

Foundations of Social Capital

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Introduction

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1. The Rapid Growth of Social Capital Literature

Few social scientific concepts have gathered so much attention and so many followers in such a short period of time than the concept of social capital. As the articles collected in the current volume show, the fundamental idea can be traced back at least to de Tocqueville ([1840] 1945, Chapter 1 in this volume). Hanifan (1920, Chapter 2 in this volume), Jacobs (1961, Chapter 4 in this volume), Loury (1977), and Bourdieu (1986) used the term social capital to express ideas that foretold the current meaning of the term. Schultz (1961, Chapter 3 in this volume) and Becker (1962, 1964), among other economists, articulated theories of human capital in the 1960s, paving the way to a broader understanding of 'capital'. Granovetter's (1973, Chapter 5 in this volume) seminal study of social networks is three decades old and still has an enormous influence on contemporary thinking about social capital.

It was less than one and a half decades ago, however, that James S. Coleman (1988, Chapter 8 in this volume) carried out the first systematic conceptualization of the concept of social capital. Social capital has slowly gained recognition and important theoretical developments have been made (for example, Burt, 1992, Chapter 10; E. Ostrom, 1992, Chapter 12 - both in this volume). The publication of Robert Putnam and colleagues' celebrated *Making Democracy Work* in 1993 finally unleashed social capital research into its current widespread and lively phase of development.

Prior to 1990, there were only two citations listed on the Web of Science index for the twentieth century. The growth of interest in this subject is reflected in Table 1. The number of citations to articles and books overtly using the concept of social capital has escalated from two citations in 1991 to 220 citations in 2001.

Today, we encounter social capital in every corner of the social sciences. Armed with the concept of social capital, researchers tackle a wide variety of questions including: the resurgence of the US economy during the late 20th century (Fountain, 1997), East Berlin youths' participation in right-wing extremism (Hagan, Merkens, and Boehnke, 1995), the relationship between personal networks and political participation (Lake and Huckfeldt, 1998), the failure of past developmental policies (E. Ostrom, 1999), the difference in the industrial structures of the capitalist economies (Fukuyama, 1995, Chapter 17 in this volume), the poor performance of the African economies (Collier and Gunning, 1999, Chapter 19 in this volume), the effectiveness of institutions managing common-pool resources (Anderson, Locker, and Nugent, 2003; Birner and Wittmer, 2003), and the impact of active team-sport programs to offset the higher potential for student disturbances in large urban schools (Langbein and Bess, forthcoming).

Table 1 Citations in Web of Science on Social Capital*

Year	Number of Citations
1991	2

1992	3
1993	15
1994	12
1995	27
1996	37
1997	61
1998	102
1999	127
2000	150
2001	220

* Includes Science Citation, Social Science Citation, and Humanities Indexes.

Thanks to Charlotte Hess for doing this search.

What explains this rapid growth of the social capital literature? The 'standard' approaches to the problems of economic development and political order seem to have reached their limits. Abundant anomalies accumulated that called for careful examination of the factors that were left out of earlier theories. Some of the puzzles, especially the differential political and economic performance across nations and communities, could not be answered satisfactorily without seriously studying the omitted factors: trust and norms of reciprocity, networks and forms of civic engagement, and both formal and informal institutions.

The social capital approach takes these factors seriously as causes of behavior and collective social outcomes. The social capital approach does this in ways that are consistent with continued and lively usage of the neo-classical economics and rational choice approaches. In sum, the social capital approach improves the knowledge of macro political and economic phenomena by expanding the factors to be incorporated in such knowledge and by enabling scholars to construct richer causality among those factors, and by achieving these without dismissing the insights from neo-classical economics and rational choice theories that are essential to studying micro foundations of macro phenomena.

Abundant, and often valid, criticisms of the concept have also been levied against it (Arrow, 1999; Durlauf, 2002; Fine, 2001; Solow, 1999 - to name a few). Solow notes that despite the importance and relevance of the underlying ideas that the proponents of social capital try to convey, the majority of the current social capital research is plagued by 'vague ideas' and 'casual empiricism'. Academic research can be afflicted by fads and fashions just as much as any other field. We believe that the concept of social capital should take its place alongside physical and human capital as core concepts of great usefulness to the social sciences. Thus, this volume is not an effort to piggyback onto a popular concept but rather to see through the current glitz to help build a solid foundation for the long-term development of a useful concept.

