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# Building a Network Theory of Social Capital

**Nan Lin**

*Dept. of Sociology, Duke University*

## INTRODUCTION

In the past two decades, social capital in its various forms and contexts has emerged as one of the most salient concepts in social sciences. While much excitement has been generated, divergent views, perspectives, and expectations have also raised the serious question: is it a fad or does it have enduring qualities that will herald a new intellectual enterprise? This presentation's purpose is to review social capital as discussed in the literature, identify controversies and debates, consider some critical issues, and propose conceptual and research strategies in building a theory. I will argue that such a theory and the research enterprise must be based on the fundamental understanding that social capital is captured from embedded resources in social networks. Deviations from this understanding in conceptualization and measurement lead to confusion in analyzing causal mechanisms in the macro- and micro-processes. It is precisely these mechanisms and processes, essential for an interactive theory about structure and action, to which social capital promises to make contributions.

The paper will begin by exploring the nature of capital and various theories of capital, so that social capital can be properly perceived and located. It will then identify certain controversies which, unless clarified or resolved, will hinder the development of a theory and the research enterprise. By considering social capital as assets in networks, the paper will discuss some issues in conceptualizations, measurements, and causal mechanisms (the factors leading to inequality of social capital and the returns following investments in social capital). A proposed model will follow. The paper will conclude by calling attention to the rise of a new form of social capital, cybernetworks, and briefly suggesting how research on this topic promises to make important contributions to the research enterprise.

## WHAT IS CAPITAL?

The notion of capital can be traced to Marx (1833/1849; 1867, 1885, 1894; Brewer, 1984). In his conceptualization, capital is part of the surplus value captured by capitalists or the bourgeoisie, who control production means, in the circulations of commodities and monies between the production and consumption processes. In these circulations, laborers are paid for their labor (commodity) with a wage allowing them to purchase commodities (such as food, shelter, and clothing) to sustain their lives (exchange value). But the commodity processed and produced by the capitalists can be circulated to and sold in the consumption market at a higher price (user value). In this scheme of the capitalist society, capital represents two related but distinct elements. On the one hand, it is part of the *surplus value* generated and pocketed by the capitalists (and their "misers," presumably the traders and sellers). On the other hand, it represents an *investment* (in the production and circulation of commodities) on the part of the capitalists, with expected returns in a marketplace. Capital, as part of the surplus value, is a product of a process; whereas capital is also an investment process in which the surplus value is produced and

captured. It is also understood that the investment and its produced surplus value are in reference to a return/reproduction of the process of investment and of more surplus values. It is the dominant class that makes the investment and captures the surplus value. Thus, it is a theory based on the exploitative social relations between two classes. I call Marx's theory of capital the *classical theory of capital*.

Subsequent theoretical modifications and refinements have retained the basic elements of capital in the classical theory, as represented in Table 1. Fundamentally, capital remains a surplus value and represents an investment with expected returns. Human capital theory (Johnson, 1960; Schultz, 1961; Becker, 1964/1993), for example, also conceives capital as investment (e.g., in education) with certain expected returns (earnings). Individual workers invest in technical skills and knowledge so that they can negotiate with those in control of the production process (firms and their agents) for payment of their labor-skill. This payment has value that may be more than what the purchase of subsisting commodities would require and, thus, contain surplus values which in part can be spent for leisure and lifestyle needs and in part turned into capital. Likewise, cultural capital, as described by Bourdieu (Bourdieu, 1990; Bourdieu & Passeron, 1977), represents investments on the part of the dominant class in reproducing a set of symbols and meanings, which are misrecognized and internalized by the dominated class as their own. The investment, in this theory, is in the pedagogic actions of the reproduction process, such as education, the purpose of which is to indoctrinate the masses to internalize the values of these symbols and meanings. Cultural capital theory also acknowledges that the masses (the dominated class) can invest and acquire these symbols and meanings, even if they misrecognize them as their own. The inference is that while cultural capital is mostly captured by the dominant class through inter-generation transmissions, even the masses (or at least some of them) may generate returns from such investment and acquisition.

However, these theories break significantly from the classical theory. That is, because the laborers, workers or masses can now invest, and thus acquire certain capital of their own (be they skills and knowledge in the case of human capital, or "misrecognized" but nevertheless internalized symbols and meanings), they (or some of them) can now generate surplus values in trading their labor or work in the production and consumption markets. The social relations between classes (capitalists and non-capitalists) become blurred. The image of the social structure is modified from one of dichotomized antagonistic struggle to one of layered or stratified negotiating discourses. I call these the *neo-capitalist theories*. The distinctive feature of these theories resides in the potential investment and capture of surplus value by the laborers or masses. Social capital, I argue, is another form of the neo-capital theories.

Table 1. Theories of Capital

	The Classical Theory	The Neo-Capital Theories			
		Human Capital	Cultural Capital	Social Capital	
<b>Theorist</b>	Marx	Schultz, Becker	Bourdieu	Lin, Burt, Marsden, Flap, Coleman	Bourdieu, Coleman, Putnam
<b>Explanation</b>	Social relations: Exploitation by the capitalists (bourgeoisie) of the proletariat	Accumulation of surplus value by laborer	Reproduction of dominant symbols and meanings (values)	Access to and use of resources embedded in social networks	Solidarity and reproduction of group
<b>Capital</b>	A. Part of surplus value between the use value (in consumption market) and the exchange value (in production-labor market) of the commodity.  B. Investment in the production and circulation of commodities	Investment in technical skills and knowledge	Internalization or misrecognition of dominant values	Investment in social networks	Investment in mutual recognition and acknowledgment
<b>Level of</b>					

Analysis	Structural (classes)	Individual	Individual/class	Individual	Group/individual
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**WHY DOES SOCIAL CAPITAL WORK?**

