stable, highly heritable by adolescence

But relevant to health?

A mechanism:

- Health self-care matters
- Health self-care is like any other job
 - Good performance depends on learning and reasoning (g)
 - Demands are greatest when tasks most complex (constantly changing, ambiguous, multi-faceted, abstract, unclear means-ends...)
 - Examples: accident prevention, chronic diseases such as diabetes
- g level more critical (predictive) when tasks are more complex
- Advances in health care increase both complexity and opportunity to choose

Those stubborn disparities:

- Greater choice and complexity increases variation (disparities) in performance (“second law of individual differences”)

A Prediction:

“SES indicators predict health disparities to the extent they act as surrogates for g ”

Opportunity to Test Prediction: Vietnam-Era Veterans Data

- Study mandated by US Congress: Did defoliants affect health of Vietnam veterans?
- Inducted 1965-1971 (N =18,313)
 - Average age at induction = 20
 - Half served in Vietnam war theatre
 - 4 cognitive tests, used to extract *g* factor
- Telephone interview ~1985 (N =15,288)
 - Average age at interview = 37
- Physical/mental exam ~1985 (N = 4,462)
- Mortality follow-up 2000
 - Average age ~ 52

Correlations of *g* and 3 SES Indicators With 4 Health Outcomes and 2 Predictors (age partialled out)

| | <i>g</i> | PTSD symptoms (15) | Anxiety/ depression (7) | Somatic (19) | Self-rated health | Married | Served in Vietnam |
|---------------|-------------|--------------------|-------------------------|--------------|-------------------|------------|-------------------|
| <i>g</i> | 1.00 | -.20 | -.21 | -.04 | .27 | .02 | -.06 |
| Years Educ | .56 | -.15 | -.16 | -.00 | .25 | -.00 | -.06 |
| Occu Pres | .37 | -.13 | -.12 | -.01 | .18 | .07 | -.04 |
| Family Income | .36 | -.22 | -.19 | -.05 | .26 | .30 | -.02 |

Family income violates prediction—or does it?
What does it stand for?

What do ANY of the SES indicators stand for??

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| Income per capita | .22 | -.10 | -.11 | -.01 | .13 | -.44 | -.01 |

What resource(s) does marriage stand for?

- Social support?
- Financial buffer (2nd income)?
- Own desirability as a mate?

Cox Regressions of Mortality on *g*, SES, and Covariates (Hazards Ratios)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|----------------------------|-----|------|-----|------|------|------|------|------|------|
| Age | .99 | .99 | .10 | 1.02 | 1.01 | 1.01 | 1.02 | 1.02 | 1.02 |
| Vietnam | | 1.02 | .10 | 1.00 | 1.00 | 1.00 | .91 | .90 | .89 |
| <i>g</i> ★ | | | .76 | .86 | .84 | .85 | .88 | .87 | .90 |
| Income ★ | | | | .79 | .85 | .85 | .88 | .87 | .89 |
| Married ★ | | | | | .55 | .55 | .56 | .56 | .56 |
| Educ | | | | | | 1.01 | 1.01 | 1.00 | 1.02 |
| Occ prest | | | | | | 1.00 | 1.00 | 1.00 | 1.00 |
| PTSD | | | | | | | 1.01 | 1.01 | 1.00 |
| Anx/depr | | | | | | | 1.06 | 1.04 | 1.00 |
| Somatic ★ | | | | | | | | 1.11 | 1.08 |
| Worse health, self-rated ★ | | | | | | | | | 1.39 |

If income omitted, both *g* and marriage appear stronger.

If *g* omitted, PTSD, anxiety/depression, and self-rated health appear stronger

So, inherently ambiguous analytic method
Also, at wrong level of analysis!

The Problems.

Some ways forward.

Level of analysis must match question

1. Explaining disparities = between-group differences (means, rates)
2. Explaining health = within-group differences (SDs, variance, beta weights)

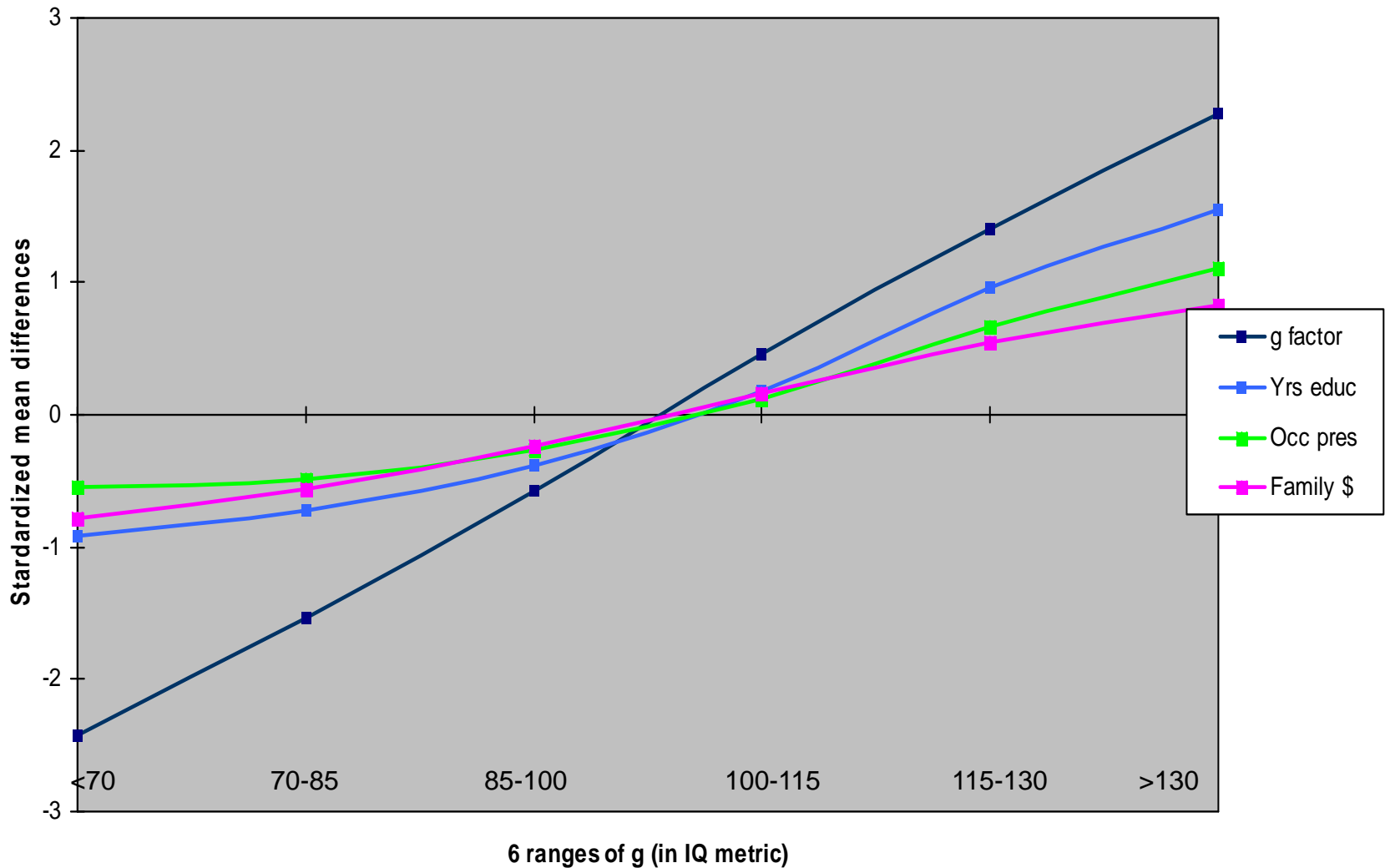
Why? Groups may not differ (#1) on some causes of ill health (#2); or they may differ a lot on only one (#2) that contributes to within-group variation (#1)

A proposal and modest attempt....