After a decade of unprecedented growth, the social capital approach has now reached a point where serious theoretical reflections are imperative to maintain the concept's integrity when applied to empirical research. A way of reflecting on the fundamentals of the social capital concept is to go back to the foundational ideas. This edited volume is intended to provide the readers with such foundational ideas pulled together in one volume. To do so, we will first provide our own definition of social capital and explain how we see this concept related to the second-generation of theories of collective action. Then, we will provide a brief

overview of the chapters that we have selected for this volume. Given the recent enthusiasm and confusion about the meaning of this term, we have tried to provide a set of foundational readings that focus on how, or the way, individuals relate to one another affects their own and others' longterm benefits (both positively and negatively). Only after providing this foundation, do we then select a few of the recent empirical studies of social capital to illustrate some of the current ways it is measured, and its impact.

2. Social Capital and the Second-Generation Theories of Collective Action

Theories of collective action play a key role in the current formulation of the concept of social capital. Collective-action theories - especially with their lively development into behavioral, evolutionary, and indirect evolutionary versions - will, and should, provide further analytical foundations for future social capital research. The economic and political performances of societies, from villages to international communities, depend critically on how the members of a community solve the problem of collective action. Contemporary theorists of social capital, almost without exception, open their discourse on social capital by placing the problem of collective action at the center of economic and political problems. However, the linkage of collective-action theories and the social capital approach is, at best, incomplete up to now.

Social capital researchers use the collective-action paradigm primarily to frame their research problems. Incorporating forms of social capital, such as trustworthiness, networks, and institutions, into a collective-action framework is a frequent approach in narratives, but is more rare in analytically rigorous formal models.¹

A fundamental limitation exists for the first-generation collective-action models, however, that assume homogeneous, selfish individuals. The meanings of trust and norms either cannot be properly understood, or may only be captured to a limited extent, from the perspective of the first-generation collective-action models. Second-generation theories of collective action are informed by decades of experimental studies influenced by behavioral and evolutionary game theoretic models. This section discusses how the forms of social capital, their particular configurations, and their interaction with other factors facilitate collective action from the perspective of a fledgling second-generation collective-action theory.²

2. 1. What is Social Capital?

First, however, let us clarify our own definition of social capital. All forms of capital involve the creation of assets by allocating resources that could be used up in immediate consumption to create assets that generate a potential flow of benefits for some set of individuals over a future time horizon. Capital in its most basic sense is a set of assets capable of generating future benefits for at least some individuals (Lachmann, 1978). The set of individuals involved may be relatively small, such as a family or a work team, or quite large, such as the participants in an economy or a political system. The flow of benefits generated by capital may all be positive or a smaller group may be benefited while a larger group is harmed. The latter can occur when social capital is used to facilitate collusion among a smaller group leading to high benefits for those involved and generating negative externalities for others. This dark side of social capital can involve police gaining trust in each other to collude not to report excessive force (Langbein and Jorstad, 2002), corporations or nations colluding with one another to create cartels (Hoffman and Libecap, 1995), or members of the Mafia colluding to undertake illegal economic activities (Gambetta, 1988).

Capital always involves multiple forms. Examples of physical capital include roads, irrigation systems, schools, factories, and the machinery inside factories. Human capital includes many kinds of different forms of knowledge and personal skills. For some purposes, scholars can reasonably attach a value to a particular form of physical or human capital - a factory or a college degree. To do so requires substantial knowledge about the date of acquisition, the specific sector, the amount of maintenance invested over time, and the future demands for this particular type of capital. With even more assumptions, one can measure aggregations -the industrial capital of a nation or its educational achievement. Whether the assigned aggregate value of a particular form of capital is meaningful depends on the question being asked, the detailed type of information contained in the estimate, and the accounting formulas being used.

Given the diversity of forms of physical and human capital, it is not surprising that we assume that there are multiple forms of social capital. We have selected three broad forms of social capital that are particularly

important in the study of collective action: (1) trustworthiness, (2) networks, and (3) formal and informal rules or institutions. We view social capital as an attribute of individuals and of their relationships that enhances their ability to solve collective action problems. The relevant forms of social capital and their specific roles need to be provided by the theoretical framework in which the concept is located. We regard second-generation collective-action theories as the organizing tool for social capital discourse. Therefore, this section starts with a brief discussion of second-generation theories of collective action.

2.2. Second-Generation Collective-Action Theories

Theories of collective action concern settings in which there is a group of individuals, a common interest among them, and potential conflict between the common interest and each individual's interest. Collective-action problems arise whenever individuals face alternative courses of actions between short-term self-regarding choices and one that, if followed by a large enough number of individuals in a group, benefits all. The problem is one of overcoming selfish incentives and achieving mutually beneficial cooperative ways of getting things done.