The premise behind the notion of social capital is rather simple and straightforward: *investment in social relations with expected returns*. This general definition is consistent with various renditions by all scholars who have contributed to the discussion (Bourdieu, 1983/1986; Bourdieu, 1980; Burt, 1992; Coleman, 1988; Coleman, 1990; Erickson, 1995; Erickson, 1996; Flap, 1994; Flap, 1991; Lin, 1982; Lin, 1995; Portes, 1998; Putnam, 1993; Putnam, 1995a). Individuals engage in interactions and networking in order to produce profits. Generally, three explanations can be offered as to why embedded resources in social networks will enhance the outcomes of actions. For one, it facilitates the flow of *information*. In the usual imperfect market situations, social ties located in certain strategic locations and/or hierarchical positions (and thus better informed on market needs and demands) can provide an individual with useful information about opportunities and choices otherwise not available. Likewise, these ties (or their ties) may alert an organization (be it in the production or consumption market) and its agents, or even a community, about the availability and interest of an otherwise unrecognized individual. Such information would reduce the transaction cost for the organization to recruit "better" (be it skill, or technical or cultural knowledge) individuals and for individuals to find "better" organizations which can use their capital and provide appropriate rewards. Second, these social ties may exert *influence* on the agents (e.g., recruiters or supervisors of the organizations) who play a critical role in decisions (e.g., hiring or promotion) involving the actor. Some social ties, due to their strategic locations (e.g., structural holes) and positions (e.g., authority or supervisory capacities), also carry more valued resources and exercise greater power (e.g., greater asymmetry in dependence by these agents), in organizational agents' decision-making. Thus, "putting in a word" carries a certain weight in the decision-making process regarding an individual. Third, social tie resources, and their acknowledged relationships to the individual, may be conceived by the organization or its agents as certifications of the individual's *social credentials*, some of which reflect the individual's accessibility to resources through social networks and relations -- his/her social capital. "Standing behind" the individual by these ties reassures the organization (and its agents) that the individual can provide "added" resources beyond the individual's personal capital, some of which may be useful to the organization. Finally, social relations are expected to reinforce identity and recognition. Being assured and recognized of one's worthiness as an individual and a member of a social group sharing similar interests and resources not only provides emotional support but also public acknowledgment of one's claim to certain resources. These *reinforcements* are essential for the maintenance of mental health and the entitlement to resources. These four elements -- *information, influence, social credentials and reinforcement* -- may explain why social capital works in instrumental and expressive actions not accounted for by forms of personal capital such as economic capital or human capital.

**PERSPECTIVES AND CONTROVERSIES IN SOCIAL CAPITAL**

However, two perspectives can be identified relative to the level at which return or profit is conceived -- whether the profit is accrued for the group or for the individuals. In one perspective, the focus is on the use of social capital by individuals -- how individuals access and use resources embedded in social networks to gain returns in instrumental actions (e.g., finding better jobs) or preserve gains in expressive actions. Thus, at this relational level, social capital can be seen as similar to human capital in that it is assumed that such investments can be made by individuals with expected return, some benefit or profit, to the individual. Aggregation of individual returns also benefits the collective. Nonetheless, the focal

points for analysis in this perspective are (1) how individuals invest in social relations, and (2) how individuals capture the embedded resources in the relations to generate a return. Representative works (see review in Lin, 1999) can be found in Lin (Lin & Bian, 1991; Lin & Dumin, 1986; Lin, Ensel & Vaughn, 1981), Burt (1992;1998;1997), Marsden (Marsden & Hurlbert, 1988; Campbell, Marsden & Hurlbert, 1986), Flap (Boxman, De Graaf & Flap, 1991; De Graaf & Flap, 1988; Flap & De Graaf, 1988; Flap, 1991; Sprengers, Tazelaar & Flap, 1988; Volker & Flap, 1996), and Portes (Portes & Sensenbrenner, 1993) as well as in discussions of social capital by Coleman and Bourdieu.

Another perspective has its focus on social capital at the group level, with discussions dwelling on (1) how certain groups develop and maintain more or less social capital as a collective asset, and (2) how such a collective asset enhances group members' life chances. Bourdieu (1983/1986; 1980) and Coleman (1988; 1990) have discussed this perspective extensively and Putnam's empirical work (1993; 1995a) is exemplary. While acknowledging the essentiality of individuals interacting and networking in developing payoffs of social capital, the central interest of this perspective is to explore the elements and processes in the production and maintenance of the collective asset. For example, dense or closed networks are seen as the means by which collective capital can be maintained and reproduction of the group can be achieved. Another major interest is how norms and trust, as well as other properties (e.g., sanctions, authority) of a group, are essential in the production and maintenance of the collective asset.

Whether social capital is seen from the societal-group level or the relational level, all scholars remain committed to the view that it is the interacting members who make the maintenance and reproduction of this social asset possible. This consensual view puts social capital firmly in the neo-capital theory camp.

However, the divergence in analyzing social capital at different levels has created some theoretical and measurement confusions. Further confusion arises from the fact that some discussions have flowed freely between levels. For example, Bourdieu provides a structural view in pointing to the dominant class and nobility groups' reproduction as the principal explanation of social capital, which is represented by aggregating (1) the size of the group or network and (2) the volume of capital possessed by members (Bourdieu 1986, p. 248). This representation makes sense only when it is assumed that all members maintain strong and reciprocal relations (a completely dense or institutionalized network), so that strength of relations does not enter into the calculus. Yet, Bourdieu also describes how individuals interact and reinforce mutual recognition and acknowledgment as members of a network or group. Coleman (1990 Chapter 12), while emphasizing how individuals can use socio-structural resources in obtaining better outcomes in their (individual) actions, devotes much discussion to the collective nature of social capital in stressing trust, norms, sanctions, authority, and closure as part or forms of social capital. It is important to identify and sort through these confusions and reach some understandings before we can proceed to build a coherent theory of social capital. I identify some of these issues in Table 2.

Table 2. Controversies in Social Capital

Issue	Contention	Problem
Collective or individual asset (Coleman, Putnam)	Social capital as collective asset	Confounding with norms, trust
Closure or open networks (Bourdieu, Coleman, Putnam)	Group should be closed or dense	Vision of class society and absence of mobility
Functional (Coleman)	Social capital is indicated by its effect in particular action	Tautology (cause is determined by effect)

Measurement (Coleman)	Not quantifiable	Heuristic, not falsifiable
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One major controversy generated from macro- versus relational-level perspectives is whether social capital is collective goods or individual goods (see Portes' critique, 1998). Most scholars agree that it is both collective and individual goods; that is, institutionalized social relations with embedded resources are expected to be beneficial to both the collective and the individuals in the collective. At the group level, social capital represents some aggregation of valued resources (such as economic, political, cultural, or social, as in social connections) of members interactive as a network or networks. The difficulty arises when social capital is discussed as collective or even public goods, along with trust, norms, and other "collective" or public goods. What has resulted in the literature is that the terms have become alternative or substitutable terms or measurements. Divorced from its roots in individual interactions and networking, social capital becomes merely another trendy term to employ or deploy in the broad context of improving or building social integration and solidarity. In the following, I will argue that social capital, as a relational asset, must be distinguished from collective assets and goods such as culture, norms, trust, etc. Causal propositions may be formulated (e.g., that collective assets, such as trust, promote the relations and networks and enhances the utility of embedded resources, or vice versa), but it should not be assumed that they are all alternative forms of social capital or are defined by one another (e.g., trust is capital).

Another controversy, related to the focus on the collective aspect of social capital, is the assumed or expected requirement that there is closure or density in social relations and social networks (Bourdieu 1986; Coleman 1990; Putnam 1993, 1995). Bourdieu, from his class perspective, sees social capital as the investment of the members in the dominant class (as a group or network) engaging in mutual recognition and acknowledgment so as to maintain and reproduce group solidarity and preserve the group's dominant position. Membership in the group is based on a clear demarcation (e.g., nobility, title, family) excluding outsiders. Closure of the group and density within the group are required. Coleman, of course, does not assume such a class vision of society. Yet, he also sees network closure as a distinctive advantage of social capital, because it is closure that maintains and enhances trust, norms, authority, sanctions, etc. These solidifying forces may ensure that it is possible to mobilize network resources.

