

The “Social Capital” concept in Social Epidemiology

Department Seminar
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(for WEB)

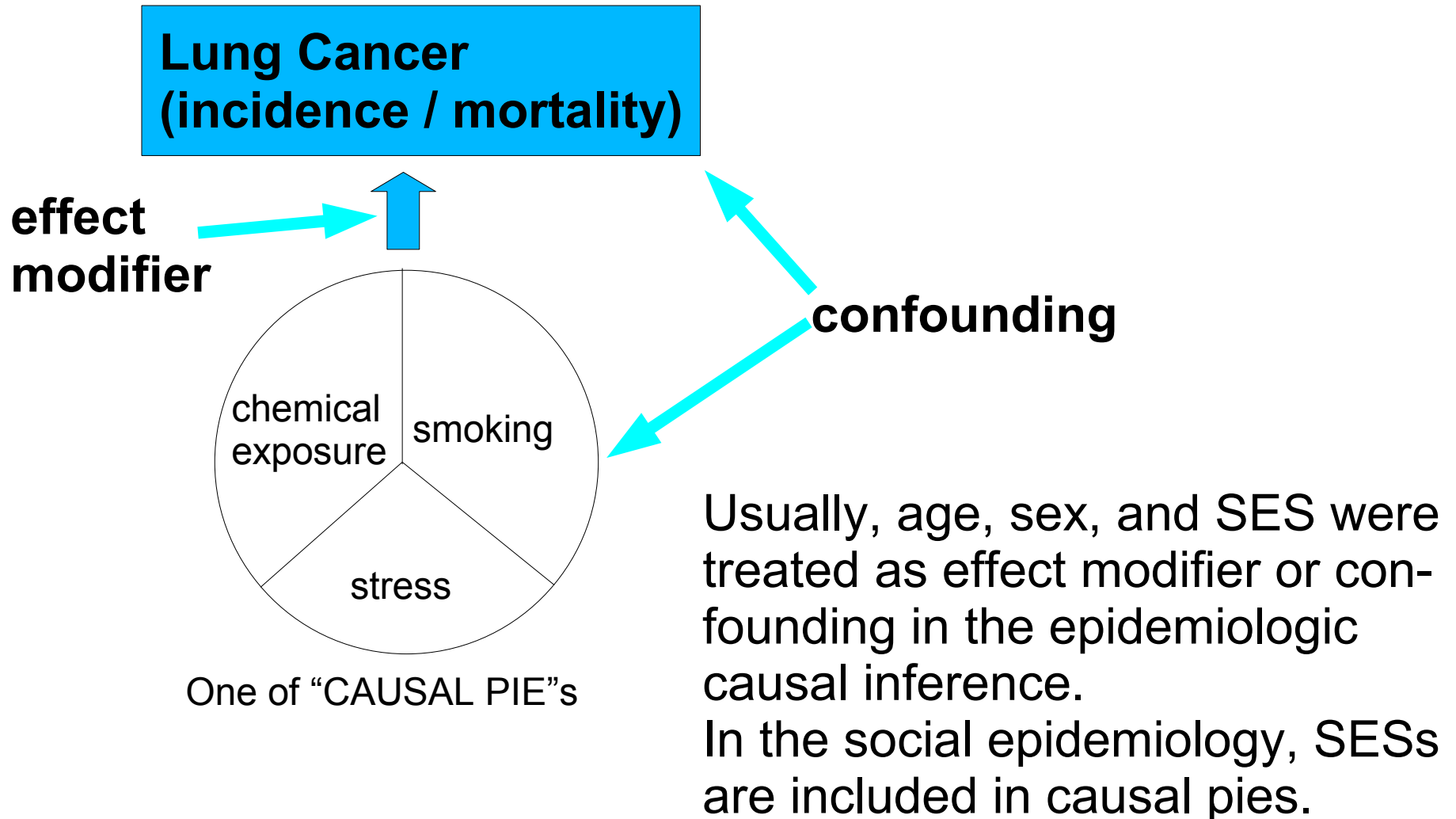
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Social Epidemiology

- Proposed by Lisa F. Berkman and Ichiro Kawachi (Harvard School of Public Health)
- Framework of “Modern Epidemiology”
 - Causal inference of disease
 - Sets of causal pies
 - Component causes → Disease
 - Usually, focused cause is controllable “exposure”
 - Socioeconomic factors (mostly population level) were to be controlled as confoundings or effect modifiers.
 - In “Social Epidemiology”:
 - Socioeconomic factors were focused as causes: in other words, “social determinants of health” is the target.