Solving the dilemma of collective action is not that easy; whatever others do, an individual is always better off by choosing not to cooperate with others. The game of the Prisoner's Dilemma characterizes the situation succinctly. It has been considered the central problem of political science (E. Ostrom, 1998).

The first generation of collective-action theories (Olson, 1965; Hardin, 1968) concluded that individuals could not achieve joint benefits when left by themselves if everyone would benefit whether or not they contributed to the effort. The ways of overcoming the supposed inability of individuals to solve these problems included regulation by an external authority, provision of selective incentives, or privatization. The first-generation collective-action theories were a valid criticism of the naive belief that individuals with common interests would voluntarily act to achieve those common interests, expressed by earlier group theorists such as Bentley (1949) and Truman (1958). Research on collective action has shown that the first generation theories, while not entirely wrong, represent only the limiting case of the ways that collective-action situations are structured and how individuals cope with them (Blomquist, 1992; Bolton and Ockenfels, 2000; Feeny et al., 1990; E. Ostrom, 1990; McCay and Acheson, 1987 - to name just a few relevant studies).

At the core of the first-generation theories of collective action is an image of atomized, selfish, and fully rational individuals. In reality, individuals do not live in an atomized world.

Many collective-action problems are embedded in pre-existing networks, organizations, or other ongoing relationships among individuals. Second, the universal selfishness assumption has been repeatedly rejected by empirical research conducted in the field and the experimental laboratory (see E. Ostrom, 1998 for an overview of this research). Individuals do exist who are concerned only with their own immediate material gains at the expense of others. At the same time, there is also a significant proportion of individuals who, in game-theoretic terms, have nonselfish utility functions. They take into account other individuals' interests as well as their own in the decisions they make (Frey, 1994, 1997). Further, nonselfish individuals also differ among themselves in terms of the extent to which they depart from purely selfish motivations.

Unlike first-generation theories of collective action that presuppose universal selfishness, second-generation collective-action theories acknowledge the existence of multiple types of individuals as a core principle of modeling (E. Ostrom, 1998). In addition to the standard noncooperative game theory that has been the key modeling tool of the first-generation collective-action theories, second-generation theories also use behavioral and evolutionary game theories (Gintis, 2000; Henrich, 2000). Many models of collective action based on behavioral or evolutionary game theories still use the solution concepts of the standard noncooperative game theory. They address new kinds of questions, however, that are particularly relevant to social capital research. For example, one of the main concerns of behavioral game theory is the problem of social motivations, which has a direct implication to the discussion of trust and trustworthiness in social capital research. Another example is the problem of endogenous preferences, a key issue in evolutionary game-theoretic approaches to collective action (Bowles, 1998,2000; Girth and Kliemt, 1998; Girth, Kliemt, and Peleg, 2000; Giith and Yaari, 1992), that provides a way to model the historical interaction between the institutional structures and the quality of citizenship described by Putnam et al. (1993, Chapter 11 in this volume). We will not actually construct game-theoretic models that link forms of social capital to collective

action, but we will use game-theoretic languages whenever it helps to clarify our points.

3. Forms of Social Capital, Trust, and Collective Action

In this section, we present our views on the forms of social capital, how they enhance trust among people and, thus, breed cooperation in a collective-action situation. We emphasize two points. First, social capital is a general rubric. The fundamental theoretical question is how collective action is achieved. Various aspects of collective action can be studied without necessarily resorting to the concept of social capital. However, there are important contexts in which the concept of social capital is quite useful. While many factors that facilitate collective action have been studied separately, and will need to be in the future, it is also useful to put them together in a synthesizing context. This is because in real-world, collective-action situations, the success and failure of collective action is determined not by any single factor but by a complex configuration of various factors that we categorize as forms of social capital.

It is not surprising, therefore, that the concept of social capital has been developed not in pure theory but primarily in the context of addressing political and economic problems that real world human communities face. Social capital in this sense is a core theoretical concept that helps to synthesize how cultural, social, and institutional aspects of communities jointly affect their capacity to deal with collective-action problems.

Second, the ideas fundamental to the social capital approach cannot be entirely captured by the first-generation collective-action theories that tend to reduce 'cultural' concepts such as trust, trustworthiness, and norms to incentives embedded in social structures of interaction. It is essential to couple social capital to the second-generation theories of collective action that regard heterogeneous preferences seriously. In addition, the meanings of trust, trustworthiness, and norms take completely different routes between the first- and second-generation theories of collective action. In the first-generation theories of collective action, trust and trustworthiness are redundant concepts that can be readily explained away by incentives and their behavioral effects on self-interested actors. On the other hand, second-generation theories of collective action, while wholeheartedly accepting the importance of incentives on behavior, also recognize genuine trustworthiness. Trustworthiness is defined in terms of preferences that are consistent with conditional cooperation even in the absence of material incentives. Trustworthiness is an independent and non reducible reason why some communities achieve collective action while others fail. Many social capital researchers are not conscious of, let alone explicit, about the underlying version of collective-action theories on which their discourse on social capital and trust are built. It appears to us that this lack of clarity of the meanings of trust and trustworthiness is one of the major reasons why the concept of social capital has been confusing to many analytically acute critics.