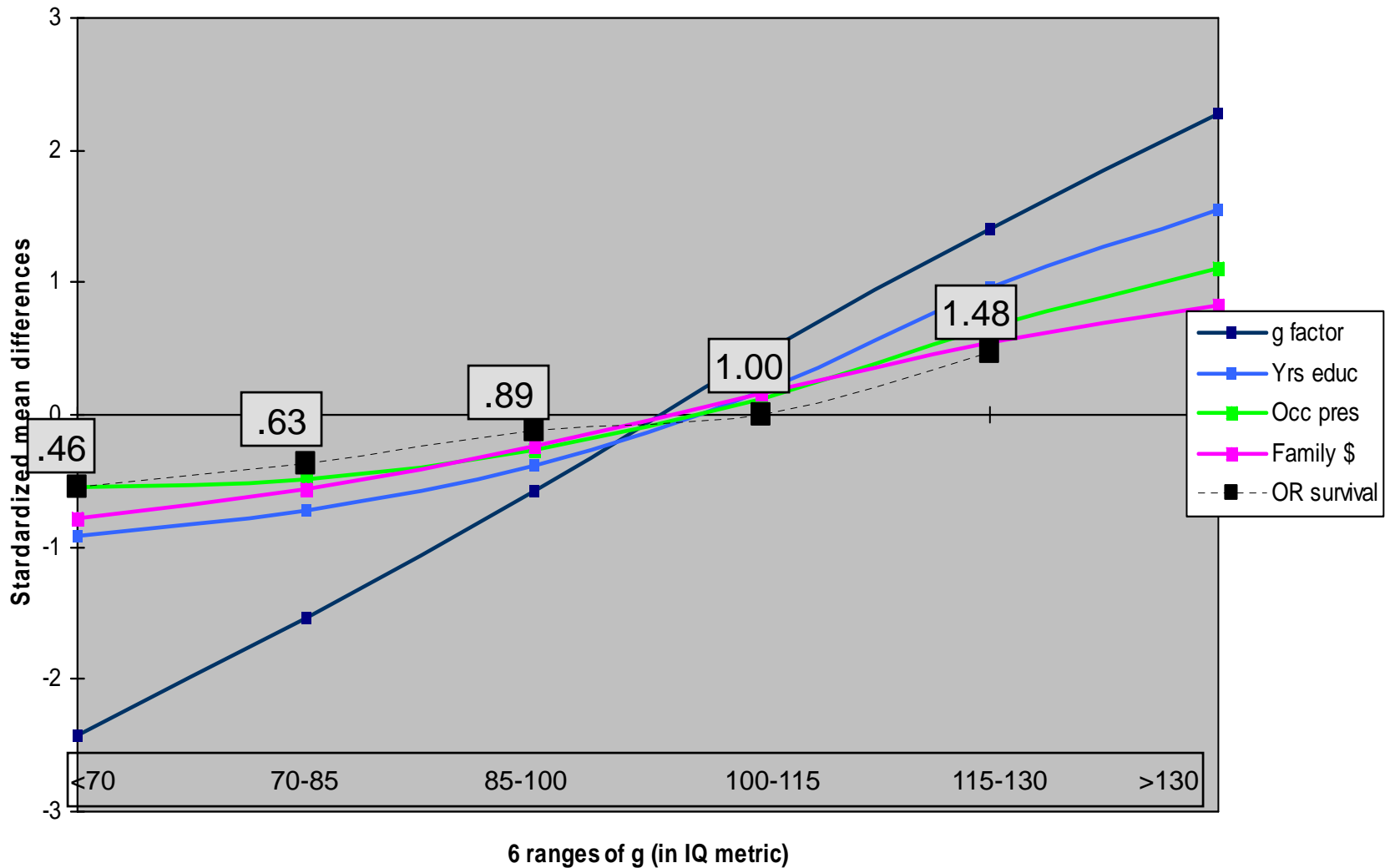
“Environmental scans”

- For recurring consilience across studies, variables, fields, levels of analysis (networks of convergence)
 - E.g., why do some sorts of group mean differences coincide but others less so?
- For anomalies and constraints—replicated violations of expectation (persistent divergence)
 - E.g., why do some risk gradients disfavor the higher classes? Why do some gradients reverse over time?
- For cascading, relentlessly compounding small effects
 - E.g., can we develop a calculus for measuring converging rivers of minuscule, inconspicuous risks?