Epidemiologic causal inference

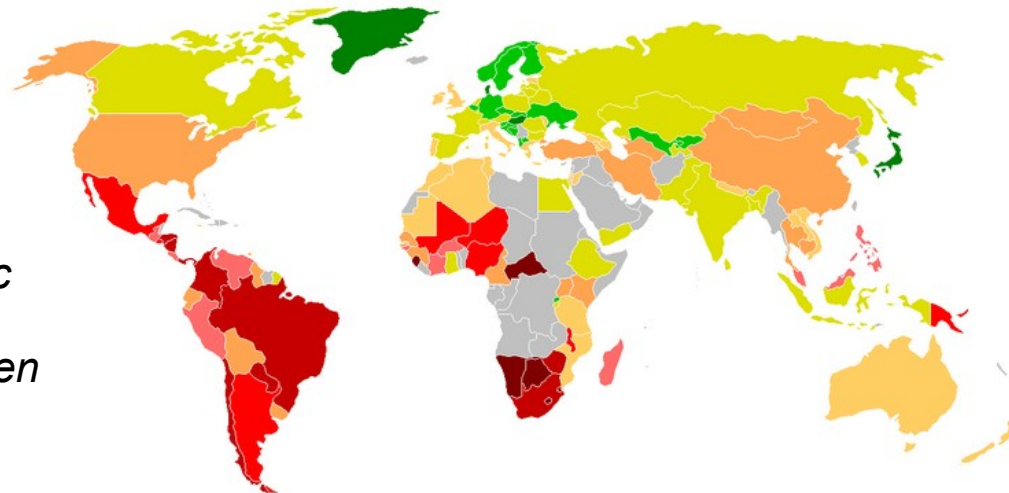


Social Capital

- Among socioeconomic factors...
 - micro (individual, family): income, education, etc.
 - meso: social capital (~ social integration), etc.
 - macro (population): population density, income inequality (measured as Gini coefficient) etc.
- Social capital: focused as a multi-level factor
 - Example: confiding relationships with neighbors, social network, reciprocity
 - Umbrella term: Social cohesion, social support, social integration and/or participation, among other social determinants of health (Almedom AM, 2005).

Gini coefficient for income inequality

- Let cumulative share of income earned (0~1) Y, and let cumulative share of people from lower income (0~1) X, plotting the relationship between X and Y makes Lorenz curve, where Lorenz curve matching Y=X means perfectly equal income.
- If the area between the line of perfect equality and Lorenz curve is A, and the area under the Lorenz curve is B, then the Gini coefficient is $A/(A+B)$, but usually by Brown (1994): $G = \text{abs}(1 - \sum((X[k+1]-X[k])(Y[k]+Y[k+1])))$.
- G=0 means perfect equality, G=1 means perfect inequality. G>0.4 is considered as inequal.



Color	Gini coefficient
Dark Green	< 0,25
Light Green	0,25 - 0,29
Yellow-Green	0,30 - 0,34
Yellow	0,35 - 0,39
Orange	0,40 - 0,44
Light Red	0,45 - 0,49
Red	0,50 - 0,54
Dark Red	0,55 - 0,59
Dark Red	> 0,60
Grey	NA