3.1. Trust as Linkage between the Forms of Social Capital and Collective Action

The various forms of social capital contribute to successful collective action, almost always by enhancing trust among the actors. In other words, we see trust as the core link between social capital and collective action. Trust is enhanced when individuals are trustworthy, are networked with one another in multiple ways, and are within institutions that facilitate the growth of trust. These relationships are shown in Figure 1. We agree with Torsvik (2000) that trust itself is not a form of social capital but an outcome of the forms of social capital and a key link between social capital and successful collective action. The existence of trust among a group of individuals can often be explained as a result of the presence of some configuration of the forms of social capital.

Forms of Social Capital	Contextual Variables	
Trustworthiness		
Trust		Collective Action

Institutions		
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Figure 1 Forms of Social Capital, Trust, and their Linkage to Achieving Collective Action

Drawing on Gambetta (2000, Chapter 13 in this volume), we define trust as 'a particular level of the subjective probability with which an agent assesses that another agent or group of agents will perform a particular action'. Thus, trust allows the trustor to take an action involving risk of loss if the trustee does not perform the expected action (E. Ostrom and Walker, 2003). Another crucial aspect of trust is that it involves an opportunity for both the trustor and the trustee to enhance their welfare. Let us think of a business transaction in which agent A has to pay before agent B delivers the desired good. If A pays the price and B delivers the good, both are better off than in the absence of the transaction. B might be tempted not to deliver the good even after A has paid the price. This lack of trustworthiness would leave agent A with a net loss. If A does not trust B in the first place and refuses to complete the transaction, B will have lost an opportunity to sell his product and thus increase his wealth.

Thus, trust and trustworthiness are essential for the completion of many complex transactions in modern life. As Kenneth Arrow (1972: 357), the Nobel Prize-winning economist pointed out: 'Virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time. It can be plausibly argued that much of economic backwardness in the world can be explained by a lack of mutual confidence.'

Theoretically, the subjective belief of a trustor can be independent of objective conditions. One can falsely trust someone who is not trustworthy and experience losses. It is quite reasonable, however, to assume that trust as a subjective belief cannot be sustained in the long run unless it is verified frequently by the behavior of the trustee. Trust also involves trustworthiness of the trustor. Technically, when trust is defined as a subjective belief about a trustee's unobservable or not-yet-observed behavior, it is possible that an untrustworthy individual trusts another agent. But saying that A, who wouldn't repay what he borrowed from B, trusts B to repay what B might borrow from A himself, is highly unlikely.³

The variants of the Prisoner's Dilemma game in standard noncooperative game theory provide ample examples where the expectations of others' behavior in collective-action situations can be reduced to other factors. Repetitive interaction among individuals - a sign of a robust network and an important form of social capital - provides incentives to individuals to build a reputation of being trustworthy. Even very selfish individuals may not betray the trustor under those circumstances. In fact, precisely because he is selfish and he wishes to obtain gains from future transactions with the trustor, a selfish individual embedded in assured repetitive interactions will be more likely to reciprocate trust.

Dense horizontal networks with the capability of efficiently transmitting information across the network members also create incentives to behave in a trustworthy manner for those who have only selfish motivations. Suppose that, though the transaction between A and B is not of a repetitive nature, there are other agents C and D who obtain information about the transaction and condition their future transactions with A on whether A behaves trustworthily in his transaction with B. Then again, A has an incentive not to betray B, not because of the prospects for future gain from transactions with B, but in expectation of those from C and D. Used-car dealerships increasingly rely on Internet auctions to sell their stock. Since most consumers buy cars only infrequently, the transaction is most likely of a one-shot nature. The managers of the Internet auction sites typically provide potential consumers with the information about the dealers' past transactions. They actively solicit comments from the past consumers on the dealers' trustworthiness and post them on the auction sites so that potential buyers can see how the dealer has behaved in the past.