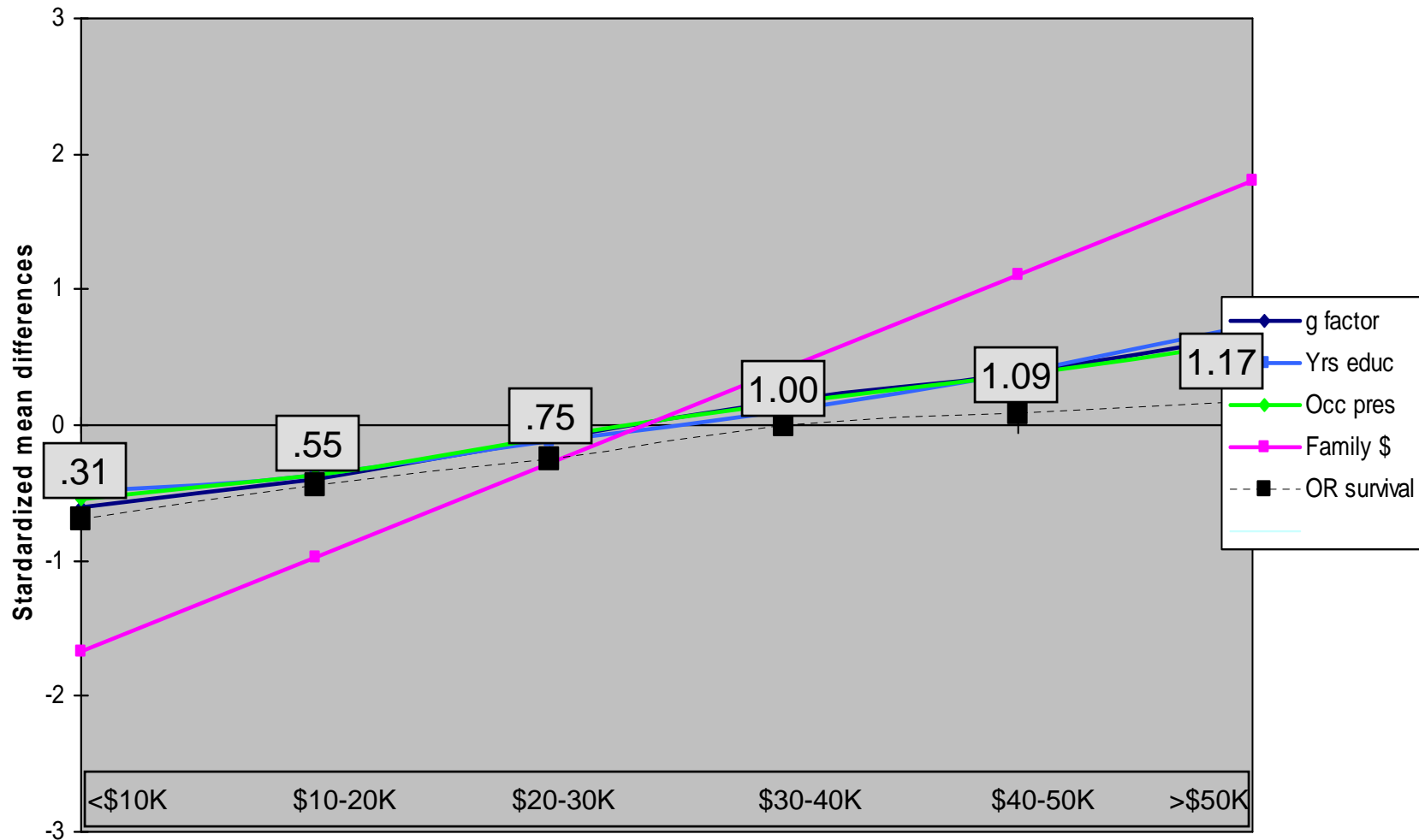
Gradients of “Effect Sizes” for 3 SES Measures—Along the *g* Continuum



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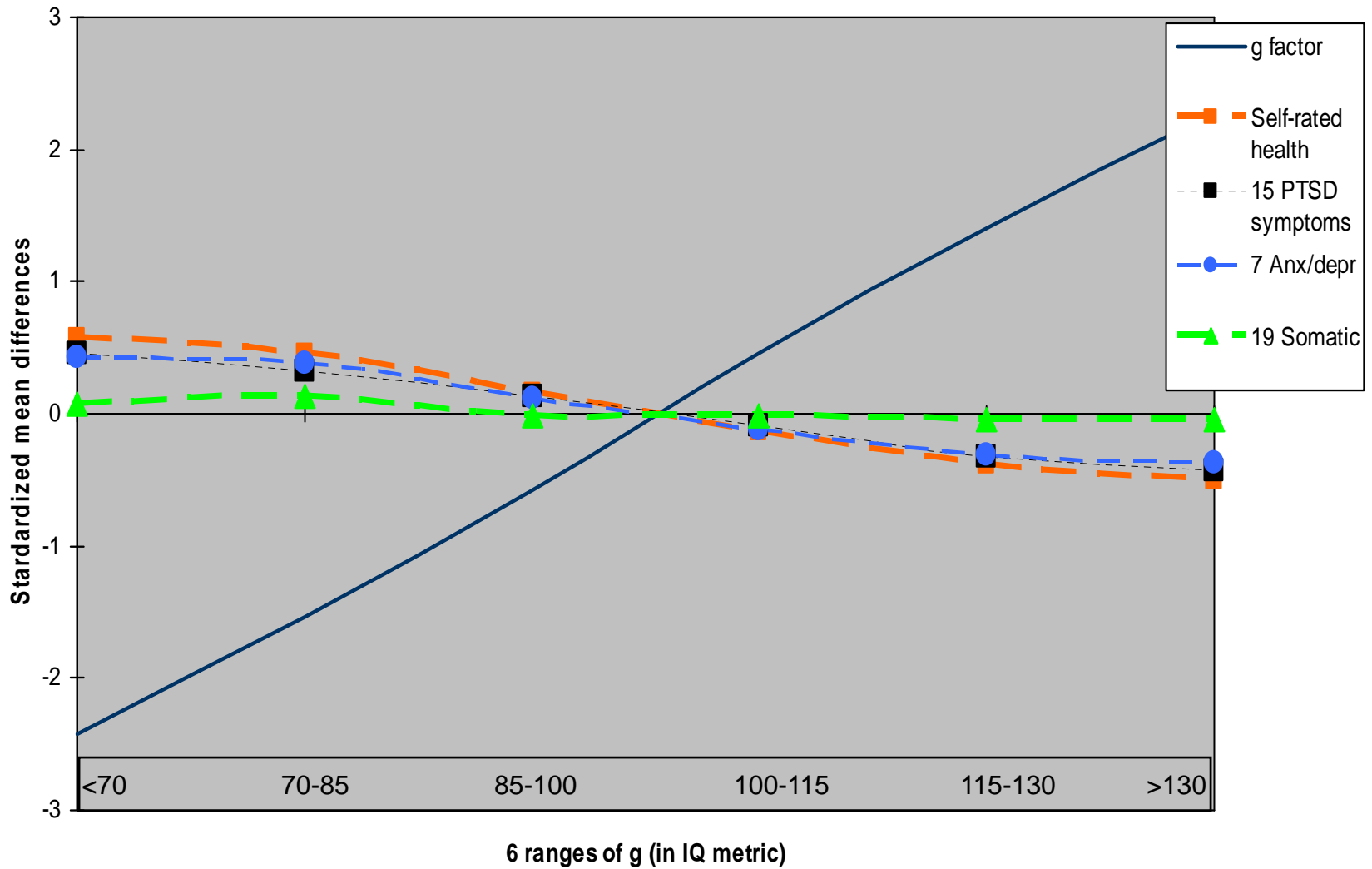


Gradients of “Effect Sizes” for *g* and Other SES Measures—Along the Family-Income Continuum