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Findings

- Durkheim E: “Depression and suicide are linked to the weakening of social bonds” (1897) based on the macro-level observation, “The lowest rates of suicide occurred in societies with the highest degrees of social integration”. (In: Kawachi I, Kennedy BP “The health of nations”, The New Press, 2002, pp.122)
- Spending time with our loved ones as well as being engaged in social activities are among the surest ways to prolong life and enhance the QOL (House JS, et al., 1988: cited in *ibid.*).
- Social isolated (network size measured by MSSSI ≤ 3) CAD patients are at elevated risk for mortality (Brummet BH, et al., 2001), where MSSSI is the abbreviation of Mannheim Social Support Interview and the network size is the total number of distinct individuals who are listed either of the following 6 types: (1) like to talk and do things with, (2) invited during last 4 weeks, (3) can borrow things from and ask favors of, (4) help them make a very important personal decision, (5) could talk with and who would understand if very close friend or relative was extremely ill or died, (6) would talk to, encourage, make them feel better about themselves when everything goes wrong and they feel down and discouraged and even doubt their own worth.

Some results from previous studies

Figure from Cohen S, et al. (1997)

Colds (infection and illness) % differed by Social Network Diversity (people having 1-3 social relationships [low] showed significantly higher percentage of illness than 4-5 [moderate] or 6- [high] people. (bar graph)

Cohen S, et al. (1997)

Figure 1 from Lochner KA, et al. (2003)

Predicted all-cause of death rates for persons 45-64 years by level of neighborhood per capita civic participation, adjusted for mean level of neighborhood deprivation, in 342 Chicago neighborhoods. (Line graphs by sex/ethnic groups; in any group, death rates tended downward with increasing neighborhood per capita civic participation)

Lochner KA, et al. (2003)

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Definitions of “social capital” summarized in Islam MK et al. 2006.

- Bourdieu P (1980) defined social capital as “the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition.”
- Coleman JS (1990) “consist of some aspect of social structure and they facilitate certain actions of individuals who are within the structure”
- Putnam RD et al. (1993) “refers to features of social organization, such as trust, norms and networks that can improve the efficiency of society by facilitating coordinated actions”
- Portes A (1998) “refers to the capacity of individuals to command scarce resources by virtue of their membership in networks or broader social structure”
- Four (partly overlapping) main theoretical ingredients: [1] social trust/reciprocity, [2] collective efficacy, [3] participation in voluntary organizations, [4] social integration for mutual benefit.

Biological background

- Social capital reduces psychological stress, subsequently strengthen immune system which keeps the individual healthy (the concept of psychosomatic medicine)
 - Cohen S, et al. (1997): Healthy volunteers were more susceptible to experimental rhinovirus infection when they have less social relationships (social relationships were measured by the cumulative number of individuals who are categorized in one of 12 types of social relationships and speak with the subject at least once within 2 weeks)

The way of social constructs influencing physical health (Cohen S, 2004)