Institutional rules also create incentives for the parties of transactions to behave trustworthily. They can influence behavior directly by establishing mechanisms of rewards and punishment or indirectly to help individuals govern themselves by providing information, technical advice, alternative conflict resolution mechanisms, and so forth. When effective formal or informal institutions exist that specify punishments to be imposed on those who do not keep contracts, they affect a trustor's assessment of the trustee's future behavior. Intentionally not delivering the goods after receiving the payment for them constitutes a crime. Though the existence of laws that punish fraud may not completely eliminate the possibility of fraud, it does increase the trustor's assessment that the trustee will abide by the terms of the transaction. The quality of a rule-in-use, or a statute as a form of social capital, depends not only on content but more critically on how

they are actually implemented.

We have so far examined how networks and institutions enhance trust among individuals in a collective-action situation. In sum, they change the incentive structure of the trustee. As a result, the trustor knows the incentive structure that the trustee faces given the repetitive nature of the interactions, the existence of other network members who observe the trustee's behavior, and the rules and laws that punish or reward the trustee. Common understanding between the trustor and trustee regarding the existence and functioning of those factors encourages them both to engage in productive transactions.

The impact of these linked relationships of diverse forms of social capital can be illustrated with an empirical study of over 200 irrigation systems located in 29 of the 75 districts of Nepal (Joshi et al., 2000). Collective-action problems potentially exist on all irrigation systems in the world since considerable input is needed to assure that water is distributed according to rules and not to the strongest and most aggressive farmer. Extensive maintenance activities are also undertaken regularly. National and local government agencies undertake these responsibilities in many developed countries and are able to manage these systems relatively efficiently only in some locations. Government agencies in developing countries, such as Nepal, do not hire sufficient irrigation staff (or pay them well enough) to keep water distribution orderly or to maintain canals in good repair (see Lam, 1998; Sparling, 1990).

Joshi and colleagues were able to measure key variables in this study on both government and farmer-managed systems. They found, as others had before, that government systems were less effective, efficient, and equitable than farmer-managed systems. It is important, however, to determine why these relationships exist. To address this question, they found that the relationships between the overall condition of the irrigation system, the technical efficiency of moving water from the head to the tail of the system, the economic efficiency of systems, and the equity of water distribution within systems was consistently related to (1) the presence of guards drawn from the set of water users themselves, (2) the level of rule compliance of farmers to rules related to water distribution and maintenance, (3) the likelihood that official sanctions would actually be imposed and collected on those who did break rules, and (4) the level of mutual trust that existed among farmers using the system. Thus, the level of social capital in the form of the network of farmers, their rule-following behavior, and the sanctioning behavior as these affected mutual trust, explain the consistently higher performance of farmer managed irrigation systems as contrasted to agency-managed systems in Nepal. In this case, trust is clearly transformed into better maintained physical infrastructure and water distribution patterns that enhance economic productivity.

3.2. Trustworthiness as a Form of Social Capital

Trust cannot always be explained entirely by the incentives embedded in the structure of social interactions created by networks and institutions. The trustworthiness of trustees often results from the characteristics of the trustees themselves. Imagine a transaction that occurs in absolute absence of other forms of social capital: no repetition, no networks, and no possibility of external sanctions. An example is a local villager being asked for help by a lost traveler who promises to repay twice the worth of what he is asking at a later time. Another example is a first mover in a single-play sequential Prisoner's Dilemma experiment conducted in a doubleblind procedure. Both face a decision whether or not to trust the other's pure motivation. In those cases, the probability assessments by the trustors depend only on their belief regarding the trustees' motivation. Without any specific information about the trustee's trustworthiness or the structural incentives the trustee faces, a trustor regards the trustee as being drawn from a population of heterogeneous individuals. The individual who wants to be trusted in these cases is represented as coming from a population in the trustor's mind. The distribution of trustworthy individuals in this hypothetical population is based on the trustee's observable characteristics (if these can, indeed, be observed), such as appearance, dress, gender, age, language, and so forth (see Frey and Bonnet, 1996).

The above examples are presented to abstract a trustor's belief about a trustee's motivation as an independent source of the trustor's expectation of the trustee's behavior. We emphasize that individuals' intrinsic values are an independent reason for behaving cooperatively and reserve the term trustworthiness primarily to refer to such intrinsic motivation. In the language of game theory, trustworthiness is a component of the trustee's preferences. As numerous one shot sequential experiments using monetary payoff structures of the Prisoner's Dilemma game have shown (see, for example, Ahn, Ostrom, and Walker, forthcoming), a

significant number of individuals in the trustee's position do choose to reciprocate. At the same time, not all do.