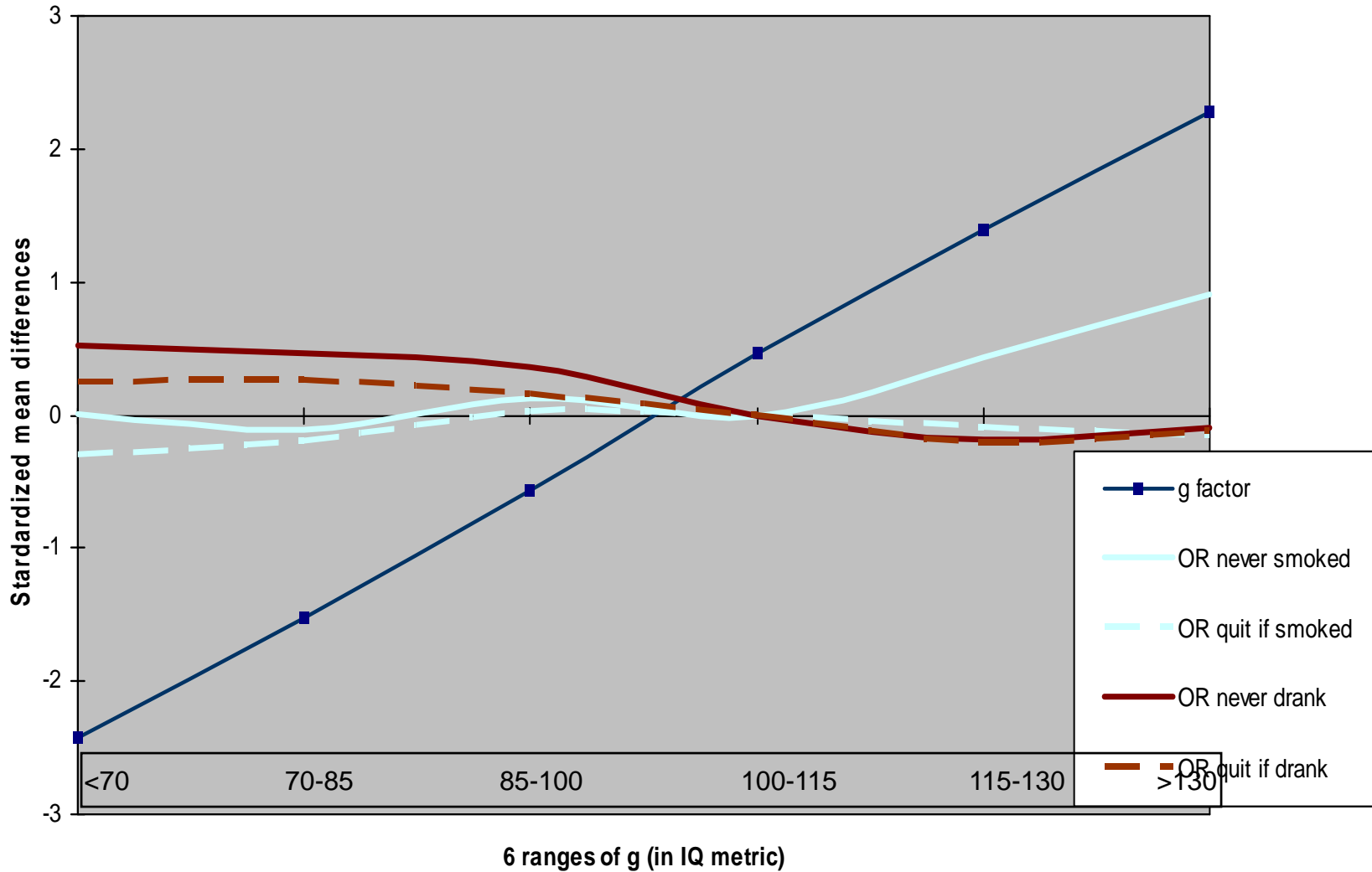


6 ranges of family income (1985 dollars)

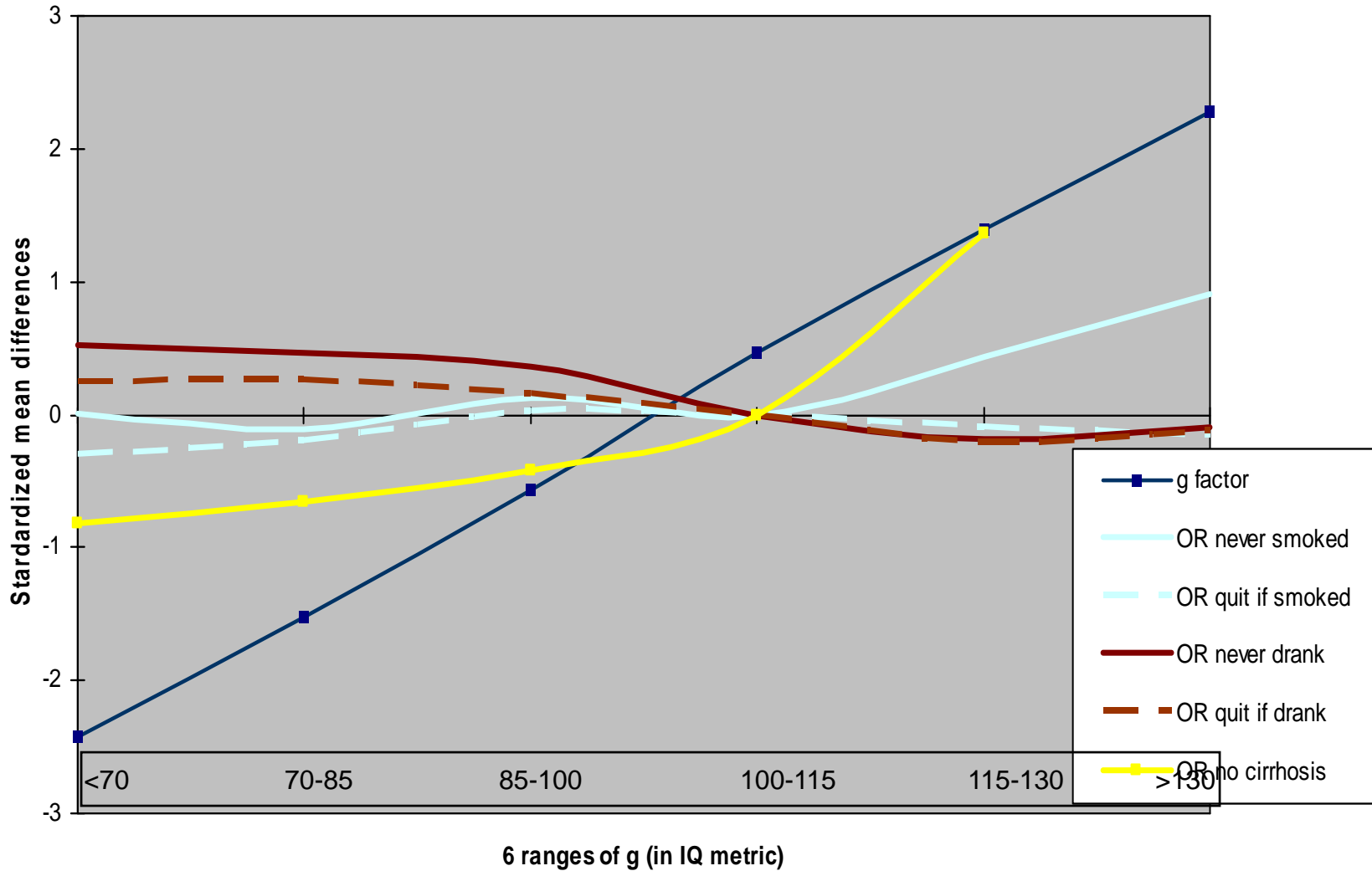
Gradients of Psychological and Somatic Problems Along the *g* Continuum



