Social Capital, Social Cohesion and Health.

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## Conceptual approaches to defining “social capital”

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Figure 1: Studies of Individual-Level Trust and Fair/Poor Self-Rated Health (Dichotomous)

Systematic Review of Studies, 1996-November 1, 2006

Source: Kim, Subramanian & Kawachi, 2008. Chapter 8
Contextual effect of area-level social capital?

Figure 2B: Studies of Area-Level Trust and Fair/Poor Self-Rated Health (Dichotomous) Without Adjustment for Individual-Level Social Capital

- Kawachi et al., 1999
- Subramanian et al., 2002
- Poortinga, 2006a
- Poortinga, 2006c
- Yip et al., in press

Odds Ratio and 95% Confidence Interval
...after adjustment for individual trust perceptions in multi-level analysis.

Figure 2A: Studies of Area-Level Trust and Fair/Poor Self-Rated Health (Dichotomous) With Adjustment for Individual-Level Social Capital
Figure 3: Studies of Individual-Level Associational Memberships and Fair/Poor Self-Rated Health (Dichotomous)

Source: Kim, Subramanian & Kawachi, 2008. Chapter 8
Figure 4A: Studies of Area-Level Associational Memberships and Fair/Poor Self-Rated Health (Dichotomous) With Adjustment for Individual-Level Social Capital

Poortinga, 2006a

Poortinga, 2006c

Yip et al., in press

Odds Ratio and 95% Confidence Interval
State of Empirical Evidence

- Most studies cross-sectional.

- Bulk of studies have focused on individual-level social capital (trust perceptions, associational membership).

- Mostly self-rated health.

- Contextual effects remain elusive.

Springer, 2008
Problems in Causal Inference

- Common method variance
- Omitted variable bias (e.g. disadvantaged early rearing environment resulting in poor attachment and poor health).
- Reverse causation (e.g. people participate because they are healthy).
Social Capital and Health
A Study of Adult Twins in the U.S.
Takeo Fujiwara, MD, PhD, MPH, Ichiro Kawachi, MD, PhD
Study Sample

- The National Survey of Midlife Development in the US (MIDUS) Twin study, 1995-1996 (open access)
- Eligibility: 25-74 years, non-institutionalized, living in the continental US, known zygosity, living together till 14 years.
- N=1,888 individuals, 944 twin pairs
Sample selection

- Twin screening for ~50,000 national representative sample
- 14.8% presence of twin
- 60% gave permission to access twin
- 26% completed interview (N=998 pairs)
- Exclude unknown zygosity and separated before 14 (N=54 pairs)
- Final study sample (N=944 pairs)
What do twin studies add?

- Control for inherited characteristics (e.g. temperament, personality, ability).
- Control for early rearing environment (e.g. poor attachment • poor social relations & poor health in adulthood)
Twin fixed-effects analysis

MZ twins

Twin A

\[ \text{Health}_A = \bullet_{1A} SC_A + \text{Gene}_A + \text{Early Env}_A \]

Twin B

\[ \text{Health}_B = \bullet_{1B} SC_B + \text{Gene}_B + \text{Early Env}_B \]

\[ \Delta \text{Health} = \bullet_{1A} \Delta SC \]
Twin fixed-effects analysis

DZ twins

Twin A

Health_A = •_1A SC_A + Gene_A + Early Env_A

Twin B

Health_B = •_1B SC_B + Gene_B + Early Env_B

\[ \triangle Health = •_1SC + \triangle Gene \]
Cognitive social capital

- Social trust: single item
  - “People in my neighborhood trust each other”
  - Responses: not at all, a little, some, and a lot.

- Sense of belonging: 3-item scale ($\alpha=0.73$)
  - “I don’t feel I belong to anything I’d call a community”
  - “I feel close to other people in my community”
  - “My community is a source of comfort”
  - Responded 7-point Likert scale.
SC measurement (mail questionnaire)

- **Structural social capital**
  - **Volunteer activity**
    - Sum of reported hours/month in volunteer work at health-related settings, school, political organizations, and/or any other local organizations or charity
    - Collapsed into 3 categories:
      - Don’t volunteer, 1-9 h/month, 10+ h/month.