I believe that the requirement for network density or closure for the utility of social capital is not necessary or realistic. Research in social networks has stressed the importance of bridges in networks (Granovetter, 1973; Burt, 1992) in facilitating information and influence flows. To argue that closure or density is a requirement for social capital is to deny the significance of bridges, structural holes, or weaker ties. The root of preferring a dense or closed network lies, rather, in certain outcomes of interest (Lin, 1992a; Lin, 1986; Lin, 1990). For *preserving or maintaining resources* (i.e., expressive actions), denser networks may have a relative advantage. Thus, for the privileged class, it would be better to have a closed network so that the resources can be preserved and reproduced (e.g., Bourdieu 1986); or for a mother to move to a cohesive community so that her children's security and safety can be assured (Coleman 1990). On the other hand, for *searching and obtaining resources* not presently possessed (i.e., instrumental actions), such as looking for a job or better job (e.g., Lin; Marsden; Flap; Burt), accessing and extending bridges in the network should be more useful. Rather than making the assertion that closed or open networks are required, it would be theoretically more viable to (1) conceptualize for what outcomes and under what conditions a denser or more sparse network might generate a better return, and (2) postulate deduced hypotheses (e.g., a denser network would be more likely to promote the sharing of resources which, in turn, maintain group or individual resources; or, an open network would be more likely to access advantaged positions and resources, which in turn enhance the opportunity to obtain additional resources) for empirical examination.

A third controversy that requires clarification is Coleman's statement that social capital is any "social-

structural resource" that generates returns for an individual in a specific action. He remarks that "social capital is defined by its function" and "it is not a single entity, but a variety of different entities having two characteristics: They all consist of some aspect of a social structure, and they facilitate certain actions of individuals who are within the structure" (1990, p. 302). This "functional" view may implicate a tautology: social capital is identified when and if it works; the potential causal explanation of social capital can only be captured by its effect, or whether it is an investment depends on the return for a specific individual in a specific action. Thus, the cause factor is defined by the effect factor. Clearly, it would be impossible to build a theory where causal and effectual factors are folded into a singular function. This is not to deny that a functional relationship may be hypothesized (e.g., resources embedded in social networks enhance obtaining better jobs). But the two concepts must be treated as separate entities with independent measurements (e.g., social capital is the investment in social relations and better jobs are represented by occupational status or supervisory position). It would be incorrect to allow the outcome variables to dictate the specification of the causal variable (e.g., for actor X, kin ties are social capital because these ties channel X to get a better job, and for actor Y, kin ties are not social capital because these ties do not channel Y to get a better job). The hypothesized causal relationship may be conditioned by other factors (e.g., family characteristics may affect differential opportunities for building human and social capital) which need be specified in a more elaborate theory. A theory would lose parsimony quickly if the conditional factors become part of the definitions of the primary concepts. In fact, one would question whether it remains a theory if it is required to make a good prediction for every individual case and individual situation.

Perhaps related to this view of social capital as indistinguishable from its outcome -- and perhaps given his view that social capital, as collective good, can also be seen in many different forms such as trust, norms, sanctions, authority, etc. -- Coleman questions "whether social capital will come to be as useful a quantitative concept in social science as are the concepts of financial capital, physical capital, and human capital remains to be seen; its current value lies primarily in its usefulness for qualitative analyses of social systems and for those quantitative analyses that employ qualitative indicators" (1990, pp. 304-305). Again, the confusion can be seen as resulting from extending the notion of social capital beyond its theoretical roots in social relations and social networks and the unattainable theoretical position that prediction holds for every individual case. Once these issues are resolved, social capital should and must be measurable.

## CONCEPTUALIZING AND MEASURING SOCIAL CAPITAL

These debates and clarifications lead to the suggestion that social capital, as a concept, is rooted in social networks and social relations, and must be measured relative to its root. Therefore, social capital can be defined as *resources embedded in a social structure which are accessed and/or mobilized in purposive actions*. By this definition, the notion of social capital contains three ingredients: resources embedded in a social structure; accessibility to such social resources by individuals; and use or mobilization of such social resources by individuals in purposive actions. Thus conceived, social capital contains three elements intersecting structure and action: the structural (embeddedness), opportunity (accessibility) and action-oriented (use) aspects.

These elements have been mentioned by most scholars working on social capital. The social resources theory (Lin 1982) has specifically proposed that access to and use of social resources (resources embedded in social networks) can lead to better socioeconomic statuses. Further, the theory proposes that access to and use of social resources are in part determined by positions in the hierarchical structure (the strength of position proposition) and by the use of weaker ties (the strength of tie proposition). Bourdieu defines the volume of social capital as a function of the size of the network and the volume of

capital (economic, cultural and symbolic) possessed by networked individuals. Burt (1992) postulates that certain network positions (structural holes and structural constraints) have effects on individuals getting better positions or rewards in organizations. Flap (1995) defines social capital as a combination of network size, the relationship strength, and the resources possessed by those in the network. Portes (1998) also advocates focusing on social relations and networks in the analysis of social capital.

### **Embedded Resources and Network Locations**

Given the significance of resources and relations in social capital, it is not surprising that scholarly research has shown differential focus on one of the two elements. Some have chosen to focus on the locations of individuals in a network as the key to social capital. Burt's work (1990) typifies this approach. By identifying the locations of individual nodes, it is possible to assess how close or how far the node is from a strategic location, such as a bridge, where the occupant has the competitive advantage in possible access to more, diverse, and valued information. Strength of ties (Granovetter 1973, 1974) is also a well-known conceptually argued network location measurement of a bridge's usefulness. Other location measures are readily available in the literature, such as density, size, closeness, betweenness, and eigenvector (see review of such location measures in Borgatti, Jones and Everett (1998)). Implicit or explicit in this approach is the argument that network location is the key element of identifying social capital.

Another approach focuses on the embedded resources. In social resource theory, valued resources in most societies are represented by wealth, power and status (Lin 1982). Thus, social capital is analyzed by the amount or variety of such characteristics of others with whom an individual has direct or indirect ties. Measurement of social resources can be further specified as network resources and contact resources. Network resources refer to resources embedded in one's ego-networks, whereas contact resources refer to resources embedded in contacts used as helpers in an instrumental action, such as job searches. Thus, network resources represent accessible resources and contact resources represent mobilized resources in instrumental actions. For contact resources, the measurement is straightforward – the contact's wealth, power and/or status characteristics, typically reflected in the contact's occupation, authority position, industrial sector, or income.