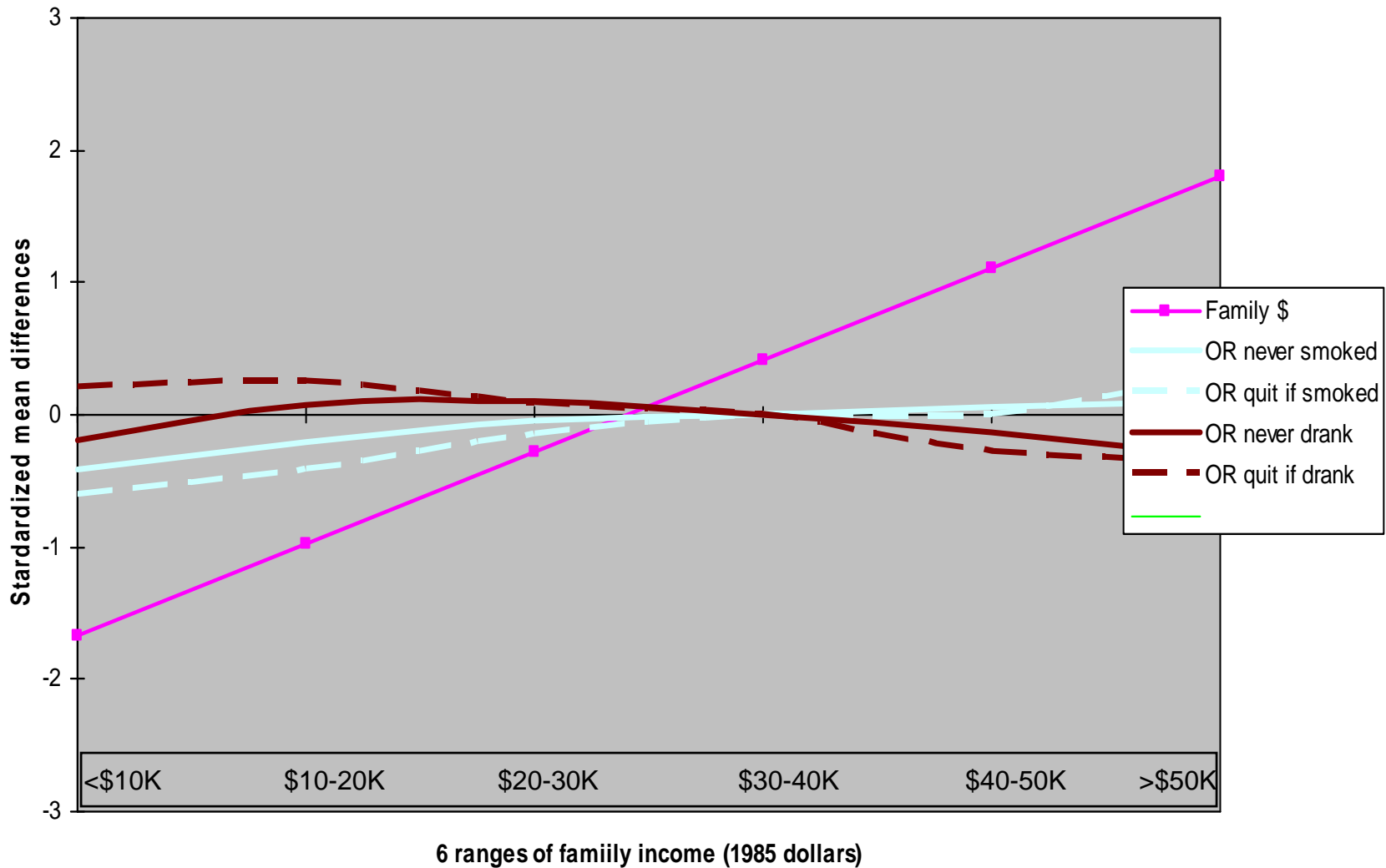
Gradients of Avoiding Smoking and Drinking—Or Quitting—Along the *g* Continuum (Odds Ratios)



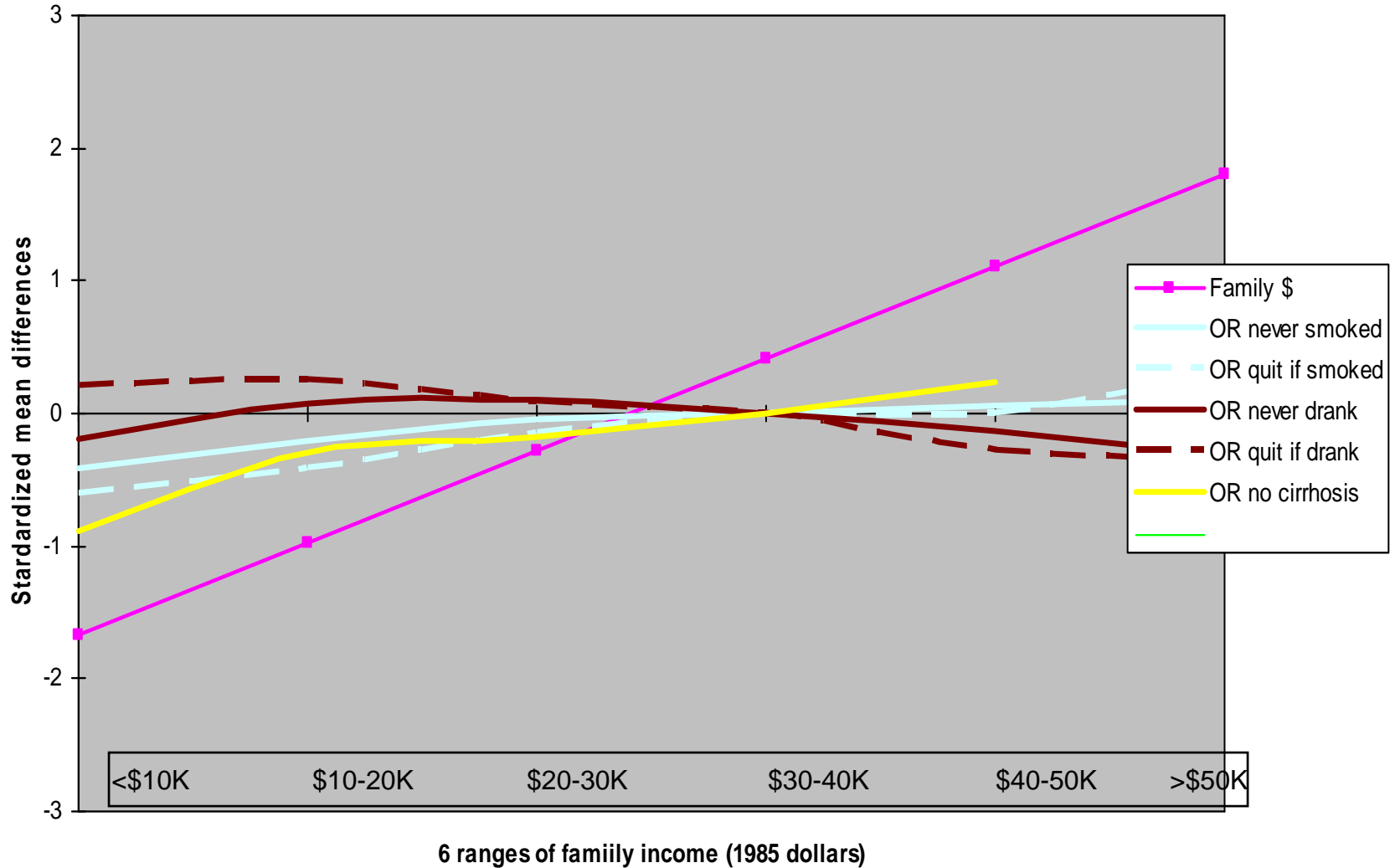
And No Cirrhosis!