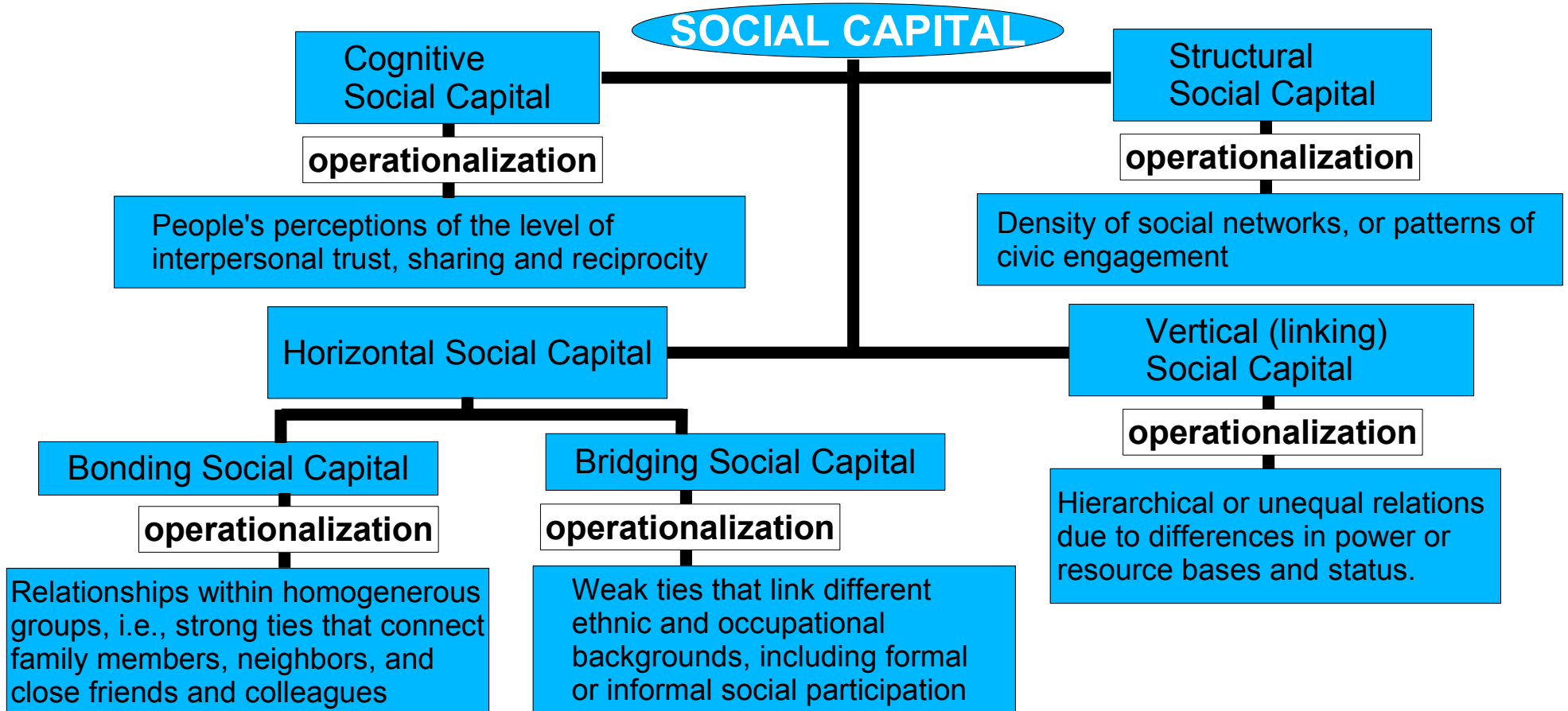
- Social support [stress buffering]: eliminates or reduces effects of stressful experiences by promoting less threatening interpretations of adverse events and effective coping strategies
- Social integration / Social capital [independent of stress]: promotes positive psychological states that include health-promoting physiological responses.
- Negative interactions [relationships as a source of stress]: elicits psychological stress and in turn behavior and physiological concomitants that increase risk for disease.

Figure 4 from Cohen S, 2004.

The figure showed % died from all causes by 4 levels of social connections, separately for males and females, where greater social integration (most connections) was associated with lower rates of mortality. Data obtained from 9 years follow-up survey.

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Framework for social capital study