There is little dispute that embedded resources are valid measures for social capital. There is some debate as to whether network locations are measures of social capital or precursors to social capital. My own view is that if it is assumed that social capital attempts to capture valued resources in social relations, network locations should facilitate, but not necessarily determine, access to better embedded resources. What types of network locations evoke resources in order to generate returns depend on the type of returns one expects. In the Modeling Section below, I will argue that two types of outcomes are possible as returns to social capital: instrumental and expressive. In instrumental actions, the return is the gaining of added resources, resources not presently possessed by ego — whereas in expressive actions, the return is the maintaining of possessed resources. For example, if we assume that bridges link to different information, the utility of that information depends on whether it concerns resources valued by the individual but not yet attained. If it does not, then the bridge serves little utility. If it does, the bridge is very useful. That is, not all bridges (or network locations) lead to better information, influence, social credentials or reinforcement. A bridge linking an individual looking for a job in a corporation to people occupying influential positions in large corporations will likely be of significantly more utility to that individual than from a bridge that leads to others who are members of a health club. On the other hand, a mother with young children would prefer to live in a dense, cohesive community rather than one with a mobile population and open access to the external world. Likewise, a person facing personal stresses such as divorce might benefit from access to and interaction with others who have had similar stress and understand its psychological effects, rather than someone who is happily married. These are expressive actions and we should expect the benefit of a dense network and homogenous partners.

These considerations would suggest that network locations should be treated as exogenous variables rather than endogenous variables of social capital itself. I will return to this topic in the Modeling section (pg. 39). Suffice it to conclude here that social capital is more than mere social relations and networks; it evokes the resources embedded and accessed. Nevertheless, such embedded resources cannot possibly be captured without identifying network characteristics and relations. Network locations are necessary conditions of embedded resources. In a given study, it is advisable to incorporate measures for both network locations and embedded resources.

**Measuring Social Capital as Assets in Networks**

Paralleling these two conceptual elements of social capital have been two principal approaches in measuring social capital as assets captured by individuals in social networks, as depicted in Table 3.

Table 3. Social Capital as Assets in Networks

Focus	Measurements	Indicators
Embedded resources	Network resources	Range of resources, best resources, variety of resources, composition (average resources), contact resources
	Contact statuses	Contacts' occupation, authority, sector
Network locations	Bridge to access to bridge	Structural hole, structural constraint
	Strength of tie	Network bridge, or intimacy, intensity, interaction & reciprocity

The first approach is to measure embedded resources. In this approach, resources embedded in the social networks are seen as social capital's core element. Thus, measurements focus on the valued resources (e.g., wealth, power, and status) of others accessed by individuals in their networks and ties. Such measurements can be made relative to two frameworks: (1) network resources and (2) contact resources. Network resources tap resources represented in the network an individual has access to. Typically, they include (1) the range of resources among ties (or the "distance" between the highest and lowest valued resources), (2) the best possible resources in the networks or among ties (or upper "reachability" in the resource hierarchy), (3) variety or heterogeneity of resources in the networks, and (4) composition of resources (average or typical resources). Research evidence is that these measures are highly correlated and tend to form a single factor, with the highest loading usually on the range of upper-reachability measures. Contact resources indicate the valued resources represented by contacts or helpers in specific actions. These measures, usually the valued resources (wealth, power, and status) of the contact(s), are applied in the context of specific actions, such as job searches. There is consistent and strong evidence that both network resources and contact resources positively affect the outcome of instrumental actions, such as job search and job advances (Lin 1999).

Another prevailing measurement strategy focuses on network locations as measurements of social capital. A major perspective is the argument that bridges or access to bridges facilitates returns in actions. Granovetter's notion of bridges as expressed in the strength of weak ties (1973) was a preview of this argument, which is elaborated and formalized by Burt in his notions of structural holes and constraints (1992). Other measures of bridges (e.g., betweenness) would also be candidates for social capital, even though they are used less in the social capital context.

There are many other measures such as size, density, cohesion, and closeness of social networks which



are candidates as measures for social capital. However, research evidence is much less clear as to their viability in a social capital theory. Unless clear theoretical arguments are presented along with the use of any specific measures, as both measures of social resources and network locations have been, it would be ill-advised to simply use any network measure as an indicator of social capital.

**Sampling Techniques**

Three sampling techniques have been employed to construct measures of social capital, as can be seen in Table 4. The saturation sampling technique is useful when it is possible to map a definable social network. In such networks, data from all nodes are gathered and their relationships identified, and measurements of network locations can be developed. The advantage of this technique is that it allows detailed and complete analyses of each and every network location as well as embedded resources in each node. Because of the requirement that the network has a defined and manageable boundary, it is a technique most useful for studies of social capital within an organization or a small network among organizations.

Table 4. Measurement Techniques

Technique	Advantages	Disadvantages
Saturation survey	Complete mapping of network	Limited to small networks
Name generator	Customized content areas Ego-centered network mapping	Lack of sampling frame Biased toward strong ties
Position generator	Content-free Sampling of hierarchical positions Multiple "resources" mapped Direct and indirect accesses	Lack of specificity of relations

For larger and less definable networks, ego-network sampling techniques are used. Typically, the name-generator technique (Laumann, 1966; Wellman, 1979; McCallister & Fischer, 1978; Burt, 1984; Marsden, 1987) is employed. This measurement technique elicits a list of ties from ego, and the relationships between them as well as among them are identified. From these data, locations of ego as well as these ties, relative to one another, can be computed. Network resources can also be obtained from the name-generator technique. Measures such as composition (typical resource characteristics), heterogeneity (diversity of resources), and upper reachability (best possible resources) can be computed. The advantages of this approach include (1) the identification of specific content areas, relative to actions under investigations, as naming items, and (2) the mapping of ego-network locations and characteristics as well as social resources embedded in the ego-network. The disadvantages include: (1) the lack of frames for sampling naming items, and (2) bias toward the inclusion of stronger ties.

The position-generator technique, a more recently developed technique (Lin and Dumin 1986), samples positions in a given hierarchy representative of resources valued in the collective (e.g., occupational status or prestige, authority positions, sectors, etc.). In this technique, a sample of positions with identified valued resources (occupational statuses, authority positions, industrial sectors, etc.) is used and the respondent is asked to indicate if she/he knows anyone having that job or position. From the responses, it then becomes possible to construct network resource indexes such as composition, heterogeneity, and upper reachability.