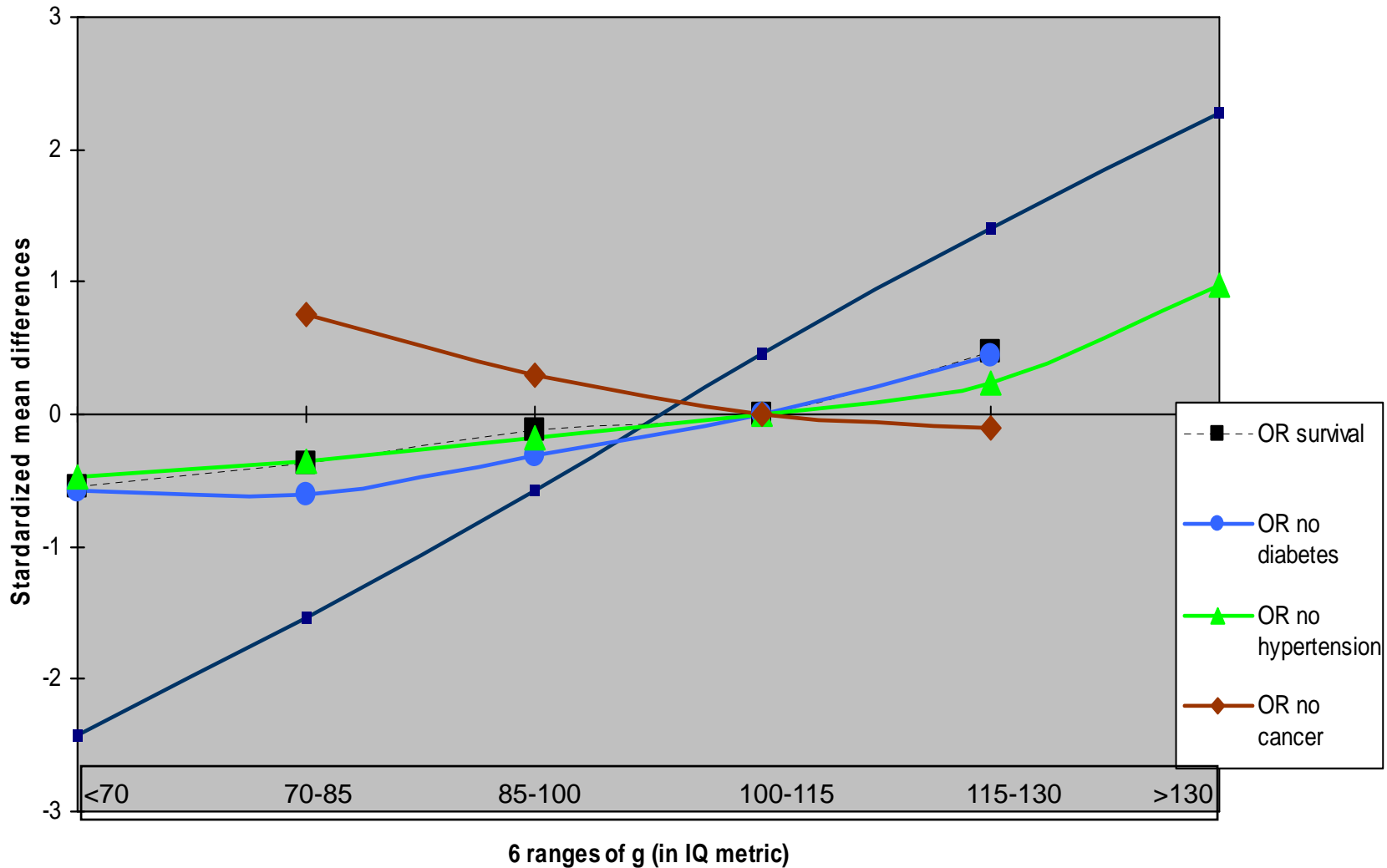
Same Good Behaviors, Along the Family-Income Continuum



And No Cirrhosis!