- **Community participation**
  - Sum of reported frequency of participation/month in religious services, meetings of religious groups, unions, sports or social groups, or any other groups
  - Collapsed into 4 categories:
    - 0, 1-3 times/month, 4-7 times/month, 8+ times/month.
Outcome Assessment (telephone interview)

- Perceived physical health
  
  - “In general, would you say your physical health is...”
  
  Poor, Fair, Good, Very good, Excellent
Outcome Assessment (telephone interview)

- Perceived mental health
  - “How about your mental or emotional health?”
  - 5 point Likert scale

- Major depression by CIDI-SF (based on DSM-III-R)
  - Includes number of depressive symptoms
Fixed effects coefficients for self-rated physical health

MZ

DZ

*p<0.05

Social trust

Sense of belonging

Volunteer activity

Community participation
Fixed effects coefficients for self-rated mental health

MZ        DZ

-0.05 0 0.05 0.1 0.15 0.2

*p<0.05
*p=0.08

Social trust
Sense of belonging
Volunteer activity
Community participation
Fixed effects coefficients for depressive symptoms

-0.3
-0.25
-0.2
-0.15
-0.1
-0.05
0
0.05
0.1
0.15

MZ

DZ

Social trust
Sense of belonging
Volunteer activity
Community participation

*p<0.05
Fixed effects ORs for major depression

*All ORs are N.S.
Why social participation not associated with better health?

- **Reverse causation**
  - Adverse selection - People with health problems more likely to volunteer in groups such as self-help groups.

- **Dark side of social participation**
  - Social participation may not promote health if it imposes psychological burdens on participants (Ziersch & Baum, 2004).
Is social participation causally linked to improved health? Evidence from Japan

The Taketoyo Township Intervention Study.

- Population strategy: Opening of community senior centers, called “salons”.
- Managed by volunteers, not professionals.
- Programs are supported by the municipality through providing public venues, financial assistance, and advertisement to citizens etc.
- Not only physical exercise but also a variety of enjoyable social programs are provided.

Professor Katsunori KONDO, Nihon-Fukushi University & Dr. Yukinou ICHIDA.
But Does **X** really cause **Y**?

- **X**: Participation in salons
- **Y**: Good health
Alternative Hypothesis #1: Reverse causation.
(Good health allows you to participate.)

Salon participation $\leftrightarrow$ Good Health
- reverse
Alternative Hypothesis #2: Confounding Association may reflect the influence of omitted variables.

Salon participation $\rightarrow$ Good health

Congeniality, temperament, yada, yada.
Can we find an instrument?

Participation in salons

Good health

Congeniality, etc.
Can we find an instrument?

Distance to nearest salon

Participation in salons

Congeniality, etc.

Good health
Invaliding condition for an instrument

Distance to salon

Social participation

Direct path from Z to y?

Health

Unobserved confounders
Invaliding condition for an instrument

Distance to salon

Social participation

Health

Unobserved confounders

Path from Z to confounders?
Invalid instrument, III

Distance to salon

Social participation

Yada, yada

Common prior cause of both Z and y?

Good Health
2 Stage Least Squares (2SLS)

\[ \hat{X} = \alpha_0 + \alpha_1 Z + \alpha_k \text{ Other Predictors} \]

\[ Y = \beta_0 + \beta_1 \hat{X} + \beta_k \text{ Other Predictors} + \varepsilon \]
Findings in a Nutshell

• distance from salon = participation.
• participation (instrumented) = trust of others over 2-year follow-up period, adjusting for baseline trust.
• participation (instrumented) = self-rated health over 2-year follow-up period, adjusting for baseline health.

Professor Katsunori Kondo
Summary

- Participation looks bad for health in cross-sectional data if you fail to account for reverse causation and endogeneity.

- Better study designs needed – e.g. natural experiments, cluster randomized trials.