The fact that the magnitude of the gains from exploitation matters (Ahn et al., 2001; Clark and Sefton, 2001) indicates that individuals are distributed on a continuous scale of trustworthiness. In other words, the size of the internal parameter that the individual assigns to behaving in a trustworthy manner varies across individuals (Crawford and Ostrom, 1995). Behavioral game theorists (Bolton and Ockenfels, 2000; Fehr and Schmidt, 1999) have developed formal models to reflect such motivational heterogeneity. While trustworthiness is an effective term to refer to the characteristics of individual preferences in a collective-action situation, different terms may be used in other contexts such as 'habits' or 'values' (Fukuyama, 1995: 33-5). The culture of a society may be thought of as the preferences or the habits and values of individuals aggregated at a societal level.⁴

Unless trustworthiness as preference is recognized as an independent reason for behaving cooperatively, the concept of general trust becomes rather meaningless (see Hardin, 2002: 60- 62, for example). General trust, borrowing Yamagishi's (2001: 143) definition, is a baseline expectation of others' trustworthiness. If trustworthiness is primarily an effect of networks and ongoing relationships, as Hardin argues, it truly is difficult to conceive of 'general' trust or 'average' level of trustworthiness. Then again, social capital itself is more or less irrelevant beyond the confines of a network. But if one acknowledges that among multiple communities of a comparable size, from villages to nations, the average trustworthiness of people may differ and it affects the way collective-action problems are solved across communities, the concept of general trust and the underlying general trustworthiness become quite meaningful.

Social capital can then become a useful rubric to refer to them along with other cooperation enhancing factors for a society. The potential of modern, market economies and democratic political orders makes it imperative for individuals to deal with others beyond the confines of intimate relations and close networks. Rather, the very condition for a successful market economy and democracy is that a vast number of people relate in a trustworthy manner when dealing with others – many of whom do not know one another and cannot incorporate repeated interaction or a network - to achieve collective actions of various scales. Many of these relationships can properly be characterized as a single-shot situation, or one that is repeated only a few times. The establishment and maintenance of such social relationships depends on the trustworthiness of people that cannot be explained away by the incentives provided by the structure.

We think that a key aspect of trust is the belief about others' intrinsic motivation -trustworthiness. Putnam's (2000: 136) 'thin trust', or Rahn and Transue's (1998: 545) 'social, or generalized trust', that gives a stranger the 'benefit of doubt', agree with our view of trust. However, outside the experimental laboratory, it is difficult to measure the marginal contribution of trust in this sense in the formation of one's expectation of other's behavior. It is usually a configuration of the intrinsic motivation, the surrounding social structure, and the possibility of rule enforcement that influences an individual's decision whether or not to reciprocate when trusted. A trustor's expectation of trustee's behavior also takes into account this configuration of factors.

The trustworthiness of a population can be formalized in game theory by introducing a generic utility function that contains a 'type' parameter (Crawford and Ostrom, 1995). Suppose the parameter takes a value of 0 for purely selfish individuals, whose cooperative behavior can only be induced by other forms of social capital, and a value of 1 for those who are entirely trustworthy, who would behave cooperatively in the absolute absence of other cooperation enhancing social capital. Then, the statistics of the parameter for a population, its mean value and variance, and so forth, is an independent input to the trustor's probability assessment when faced with an anonymous individual or individuals in a collective-action situation. The evidence suggests that few individuals are truly unconditional altruists who cooperate or trust others no matter what! Rather, in addition to networks and institutions, considerations of equity and fairness also affect the likelihood of individuals adopting conditional cooperation in collective action situations (Ann, Ostrom, and Walker, forthcoming; Bolton and Ockenfels, 2000; Fehr and Schmidt, 1999).

Reciprocity is an internalized personal moral norm as well as a pattern of social exchange. E. Ostrom (1998: 10) defines reciprocity as involving a family of strategies in collective action situations including (1) an effort to identify who else is involved, (2) an assessment of the likelihood that others are conditional cooperators, (3) a decision to cooperate initially with others if others are trusted to be conditional cooperators, (4) a refusal to cooperate with those who do not reciprocate, and (5) punishment of those who betray trust.

As the above definition indicates, trust and trustworthiness are integral elements of reciprocity. An individual who abides by the norm of reciprocity is trustworthy. The information about others' trustworthiness is an essential input to a reciprocal individual's decision whether or not to cooperate. That the norm of reciprocity prevails in a society implies that a significant proportion of individuals in the society are trustworthy. Putnam et al. (1993, Chapter 11 in this volume: 229) stress generalized reciprocity, which they define as 'a continuing relationship of exchange that is at any given time unrequited or imbalanced, but that involves mutual expectations that a benefit granted now should be repaid in the future', as an especially productive component of social capital.