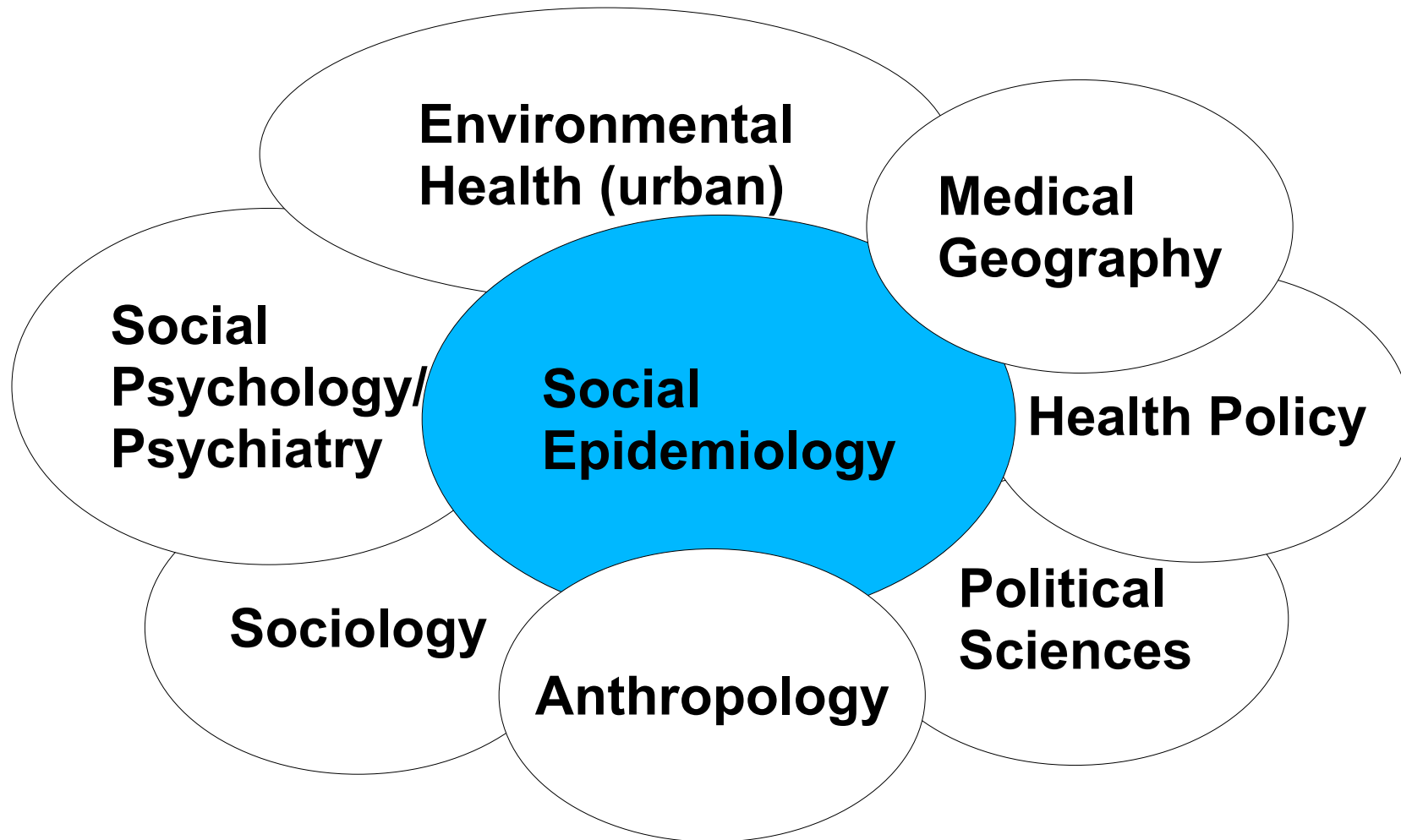


Source: Fig.1, Islam MK et al., 2006.

Components of “social capital” (in Islam MK et al., 2006)

- Cognitive: norms, values, attitudes, beliefs (i.e., perceptions of the level of interpersonal trust, sharing, and reciprocity)
- Structural: externally observable aspects of social organization (ex. density of social networks, patterns of civic engagement)
- Horizontal: ties existing among individuals or groups of equals or near-equals / “bonding” within homogeneous, “bridging” in heterogeneous groups.
- Vertical (Linking): stemming from hierarchical or unequal relations due to differences in power or resource bases and status.

Framework by Almedom AM (2005)



Measurement scales for social capitals (Almedom AM, 2005)

- Informal social control (ISC)
- Social cohesion and trust scales (SC&T)
- Neighborhood social capital scale (NSC)
- Kinship social support (KSS)
- Fear of calamity scale (FOC)
- Adapted social cohesion and trust scale (A-SCAT)
- Interviews with youth, teachers and parents;
Psychological sense of community (PSOC)
- Puttnam's community social capital benchmark survey

Examples of questions

- Lochner KA, et al. (2003): 3 indicators
 - resident's perceptions of reciprocity: The proportion of residents in each Neighborhood Cluster (NC) answering strongly agree/agree to the question that “people around here are willing to help their neighbors”
 - resident's perceptions of trust: The proportion of residents in each NC answering strongly agree/agree to the question that “people in this neighborhood can be trusted”
 - associational membership: variety of voluntary associations, incl. religious organizations, neighborhood associations, business or civic groups, neighborhood ethnic or nationality clubs, local/political organizations.

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