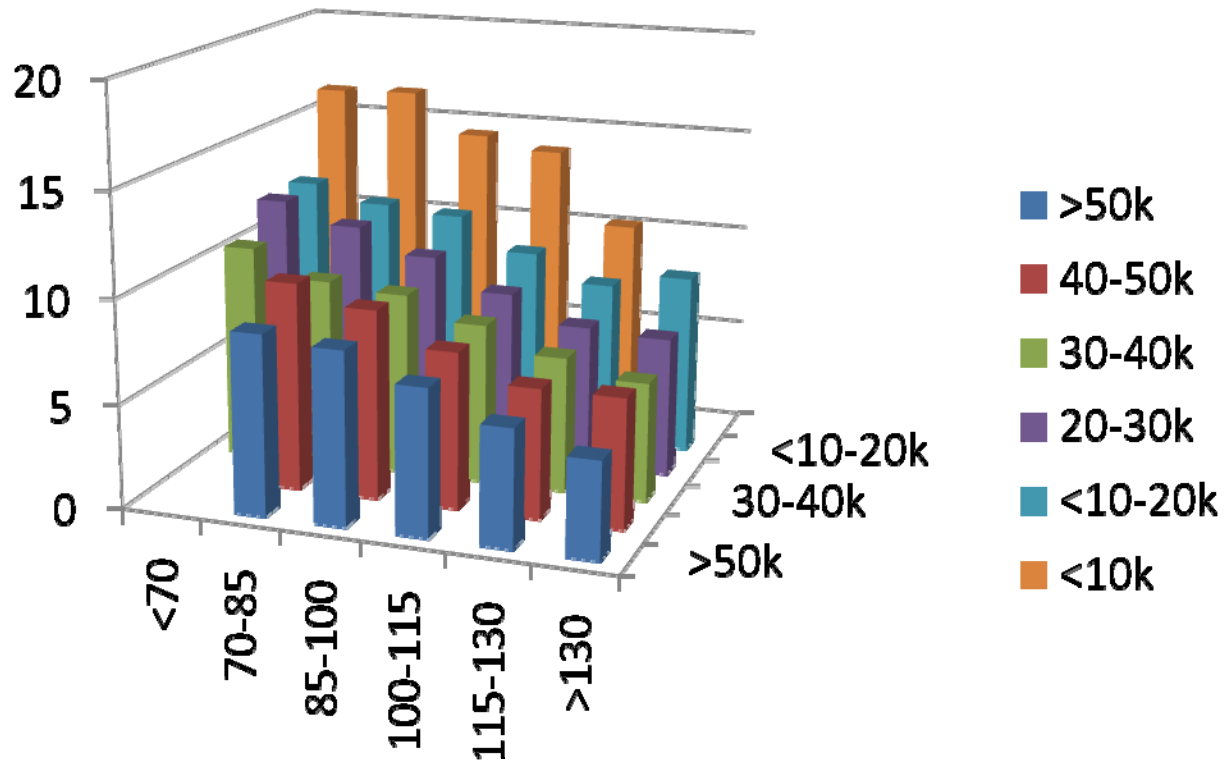


Odds Ratios for Other Chronic Diseases—Along the *g* Continuum



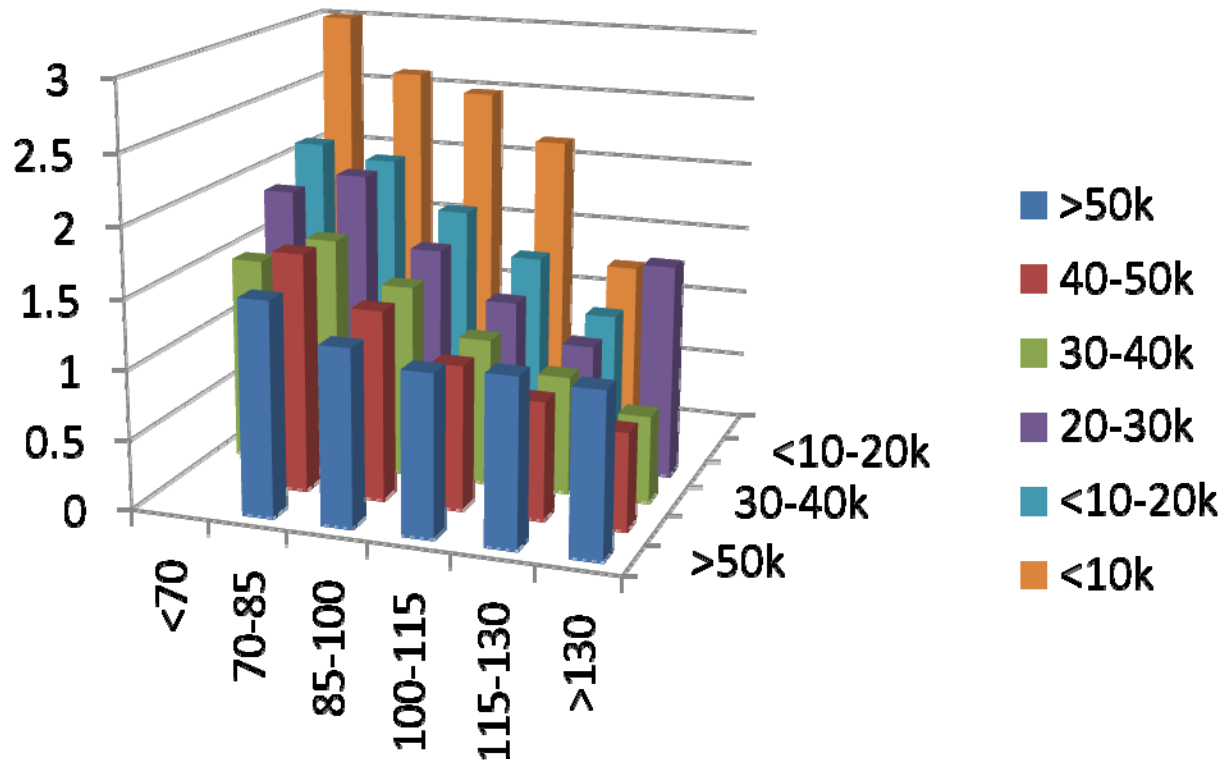
PTSD Symptoms

(Count of 15 items)



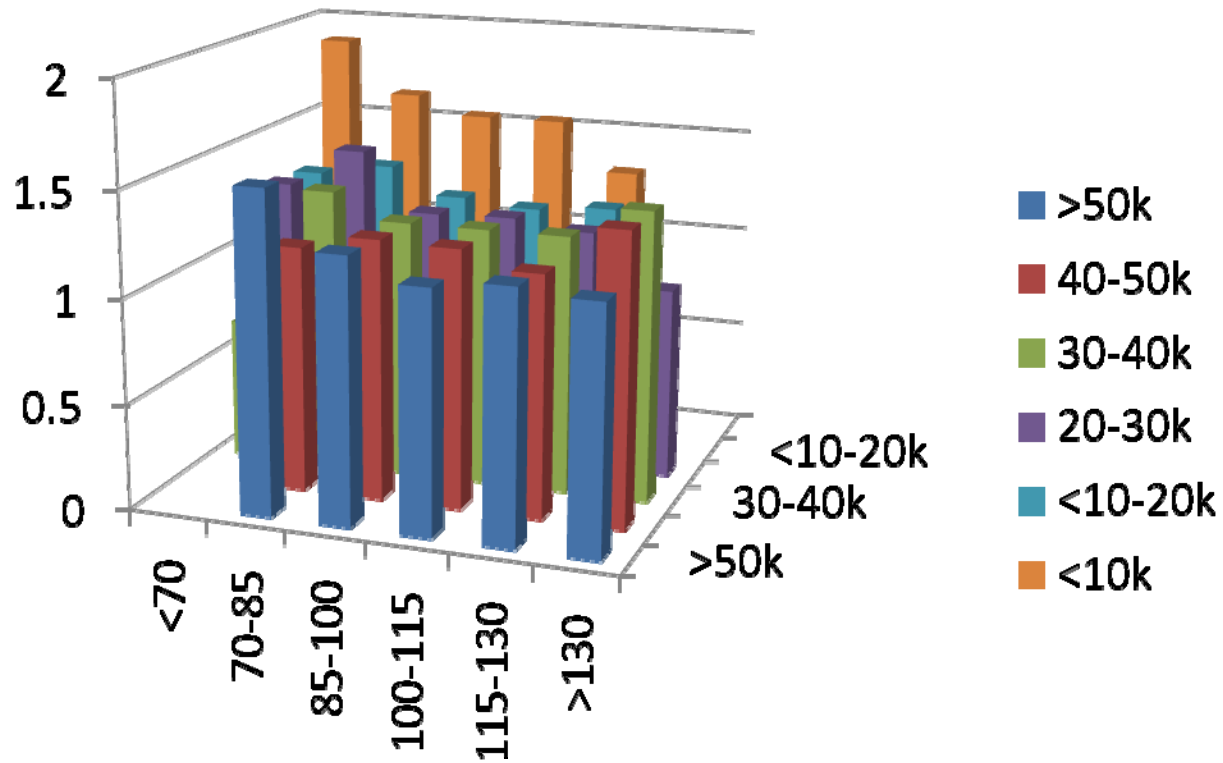
Anxiety-Depression

(Count of 7 items)