Reciprocity as a prevailing pattern of interaction among individuals is, in game theoretic terms, an efficient equilibrium of repeated social dilemma games with multiple types of individuals and incomplete information. Ahn (2000) studies a social dilemma action situation in which there is a continuum of types, from those who are purely selfish to those who have strong orientation toward fairness. He shows that if there are enough nonselfish individuals and the material gains from defection are not too big, an equilibrium exists in which mutual cooperation persists to near the final stage of the game. The equilibrium strategy of the nonselfish players closely resembles the five behavioral rules of reciprocity that Ostrom outlines. However, even when the proportion of nonselfish individuals is large, mutual defection still constitutes another equilibrium of the game. The analysis implies that for reciprocity to prevail as patterns of social interaction, trustworthy individuals need not only to overcome the temptation to freeride but they also need to coordinate their actions successfully.

3.3. Networks as a Form of Social Capital

We have already discussed the impact of networks on behavior during our discussion of trust. However, networks do more than simply provide additional incentive for behaving cooperatively to selfish individuals. As Putnam et al. (1993, Chapter 11 in this volume: 229) point out, dense networks of social exchange are a crucial condition for the rise of the norm of generalized reciprocity. When trustworthy individuals who are willing to cooperate with others constitute only a small minority of a society's whole population, one condition for them to survive, prosper, and spread is to establish a network among them. Evolutionary theorists (Ahn, 2001; Axelrod, 1981,1984; Bendor and Swistak, 1997; Giith, Kleimt, and Peleg, 2000; Heiner, 2002; Richerson, Boyd, and Paciotti, 2002; Trivers, 1971) have shown that when reciprocal agents using conditionally cooperative strategies have a higher chance to interact with one another than with the surrounding population in general, they can invade a population composed of agents who always defect. Information regarding a potential transaction partner's trustworthiness is crucial when trustworthy individuals try to initiate cooperation. Dense social networks also encourage the development of reciprocity norm through the transmission of information across individuals about who are trustworthy and who are not.

Putnam et al. (1993, Chapter 11 in this volume: 173) distinguish two forms of networks: a horizontal network that 'brings together agents of equivalent status and power' and a vertical network that links 'unequal agents in asymmetric relations of hierarchy and dependence'. They argue that networks of civic engagement represent both dense and horizontal social interactions and have the most powerfully beneficial side effects for the society as a whole. While vertical networks also contribute to solving collective-action problems to some extent, upward sanctioning is difficult when agents are not considered equal. Family and kinship relations have the characteristics of a dense network, but the ties in those relations are too strong. Thus, the reciprocity norm developed in family and kinship networks often fails to spread to the society as a whole. For that reason, Putnam agrees with Granovetter (1973, Chapter 5; 1985, Chapter 6 - both in this volume) in that overlapping 'weak ties' are more important than intense personal ties in sustaining social stability and collective action.

3.4. Institutions - Formal and Informal Rules as a Form of Social Capital

We define institutions in broad terms as prescriptions that specify what actions (or outcomes) are required, prohibited, or permitted, and the sanctions authorized if the rules are not followed (Crawford and Ostrom, 1995; E. Ostrom, Gardner, and Walker, 1994: 38). Institutions are thus the rules of a game that people devise (North, 1990). Rules are the results of human beings' efforts to establish order and increase predictability of social outcomes. Rules can be used to increase the welfare of many individuals or, if

collective-choice processes are controlled by a well-organized subgroup, to benefit that group more than others.⁵

Written laws, administrative regulations, court decisions, and so forth are formal rules written on paper and enforced by public authority. Grootaert (1998) considers the view of social capital that includes 'formalized institutional structures, such as governments, the political regime, the rule of law, the court system, and civil and political liberties' as the most encompassing.

Many scholars (for example, Fuller, 1981; Taylor, 1982) have argued that legal rules and formal institutions are an ineffective means to solve collective-action problems, and sometimes might even undermine the very basis of social cooperation. This view is a valid criticism to Hobbesian tradition in which the state is regarded as the inevitable and omnipotent solution to the collective-action problem (see V. Ostrom, 1991, 1997). We think that this criticism, however, should not be stretched so far as to deny the significant role of formal laws at national, regional, and local levels in sustaining and facilitating social cooperation. First of all, formal laws, or the characteristics of a political system broadly understood, can encourage or discourage individuals' efforts to voluntarily solve their collective-action problems. Though no authoritarian regime can completely demolish peoples' will and ability to self-organize to deal with the problems they face on a daily basis, whether or not a regime explicitly allows and even encourages those activities makes a big difference for the fate of self-governance. In addition, formal laws, government agents, and courts are important sources for self-governing individuals as they seek technical advice, information, and complementary monitoring and sanctioning systems. Therefore, a rule of law, a democratic atmosphere, and a well-structured government (if these exist) are valuable social capital for any society.

