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)

<table>
<thead>
<tr>
<th></th>
<th>$g$</th>
<th>PTSD symptoms (15)</th>
<th>Anxiety/depression (7)</th>
<th>Somatic (19)</th>
<th>Self-rated health</th>
<th>Married</th>
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<tbody>
<tr>
<td>$g$</td>
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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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<td>-0.21</td>
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<td>-0.05</td>
<td>0.26</td>
<td>0.30</td>
<td>-0.02</td>
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<tr>
<td>Income per capita</td>
<td>0.22</td>
<td>-0.10</td>
<td>-0.11</td>
<td>-0.01</td>
<td>0.13</td>
<td>-0.44</td>
<td>-0.01</td>
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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)

<table>
<thead>
<tr>
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<th>(1)</th>
<th>(2)</th>
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<th>(4)</th>
<th>(5)</th>
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<td>0.06</td>
<td>1.04</td>
<td>1.00</td>
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<tr>
<td>Somatic</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td>1.11</td>
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<tr>
<td>Worse health, self-rated</td>
<td></td>
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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

![Graph showing the gradients of effect sizes for 3 SES measures along the $g$ continuum. The x-axis represents 6 ranges of $g$ (in IQ metric) from <70 to >130, and the y-axis represents standardized mean differences.]
Gradients of “Effect Sizes” for 3 SES Measures—Along the $g$ Continuum
Gradients of “Effect Sizes” for $g$ and Other SES Measures—Along the Family-Income Continuum
Gradients of Psychological and Somatic Problems Along the \( g \) Continuum

The graph illustrates the standardized mean differences across different ranges of \( g \) values (in IQ metric), with the following categories:

- **Self-rated health**
- **15 PTSD symptoms**
- **7 Anx/depr**
- **19 Somatic**

The x-axis represents the 6 ranges of \( g \) values, and the y-axis represents the standardized mean differences.
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

![Graph showing standardized mean differences across different income ranges for various behaviors.](image-url)
And No Cirrhosis!
Odds Ratios for Other Chronic Diseases—Along the $g$ Continuum

The graph shows standardized mean differences for various outcomes across different ranges of $g$ (in IQ metric). The ranges are labeled as follows: 

- $<70$
- 70-85
- 85-100
- 100-115
- 115-130
- $>130$

The outcomes include:

- OR survival
- OR no diabetes
- OR no hypertension
- OR no cancer

The graph illustrates how odds ratios change across these ranges, with different markers and line styles for each outcome.
PTSD Symptoms
(Count of 15 items)
Anxiety-Depression

(Count of 7 items)
Somatic Problems
(Count of 19 items)
% Married Within Each $g \times$ Income Category

![Bar Chart]

- Blue: <10k
- Red: 10-20k
- Green: 20-30k
- Purple: #REF!
- Cyan: >50k
- Orange: 40-50k
- Light Blue: 30-40k

Categories:
- <70
- 70-85
- 85-100
- 100-115
- 115-130
- >130

Income Ranges:
- <10k
- 10-20k
- 20-30k
- >50k
- 40-50k
- 30-40k
N of Men in Each $g \times$ Income Category

![Bar chart showing the number of men in each $g \times$ income category. The x-axis represents different income categories (<70, 70-85, 85-100, 100-115, 115-130, >130), and the y-axis represents the number of men. The chart uses different colors to represent different income levels (<10k, <10-20k, 10-20k, <30k, 30-40k, >50k).]
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).
Thank you.