This technique has several advantages: (1) it can be based on a representative sample of positions meaningful in a given society, (2) it can directly or indirectly identify linkages to such resource

positions, and (3) it can be based on multiple resource criteria (e.g., occupation, authority, and industry). Studies in North America (Erickson, 1996), as well as Europe (e.g., Flap and Boxman in the Netherlands; Boxman, De Graaf & Flap, 1991; Volker and Flap in East Germany; Volker and Flap 1996; Angelusz and Tardos in Hungary; Angelusz & Tardos, 1991; Tardos, 1996) and Asia (e.g., Lin, Hsung and Fu in Taiwan; (Lin, Fu & Hsung, 1998) have proven the utility of this theoretically derived methodology in the context of social capital and instrumental action. It seems particularly useful if the valued resources are considered the core element of social capital. A sample of the position-generator instrument is presented in Table 5.

Table 5. Position Generator for Measuring Accessed Social Capital: An Example

Here is a list of jobs (show card). Would you please tell me if you happen to know someone (on a first-name basis) having each job?								
Job	1. Do you know anyone having this job?*	2. How long have you known this person? (# of years)	3. What is your relationship with this person?	4. How close are you with this person?	5. His/her gender.	6. His/her job.	7. Do you think you may find such a person through someone you know? (Person M)	8. Repeat #2-6 for Person M
Job A								
Job B								
Job C								
etc.								

\*If you know more than one person, think of the one person whom you have known the longest (or the person who comes to mind first)

### MODELING SOCIAL CAPITAL

To explicitly operationalize the critical elements, we may sharpen the definition of social capital as *investment in social relations by individuals through which they gain access to embedded resources to enhance expected returns of instrumental or expressive actions*. From this, three processes can be identified for modeling: (1) investment in social capital, (2) access to and mobilization of social capital, and (3) returns of social capital. While the above discussion clarifies social capital's definition, elements, and measurements, it is necessary to discuss briefly the types of outcomes which can be considered as expected returns. I propose two major types of outcomes: (1) returns to instrumental action, and (2) return to expressive action (Lin 1992a; Lin 1986; Lin 1990). Instrumental action is taken to obtain resources not possessed by the actor, whereas expressive action is taken to maintain resources already possessed by the actor.

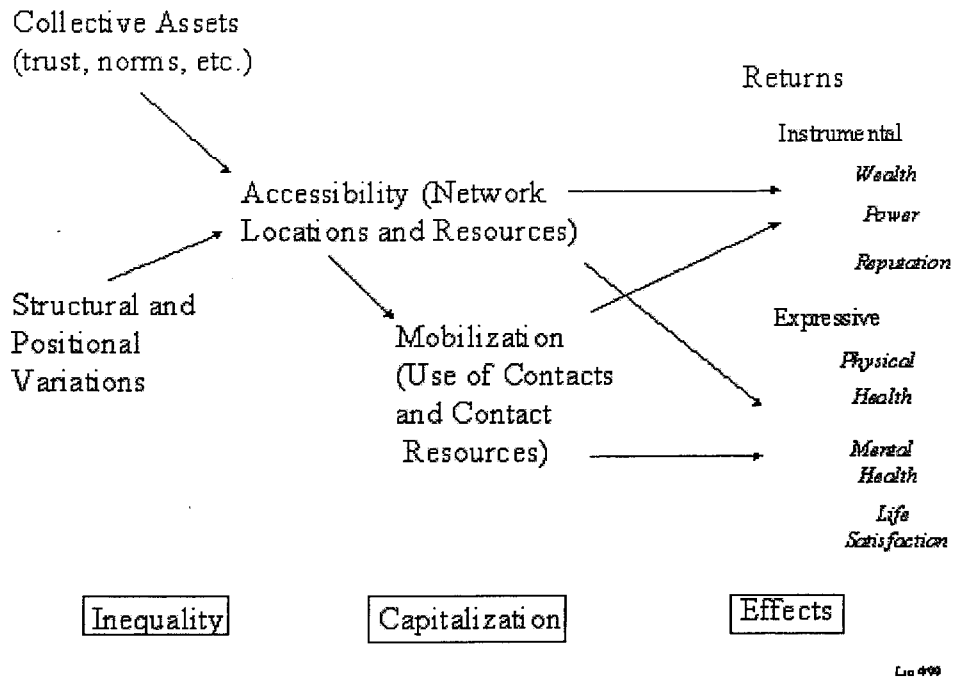
For instrumental action, we may identify three possible returns: economic return, political return, and social return. Each return can be seen as added capital. Economic return is straightforward. Political return is similarly straightforward, represented by hierarchical positions in a collective. Social gain needs some clarification. I have argued that reputation is an indication of social gain. Reputation can be defined as favorable/unfavorable opinions about an individual in a social network. A critical issue in social exchange where social capital is transacted is that the transaction may be asymmetric: a favor is given by the alter to ego. The ego's action is facilitated, but what is the gain for the alter, the giver of the favor? Unlike economic exchange, where reciprocal and symmetric transactions are expected in the

short or long term, social exchange may not entail such expectation. What is expected is that the ego and the alter both acknowledge the asymmetric transactions which create the former's social debt to the latter, who accrued social credit. Social debt must be publicly acknowledged in public for the ego to maintain his/her relationship with the alter. Public recognition in the network spreads the reputation of the alter. The greater the debt, the larger the network, and the stronger the need for the ego and the alter to maintain the relationship, the greater the propensity to spread the word in the network and, thus, the greater the reputation gained by the alter. In this process, the alter is gratified by the reputation, which, along with material resources (such as wealth) and hierarchical positions (such as power) constitutes one of the three returns fundamental in instrumental actions. I have discussed this issue elsewhere (Lin, 1998).

For expressive action, social capital is a means to consolidate resources and to defend against possible resource losses (Lin, 1986; Lin, 1990). The principle is to access and mobilize others who share interest and control of similar resources so that embedded resources can be pooled and shared in order to preserve and protect existing resources. In this process, alters are willing to share their resources with ego because the preservation of the ego and its resources enhances and reinforces the legitimacy of alters' claim to like resources. Three types of return may be specified: physical health, mental health, and life satisfaction. Physical health involves maintenance of physical functional competence and freedom from diseases and injuries. Mental health reflects capability to withstand stresses and maintenance of cognitive and emotional balance. Life satisfaction indicates optimism and satisfaction with various life domains such as family, marriage, work, and community and neighborhood environments.

Oftentimes, returns to instrumental actions and expressive actions reinforce each other. Physical health offers the capacity to handle the enduring work load and responsibility needed to attain economic, political, and social statuses. Likewise, economic, political or social statuses often offer resources to maintain physical health (exercises, diet, and health maintenance). Mental health and life satisfaction are likewise expected to have reciprocal effects with economic, political and social gains. However, factors leading to the instrumental and expressive returns are expected to show differential patterns. As mentioned earlier, it may well be that open networks and relations are more likely to enable access to and use of bridges to reach to resources lacking in one's social circle and to enhance one's chances of gaining resources/instrumental returns. On the other hand, a denser network with more intimate and reciprocal relations among members may increase the likelihood of mobilizing others with shared interests and resources to defend and protect existing resources/expressive returns. Further, exogenous factors such as community and institutional arrangements and prescriptive versus competitive incentives may differentially contribute to the density and openness of networks and relations and the success of instrumental or expressive actions.

