Social Inequality and Disparities in Health: Their Connections Over the Life Course

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Overview of Presentation

- Evidence for Social Inequality
- Evidence for Socioeconomic (SES) Disparities in Physical Health
- Challenges in Understanding How SES and Health are Linked Over the Life Course
- Psychological and Psychobiological Processes
- New Life Course Evidence
Gini Index 1913-1994
(From Plotnik, 1999)
U.S. Income Inequality
1967-2001

Coefficient of GINI

Year

Source: U.S. Census Bureau.

Income (in dollars 2001)
Lowest quintile
Highest quintile

Source: U.S. Census Bureau.
U.S. Income Inequality
1967-2001

Source: U.S. Census Bureau.
U.S. Income Inequality by Education
1963-2003

Figure 19: The top decile income share in France and in the U.S., 1913-1998

Source: Authors’ computations based on income tax returns (France: see Piketty (2001b, table A1, col. P90-100); U.S.: see this paper, table A1, col. P90-100)
Poor self-reported health by income 1975

Proportion Reporting Poor Health
By Quartiles of Income and Age Group, NHIS 1975

Source: NHIS, 1975.
Poor self-reported health by income 2000

Proportion Reporting Poor Health
By Quartile of Income and Age Group, NHIS 2000

Poor self-reported health by education 1975

Proportion Reporting Poor Health
By Education Level and Age Group, NHIS 1975

Source: NHIS, 1975.
Poor self-reported health by education 2000

Proportion Reporting Poor Health
By Education Level and Age Group, NHIS 2000

Life expectancy

At birth
- White female
- Black female
- White male
- Black male

At 65 years
- Black female
- White female
- White male
- Black male

Year:

Life expectancy in years:
0 10 20 30 40 50 60 70 80 90 100

SOURCES: Centers for Disease Control and Prevention, National Center for Health Statistics, Health, United States, 2007, Figure 18. Data from the National Vital Statistics System.
Percent of live births weight less 2,500 grams
By mother’s education

Source: CDC-NCHS-Division of Vital Statistics
Infant Mortality by Race (1950-2004)
Age mortality equivalence for high and low education

Source: NHIS-NDI (Projected to 2005)
Age mortality equivalence for high and low education

Source: NHIS-NDI (Projected to 2005)
Age mortality equivalence for high and low education

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Age mortality equivalence for high and low education

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Age mortality equivalence for high and low education

Source: NHIS-NDI (Projected to 2005)
Role of Developmental Science

- Largely absent from most studies of etiology of adult morbidity and morality
- Central focus on psychological trajectories and family functioning over time
Transactional Theory of Development

Genetics and Epigenetics

- Largely missing from literatures on social disparities and health over the lifecourse
- Naive views of the role of genes
- Genes are probabilistic, not deterministic
Genetics and Epigenetics

- Explosion in research opportunities
  - Twin registries
  - Embedded twin samples in population studies and large community studies
  - DNA in national samples and smaller studies
Genetics and Epigenetics

- Epigenetics is poised to move from animal to human models
  - Processes that modify gene expression
  - Environments cannot change DNA sequence but can influence DNA expression
Role of Psychological Factors in Health

Most health outcomes in large-scale demographic studies are:

- Morbidity
- Mortality
- Health Status (poor, fair, good)
Role of Psychological Factors in Health

- Psychiatric disorders have been largely ignored until recently
  - Dunedin Study is major exception
- Psychiatric disorders are linked to physical health problems
- 50% of U.S. adults experience a psychiatric disorder at some point
Role of Psychological Factors

What do we know about continuity in early childhood to adulthood?

- Intelligence
- Personality
- Social relations
Continuity in Intelligence

- Understand complex ideas
- Adapt effectively to the environment
- Engage in various forms of reasoning
- Overcome obstacles by taking thought

Source: Neisser et al., 1996
Continuity in Intelligence

- Widely measured by IQ tests
- Stability of IQ in childhood: .45
- Stability of IQ: Middle childhood to adulthood: .65 to .75
- High heritability (.65-.75) but also can be changed

Source: Neisser et al., 1996
Continuity in Personality

- Rough outline of human individuality
- Recognizable signature that a person tends to express across situations (but not all)
- Also over time (but not forever)

Source: McAdams & Pals, 2006
Continuity in Personality

- Begins in childhood with temperament
  - Easy-going
  - Undercontrolled
  - Shy/Inhibited
- These patterns map similar personality traits in adolescence and adulthood
- Correlation is moderate
Continuity in Social Relations

- Early family life is very influential
- Proximal environment
- Healthiest patterns involve:
  - Warmth
  - Responsiveness
  - Sensitivity to infant and child cues
  - Appropriate limit setting
Continuity in Social Relations

- Infants develop a sense of security, trust in others, efficacy, enthusiasm

- Social relationships within the family influence social relations outside the family
Risky Families Model