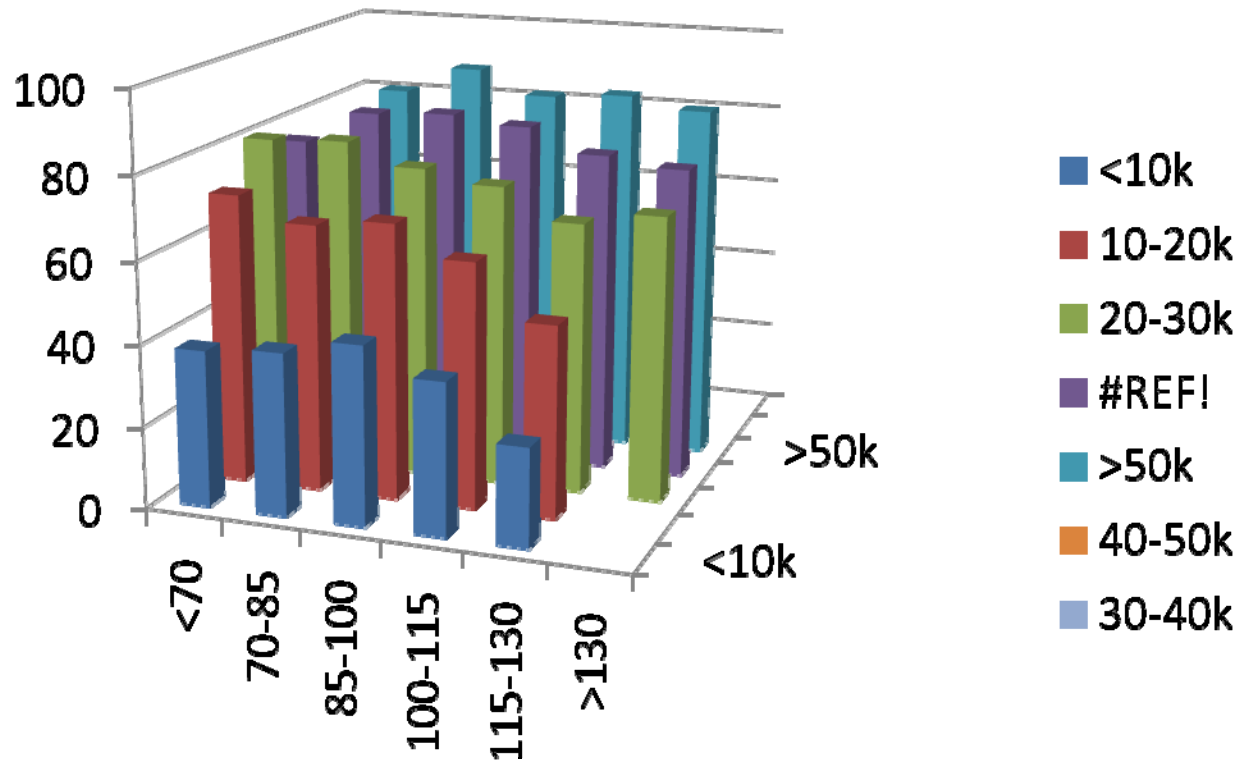


Somatic Problems

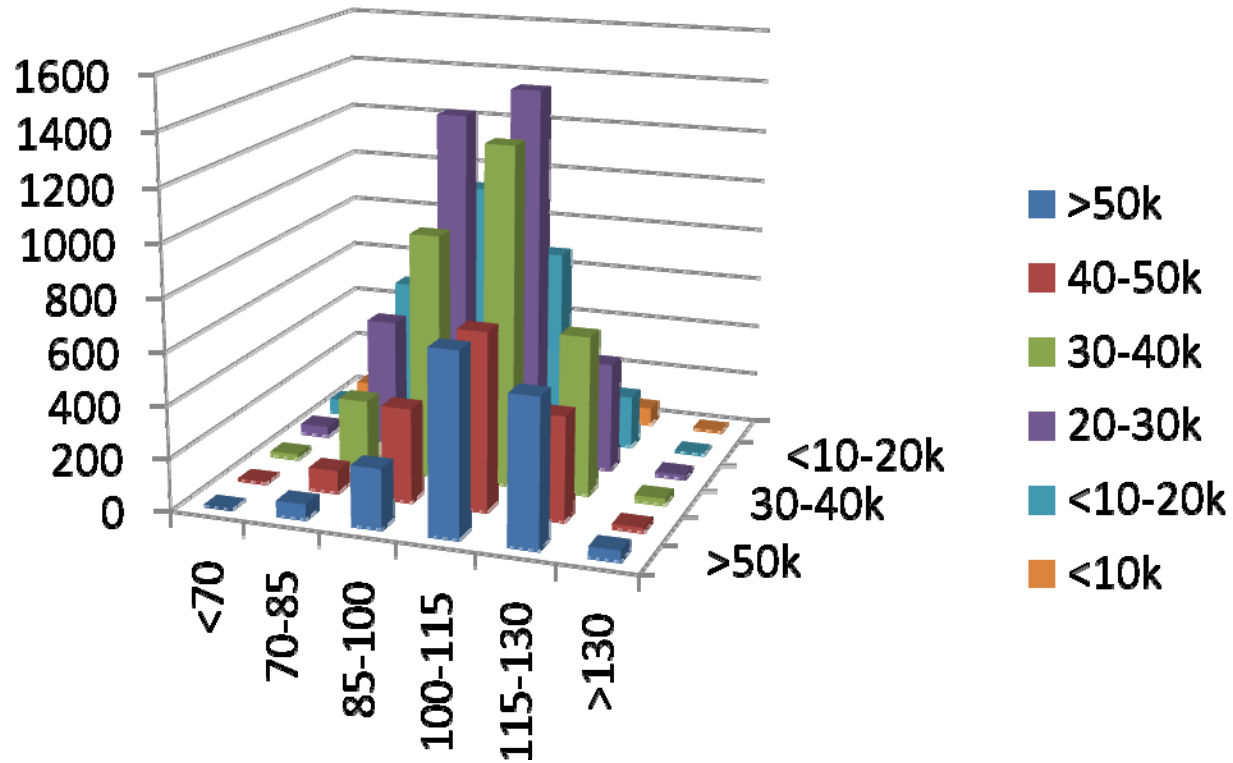
(Count of 19 items)



% Married Within Each g x Income Category



N of Men in Each $g \times$ Income Category



The Prediction?

1. Years of education and occupational prestige are mostly surrogates for g .
2. “Household income” captured something important and independent of g —but unclear what it represents (reverse causation possible, too)
3. g better than “household income” at predicting psychological problems (no reverse causation).
4. Psychological problems in 1985 does not predict mortality to 2000

Thank you.