Having discussed the core elements of social capital, clarified some of the measurement and sampling issues, identified the types of returns, and briefly postulated differential patterns of causal effects, I would like to propose a model as an initial step of theorizing social capital. As can be seen in Figure 1, the model contains three blocks of variables in causal sequences (see bottom of figure). One block represents pre-conditions and precursors of social capital: the factors in the social structure and each individual's position in the social structure which facilitate or constrain the investment of social capital. Another block represents social capital elements, and a third block represents possible returns for social capital.



The process leading from the first block to the second block describes the formation of inequality of social capital: what structural elements and positional elements in the structure affect opportunities to construct and maintain social capital. It delineates patterns of differential distributions for social resources that are embedded, accessed, or mobilized. It should further demonstrate that there are social forces that determine such differential distributions. Thus, it is incumbent on a theory of social capital to delineate the patterns and determinants of the three ingredients of social capital or *the inequality of social capital* as collective assets, accessible social resources, and mobilized social resources. Two types of causation forces are of special interest to scholars in the analysis of inequality of social capital: structural and positional variations. A structure may be characterized in many variations, such as diversity in culture and ideology, level of industrialization and technology, level of education, extent of physical and natural resources, economic productivity, etc. Within a structure, individuals may be described as occupying different positions in social, cultural, political, and economic strata. These variations may be hypothesized to affect the richness or poorness of various social ingredients.

Within the second block, there is a process linking two elements of social capital: access to social capital and use of social capital. The process linking the two elements represents the process of social capital mobilization. That is: given the unequal distributions of social capital how would an individual be enabled or disabled to mobilize such capital for specific actions? This is where the model, while recognizing structural contributions to social capital, as captured in the inequality process, also emphasizes possible choice action in mobilization.

Third, the theory needs to demonstrate that the three ingredients are inter-connected. Thus, it needs to propose a causal sequence in which embedded resources constrain and enable individual choices and actions. The general expectation is that the better the accessible embedded resources, the better embedded resources can and will be mobilized in purposive actions by an individual. The more intriguing question is why given the same level of accessible embedded resources, some individuals mobilize better resources than others in actions. One contingency may be the network location. One could hypothesize that being a bridge or being closer to a bridge might make a difference: those at or

near these locations are better able to mobilize embedded resources. Also, the cognitive recognition that there is a structural advantage of using better embedded resources may make a difference.

Finally, the process linking the second block (social capital) and the third block (outcomes) represents the process where social capital produces returns or yields. Here, the theory should demonstrate how social capital is capital, or how it generates return or gain. That is, it should propose how one or more of the elements of social capital directly or indirectly impact an individual's economic, political and social capital (resources) or her/his physical, mental and life well-beings.

These conceptualizations, as individual components and processes, are not new. Research on the social resources theory (Lin 1999) has verified the proposition that social resources or social capital enhances an individual's attained statuses such as occupational status, authority, and placement in certain industries. Through these attained positions, social capital enhances economic earnings as well. These relationships hold up after family background and education are taken into account. Burt (1997, 1998) and others (Podolny & Baron, 1997) have shown that advances and economic rewards are also enhanced in organizations for individuals at strategic locations in the informal networks. For those closer to structural holes or bridges, and, thus, less structural constraints, they seem to gain better returns, presumably because such locations give these individuals better opportunities to access certain capital in the organization. Research is progressing on how organizations use social capital in recruiting and retaining individuals. Fernandez and associates (Fernandez & Weinberg, 1997) have shown that referrals increase applications, recruit better qualified candidates, and reduce costs in the screening process.

In Putnam's studies (1993; 1995a; 1995b), this is indicated by participation in civic associations (e.g., churches, PTAs, Red Cross) and social groups (bowling leagues). Coleman (1990) provides examples of diffusion of information and mobilization through social circles among radical Korean students (i.e., network as capital), a mother moving from Detroit to Jerusalem in order to have her child walk to playground or school safely (norm as capital); and diamond traders in New York making trades through informal ties and informal agreements (network and trust as capital). Portes (1998) also specified "consummatory" and instrumental consequences of social capital (see Portes and Sensenbrenner 1993 for the consummatory consequences -- solidarity and reciprocal support -- of social capital for immigrant groups). The primary focus here is on the development, maintenance, or decline of collective assets.

At the meso-network level, the focus is shifted to how individuals have differential access to resources embedded in the collective. The question posed is, in a given collective, why certain individuals have better access to embedded resources than others. The nature of social networks and social ties becomes the focus of analysis. Granovetter (1973; 1974; 1982; 1985; 1995) proposes that bridges, as usually reflected in weaker ties, provide better access to information. Burt (1992; 1997; 1998) sees that strategic locations in the networks, structural holes or structural constraints, imply better or worse access to information, influence, or control. Lin (1982; 1990; 1994a; 1995; 1999) has suggested that hierarchical positions as well as network locations facilitate or hinder access to embedded resources. Embedded resources are indicated by the wealth, status, and power of social ties.

At the micro-action level, social capital is reflected in the actual linkage between the use of embedded resources in instrumental actions. For example, there is substantial literature on how informal sources and their resources (contact resources) are mobilized in job searches and their effects on attained socioeconomic statuses (Lin, Ensel & Vaughn, 1981; De Graaf & Flap, 1988; Marsden & Hurlbert, 1988).

Research has also been extensive in the area of expressive actions' returns. Much is known about the indirect effects of networks on mental health and life satisfaction (Lin 1986; House, et al. 1988;

Berkman & Syme 1979; Berkman 1984; Hall & Wellman 1985; Wellman 1981; Kadushin 1983). That is, network locations enhance the likelihood of accessing social support which, in turn, improves one's physical or mental well-being.

### **CYBERNETWORKS: THE RISE OF SOCIAL CAPITAL**

The final section will be devoted to a discussion of the phenomenon I call cybernetworks, defined as social networks in cyberspace. In 1997, U.S. consumers bought more computers than automobiles, according to Steven Landefeld, director of the Bureau of Economic Analysis (USA Today, March 17, 1999). Worldwide PC sales will overtake television sales in 2000, according to Paul Otellini of the Intel Architecture Business Group (Intel Developer Forum, February 25, 1999). In fact, PC sales already outnumbered sales of TV sets in 1998 in Australia, Canada, Denmark, and Korea. In 1999, 50 percent of U.S. households will have computers and 33 percent will be online (Bob Metcalfe, Info World, January 18, 1999, p. 90, quoting International Data Corp.)