Stress-sensitive Physiological Responses

Chronic Social and Emotional Stress: Social Isolation, Interpersonal Conflict, Loss, Violence Exposure, Discrimination

Ongoing Supports/Buffers: Community and Family Supports Individual Coping Resources

Daily Social and Emotional Experiences, Daily Activities

Physiological Stress System Activity (and other stress responsive biological processes)

Disparities in: Emotional Health Physical Health Academic Outcomes

Malleability of Psychological Development in Early Childhood

- Developmental scientist have known for 30 years that the early years are a sensitive period.
- Responsive and stimulating environments in early childhood launch children on healthy psychological trajectories.
- New research buttresses and expands this knowledge.
Malleability of Psychological Development in Early Childhood

- Evidence from neuroscience and "brain architecture"
- Evidence from psychobiology and early stress reactivity
Malleability of Psychological Development in Early Childhood

- Adult outcomes of early childhood intervention programs
- Perry Preschool Project
- Abecedarian Study
Long term Effects of Model Programs

- Reductions in:
  - Placement in special education
  - High school drop-out
  - Teenage childbearing
  - Health problems
  - Criminal activity
Dunedin Study

- Population study of health and development
- Birth cohort, 1972-73
- 1,000 individuals interviewed and assessed at 3, 5, 7, 9, 11, 15, 18, 21, 26, and 32 years
- Hospital records obtained at birth
Dunedin Study

- Brings together strong theory and measurement from:
  - Developmental science
  - Psychiatry
  - Demography
  - Epidemiology
  - Medicine

- Key findings presented today by Andrea Danese
Three New Dunedin Lifecourse Studies

Illustrate the role of psychological factors in adult physical and psychiatric health

(1) Social isolation in childhood is linked to CVD risk at age 26


(2) Conduct disorder beginning in childhood is linked at age 32 with:

- Mental health disorders
- Multiple morbidities

Three New Dunedin Lifecourse Studies

(3) Low SES in childhood is linked at age 32 to:

- Higher likelihood of
  - Tobacco dependence
  - Drug and alcohol abuse
  - CVD risk

- But not to major depressive disorder or anxiety disorders
Three New Dunedin Lifecourse Studies

(3) Explanatory factors are:

- Parental health history
- Parents’ current health problems and behaviors
- Adolescent smoking, alcohol, and drug use
- Childhood BMI and IQ
- Childhood maltreatment
- Adult SES
A simple model

\[ S_x = S_x(s_o, H_{x-1}, S_{x-1}, E_{x-1}) \]
\[ H_x = H_x(h_o, S_{x-1}, H_{x-1}, I_{x-1}) \]
The model expanded

\[ S_x = \alpha x^o s + \beta x^o h + \gamma_1 E_1 + ... \gamma_{x-1} E_{x-1} + \phi S_{x-1} + \lambda_1 H_1 + ... \lambda_{x-1} H_{x-1} + \sum_{i=1}^{x-1} \rho_i \varphi_{x-i} + \varepsilon_x \]

\[ H_x = a x^o s + b x^o h + g_1 I_1 + ... g_{x-1} I_{x-1} + \mu H_{x-1} + l_{x-1} S_{x-1} + ... l_{x-1} S_{x-1} + \sum_{i=1}^{x-1} r_i v_{x-i} + e_x \]
A simplified model

\[ S_x = \alpha_x s_o + \beta_x h_o + \theta_1 S_{x-1} + \theta_2 H_{x-1} + \xi_1 \]

\[ H_x = a_x s_o + b_x h_o + \sigma_1 H_{x-1} + \sigma_2 S_{x-1} + \xi_2 \]
Figure 1. Path diagram of health and SES over the life cycle (see equation 1)
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Estimation and simulation

- Estimation of SEM

- Use estimated regression coefficients to simulate a life course

- Identify SES gradients:
  - Under observed conditions
  - When early health paths are eliminated
Decomposition of effects of parental social class on sons’ social class

- Education: 9%
- Cognitive: 51%
Decomposition of effects of parental social class on sons’ social class

- Wallet: 31%
- Cognitive: 51%
- Education: 9%
Decomposition of effects of parental social class on sons’ social class

- Education: 9%
- Cognitive: 51%
- Wallet (Direct): 31%
- Wallet (Direct) (Direct):
- Health (LBW):
- Health (Chronic):
- Cognitive:
- Education:
Decomposition of effects of parental social class on sons’ social class

- Education: 9%
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- Health (Chronic): 9%
- Cognitive: 51%
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Magnitude of selection effects

- Observed SES gradients is .30

- If early health effects are eliminated SES gradients descends to .24 or it accounts for about 1/5 of the total gradient

- We worry about things that contribute less, why shouldn’t we pay attention to this?
Relations between the three empirical regularities

- Aggregate Inequality
- Social Mobility
- Health Disparities
- Stress?
- Early Health?

- Assortative mating
- Differential fertility

Relations:
- \( \varepsilon \)
- \( \eta \)
- \( \gamma \)