E-commerce has become big business. In 1998 online shopping registered at \$13 billion (with an average order amount of \$55) and it is projected to reach \$30 to \$40 billion in 1999 (the Boston Consulting Group, as quoted in PC Magazine March 9, 1999, p. 9). Greatest growth is expected in travel (88% in 1999 over 1998), PC hardware (46%), books (75%), groceries (137%), music (108%), and videos (109%) (Jupiter Communication, as quoted in PC Magazine, March 9, 1999, p. 10). It has been estimated that 24 million U.S. adults plan to buy gifts online in 1999, or almost quadruple the 7.8 million who said they bought gifts online in 1998; online holiday shopping alone in 1999 could exceed \$13 billion (International Communications Research, as quoted in PC Week, March 1, 1999, p. 6). During 1999, Internet commerce, which is growing 30 times faster than most world economies, will reach \$68 billion (Bob Metcalfe, Info World, January 18, 1999, p. 90, quoting International Data Corp.). By year 2002, the projection is that online shopping will account for \$32 billion for convenience items such as books and flowers, \$56 billion for researched purchases like travel and computers, and \$19 billion for replenishment goods such as groceries (Forrester Research Inc., as quoted in PC Week, January 4, 1999, p. 25). Another projection suggests that 40 percent of Web users will be online buyers by 2002, resulting in \$400 billion of e-commerce transactions (International Data Corporation, as quoted in ZDNet Radar, Jesse Berst, "Technology of Tomorrow", January 6, 1999). In the first half of 1998, one out of every five retail stock trades occurred online. There are now an estimated 4.3 million people shopping for stocks and funds online, and online trading is expected to reach 31 percent of the total U.S. investment market by 2003 (Piper Jaffray, March 1999 PC Computing? P. 14).

On March 16, 1999, the US Commerce Department scrapped a 60-year-old industry classification system which had little relevance to an information-based economy (USA Today, March 17, 1999). For example, computers were not even an industry category; they were grouped with adding machines. Thus, a new system was installed which better reflected categories brought about by the information revolution. The system is also designed to be similar to those in Mexico and Canada as trade with those countries continues to grow (USA Today, March 17, 1999). Further, the US Commerce Department will begin publishing figures that show the impact of online shopping on retail activity, a key indicator of the nation's economic health. Until now the Department has lumped online shopping figures together with catalogue sales in its overall retail sales numbers. New figures that break out Internet sales as a separate entity will be available by the middle of 2000 for 1998 and 1999 (Info World, February 15, 1999, p. 71).

The growth of the Internet in the past few years has been nothing short of phenomenal. In 1995, 14.1 million of 32 million U.S. households had modems and in January 1999, 37.7 million of 50 million U.S. households had modems (USA Today, March 17, 1999, p. 9D). Worldwide, there were 68.7 million web users in 1997, 97.3 million in 1998, and the projection is that the number of web users will grow at a compound annual growth rate of 26 percent, reaching 227 million by 2001 (IDC, as quoted in PC

Magazine, February 9, 1999, p. 10). During 1999, the number of Internet users will surge by 28 percent to 147 million. Two-thirds of the people who will be online by 2002 are not online in early 1999 (Bob Metcalfe, Info World, January 18, 1999, p. 90, quoting International Data Corp.). At the end of 1997, only about 4,000 hotel rooms around the world offered Internet access, but the prediction is that by 2002 about four million hotel rooms in the United States alone will be online (Jupiter Communications, quoted in PC Computing, February, 1999, p. 14). Currently, over 90 percent of hotel Internet users used the accesses for e-mail, 60 percent for Web surfing, 50 percent for directions and maps, and close to 40 percent for faxing. Although business travelers are most likely to take advantage of this service, about 32 percent of these hotel guests surf the Web for entertainment purposes.

More than 45 million PC's in the US accessed the Internet regularly in early 1998, a 43 percent increase in the first quarter of 1998 versus the first quarter of 1997. Nearly 49 percent of all U.S. households had at least one personal computer (ZD Market Intelligence, January, 1999). This year, for the first time, most users -- 51 percent- - will live outside the United States ((Bob Metcalfe, Info World, January 18, 1999, p. 90, quoting International Data Corp.) The number of Internet users in China surged to 1.5 million in 1998, from 600,000 in 1997 (Xinhua News Agency, January 15, 1999). U.S. Internet guru Nicholas Negroponte predicted in January 1999 that the number of Internet users in China will balloon to 10 million by the year 2000 (Reuters, January 15, 1999).

Female participation on the net has increased dramatically. In January 1996, only 18 percent of net users aged 18+ were females; by January 1999, fully 50 percent of the users were females (USA Today, March 17, 1999, p. 9D). By the end of the year, it is expected that women will become the majority of users on the Internet (Bob Metcalfe, Info World, January 18, 1999, p. 90, quoting International Data Corp.). In 1997, more e-mail was sent than letters via the post office for the first time.

Personal computer experts have announced, without surprise to anyone, that the Internet is changing everything. Michael J. Miller, Editor-in-chief of PC Magazine wrote in February 1999 (PC Magazine, February 2, 1999, p. 4) that the Internet changes "the ways we communicate, get information, entertain ourselves, and run our businesses." In January 1999, Paul Somerson stated the same in PC Computing. It is practically impossible to get a credible estimate of how many discussion groups, forums, and clubs of multitude types have been formed and are continually being formed. What is the implication of cyberspace and cyber-network growth for the studies of social networks and social capital? The short answer is: incredible.

Take two important theoretical debates: the decline of social capital and the class-domination of globalization. The decline of social capital, a thesis based on enormous empirical work conducted by Putnam and others (Putnam, 1995a; Putnam, 1995b) is that social capital has been in the decline in the United States for the past three to four decades. As mentioned earlier, Putnam defined social capital, at least in the context of democratic societies, as civic engagements, or social relations that sustain and promote voluntary associations and groups. By examining many time-series data sets to trace the patterns of participation in relationally based associations and groups such as bowling leagues and PTAs, he concluded that for the past thirty to forty years, social capital has been on the decline in the United States.

There are a number of conceptual (tautological) and measurement (what associations are relational) flaws one can find in this research program. In view of the dramatic growth of cyber-networks, a fundamental question can be raised: do cyber-networks carry social capital? If so, there is strong evidence that the declining thesis is false. I suggest that indeed we are witnessing a *revolutionary rise of social capital*, as represented by cyber-networks. In fact, we are witnessing a new era where social capital will soon supercede personal capital in significance and effect.

Just as pertinent is the debate on whether globalization represents a reproduction of the world system where the core states continue to dominate and indeed "colonize" peripheral states by the incorporation of the latter into global economic systems dominated by the former (Sassen & Appiah, 1998; Browne & Fishwick, 1998; Brecher & Costello, 1998). This argument is supported by evidence that international organizations, international corporations, and international economic forms, such as commodity chains, are dominated by the values, culture, and authority of dominant states' corporations or these states themselves. Yet, cyber-networks suggest the possibility of a bottom-up globalization process where entrepreneurs and group formations become viable without the dominance of any class of actors (Wellman, 1998). Do cyber-networks suggest a neo-globalization process? I argue that, while not denying that the dominant states and actors remain actively interested in controlling the development of cyberspace, cyber-networks represent a new era of democratic and entrepreneur networks and relations where resources flow and are shared by a large number of participants with new rules and practices, many of which are devoid of colonial intent or capability.

With the increasing availability of inexpensive computers and ever-increasing web capabilities which transcend space and time, we are facing a new era of social networks in the form of global villages. Globalization is no longer necessarily a reproduction of the core-peripheral world system where the core states establish links and networks to the peripheral states for their continuing domination of information, resources, and surplus values. Instead, information is freer and more available to more individuals than ever before in human history. While access to computers and Internet remains distributed unequally and under varying dictatorial control, it is nevertheless clear that such constraints and control are waning fast as inexpensive computers and access to the Internet become available and at minimal cost, and technology leapfrogs the traditional authoritarian control of access to information and resources. There is strong evidence that an increasing number of individuals are engaged in this new form of social networks and social relations, and there is little doubt that a significant part of the activities involve the creation and use of social capital. Access to free sources of information, data, and other individuals create social capital at unprecedented pace and ever-extending networks. Networks are expansive and yet at the same time "intimate." Networking transcends time (connecting whenever one can and wants to) and space (accessing to sites around the globe directly or indirectly if direct access is denied). Rules and practices are being formulated as such networks are being built and constructed. Institutions -- borrowed from past practices, deliberately deviating from past practices, or consensually arrived at by participants -- are being created as such networks (e.g., villages) are being built.

There is little doubt that the hypothesis that social capital is declining can be refuted if one goes beyond the traditional interpersonal networks and analyzes the cyber-networks as they have emerged in the 1990s. Indeed, we are witnessing the beginning of a new era where social capital far outpaces personal capital in significance and effect. We need to compile basic data and information on the extent to which individuals are spending time and effort engaging others over cyber-networks, as compared to the use of time and effort for interpersonal communications, other leisure activities (TV watching, travel, eating out, movie- and theater-going), attending civic and local meetings, etc. We need to estimate the amount of useful information gathered through cyber-networks as compared to traditional media.

What kind of research agenda should we consider in view of the emerging cyber-networks in the coming millennium? I propose the following topics:

(1) Emergence and development of cybernetworks and villages: the formation and development of social groups and social organizations (the villages). We need data on cyber-networks as global villages - how each village is being constructed and rules and practices routinized, especially (a) how each group and territory is defined or undefined (closure versus openness), (b) how membership is claimed, defined, or acknowledged (ie., residents and citizens); (c) how the members are composed (e.g., demographics: individuals, households, and clusters; age, gender, ethnicity, linguistics, socioeconomic



assets); and (d) how resources are distributed within a village and across villages: class and inequality among villages.

(2) Organizations and patterns of networking: the development and implementation of networking and network locations. For example, it would be useful to study: (a) patterns of interactions and exchanges, (b) size, density, and heterogeneity of participants, and (c) network locations of various actors and their resources (see next topic).

(3) Socio-economic characteristics of participants: the potential social capital. It would be necessary to explore what resources the various actors bring to bear. These resources, including social relations and networks, would possibly account for (a) unequal opportunities to network locations, and (b) unequal access to embedded resources in each village.

(4) Globalization and localization: the formation and development of linkages across villages as social capital is extended beyond each group-village. These linkages further explore whether classes of villages are being formed. These structural and dynamic elements of networks further expand differential access to social capital. Important issues also include whether and how villages can develop and maintain domination-subordination relations and exchanges and what mechanisms would account for the functioning or not functioning of such relations (e.g., gender, age, ethnicity, and linguistic imperialism, technical skills and requirement, etc.), and the consequences of these relations on relative accessibility to social capital.

(5) War and peace in the global village - or competition and coordination among villages. Inevitably there will be tensions, conflicts, violence, competition, and coordination issues among villages. How do villages claim "self-defense" or "self-interest" and invade other villages for resources? How do villages become imperial or colonial powers? How do villages defend themselves and form coalitions? Would a "united nations" emerge and under what rules and practices? Would such a global body be dominated by the core villages? Thus, cyber-networks serve as vehicles to examine society as it emerges in real time. They are also analyzed as counter-evidence to the proclaimed demise or decline of the global village and social capital.

(6) Technology, commerce, and the global village. With the increasing development of technology and the ever-presence of commercial interests, cyber-networks fuse socio-economic-technological elements in social relations and social capital. This new feature of mixed economic and social capital poses new questions regarding the access and use of social capital. As technology has already made it possible to actualize the "virtual" reality (e.g., audio-visual, 3-D, touch-sensitive) and to transcend time and space (wireless and inexpensive equipment, for example) such that love, passion, as well as hatred and murder are being "real-ized" and personalized — for example, Internet romances and murders have occurred (Washington Post, March 6, 1999, p. A2); decency and free speech are clashing (Time, February 15, 1999, p. 52); personal data and history are becoming increasingly public (USA Today, January 18, 1999, p. 3B); Yugoslav sites used e-mails to engage "cyberwar" during the Kosovo conflict (Wall Street Journal, April 8, 1999). Is it possible that cyber-networks might break the dominance of elite classes and differential utility in social capital? Yet, technology requires resources and skills. While the globalization process is underway, there might be a trend for cyber-networks to exclude many underdeveloped societies and disadvantaged members of many societies. Thus, would these developments further unequalize the distribution of social capital? And under what conditions? Would these developments further segregate the world into the haves and the have-nots? Analyses must evaluate these questions relative to the different aspects of social capital (information, influence, social credentials, and reinforcement) and different outcomes (instrumental and expressive).

I suspect that the entire spectrum of the development and utility of all forms of capital can be examined

on cyber-networks, which fundamentally is relations and embedded resources — a form of social capital. In short, then, much work is urgently needed to understand how cyber-networks build and segment social capital. The above-mentioned topics will provide some of the data for scholars to understand new institutions and cultures as they emerge and the interactions between human and social capital. Most importantly, I suggest that they will provide clues as to whether and how social capital may be outpacing personal capital in significance and effect, and civil society, instead of dying, may be becoming expansive and global.

## CONCLUDING REMARKS

Social networks scholarship has much to say and to do about the development and future of social capital. Without anchoring the concept in social networks and embedded resources, chances are that social capital would fade away as an intellectual enterprise for the ever —broadening and —confounding definitions and almost utopian expectations of its practical applications. With ever sharpening definitions and measurements, social network scholarship may have much to contribute to the sustained development of social capital as an intellectual enterprise. As cyber-networks emerge as a major source of social capital, a new era is dawning and providing opportunities as well as challenges for theoretical development and practical analysis -- an era exciting and yet daunting for social networks scholars everywhere.

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