In democratic societies, individuals in private firms, voluntary associations, and villages are allowed to devise their own rules and enforce these rules to deal with the daily concerns insofar as those rules are 'within the broad set of potentially lawful rules that are theoretically consistent with the larger constitutional system' (E. Ostrom, Gardner, and Walker, 1994: 39). These working rules (or rules-in-use) are another important form of social capital. Formal laws themselves are often major sources of working rules especially when backed with close monitoring and sanctioning by public authorities. The difference between working rules and formal laws depends on the contexts in which the working rules operate and the extent that formal laws apply to those contexts. No formal laws can completely cover the exigencies arising in daily life, thus the roles of working rules 'may involve no more than filling in the lacunae left in a general system of law'. However, when the mandates from relevant laws and official regulations are deemed impractical or improper, individuals may devise their own working rules that 'assign *de facto* rights and duties that are contrary to the *de jure* rights and duties' (E. Ostrom, 1992, Chapter 12 in this volume).

To provide themselves with working rules to deal with their collective-action problems, individuals need to invest in those working rules in the form of devising, revising, monitoring, and sanctioning. While the difficulties of sustaining long-term collective action are substantial, the benefits of creating local organizations and selecting locals as leaders who are rewarded for their performance can offset these high costs. Instead of presuming that individuals face an impossible task, we are better advised to assume that it is possible, even though difficult, for those facing severe collective-action problems to overcome them. To do so, they need sufficient local autonomy to invest in the social and physical capital involved in building systems and monitoring performance.

No general set of formal rules exists that guarantees successful development of working rules in all contexts. Efforts to generalize have been made to identify relevant variables that the crafters of working rules need to consider. E. Ostrom (Chapter 12 in this volume) suggests some of them in the context of crafting institutions for self-governing systems. Those variables include environmental conditions, cultural traditions, and monitoring, sanctioning, and conflict resolution mechanisms.

The rules used by individuals to structure their patterns of relationships may enhance or retard the creation of other forms of social capital and also affect the level and impact of human and physical capital. Rules relate to patterns of activities at several levels, including day-to-day operational activities, all the way to constitutional activities that create and recreate the general patterns of authority in a society. The type of rules that individuals will find productive depends upon the kinds of norms and patterns of reciprocity that already exist.

Similarly, patterns of trust and reciprocity will depend to a large extent upon the types of rules that are crafted in any polity. Self-governing systems in any arena of social interactions tend to be more efficient and stable not because of any magical effects of grassroots participation itself but because of the social capital in the form of effective working rules those systems are more likely to develop and preserve, the networks that the participants have created, and the norms they have adopted. For example, many scholars have found it hard to understand why the 'primitive' irrigation systems built by the farmers themselves significantly outperform those that have been improved by the construction of modern, permanent, concrete, and steel headworks, often funded by donors and constructed by professional engineering firms (E. Ostrom, 1999).

Many factors contribute to these results, most of them related to the incentives of key participants in the finance, design, construction, operation, and maintenance of differently organized irrigation systems. On farmer-governed irrigation systems, farmers craft their own rules to counteract the perverse incentives that they face given the physical and cultural setting in which they are enmeshed (Joshi et al., 2000; E. Ostrom, 1992, Chapter 12 in this volume).

These rules are frequently invisible to project planners when they design new physical systems. In project planning, most effort focuses on how to improve physical capital, such as creating permanent head works, that affects various aspects of the technical operation of a system. How these variables affect the incentives of participants is rarely explored. Unless the changes in physical infrastructure are undertaken with a consciousness that they will affect the incentives of participants - sometimes in perverse manners - projects intended to do good may generate harm instead. In other words, investment in physical capital that does not also include efforts to improve social capital and the fit between social and physical capital hardly guarantees desired consequences.

Simply agreeing on an initial set of rules, on the other hand, is rarely enough. Working out exactly what these rules mean in practice takes time. If those learning how to use a set of rules do not trust one another, further investments are needed in extensive monitoring activities. Appropriate sanctions for non conformance must be developed. Conditions under which exceptions to rules can be made without endangering the basic ordering principles must be discovered and discussed. Conflict over rule interpretation and adjustment will occur, which if no facilities for conflict resolution are available, may destroy the process of building capital before it gets very far. The time it takes to develop a workable set of rules, known to all relevant parties, is always substantial. If this is the first time a set of individuals has attempted joint activities, the time needed and the level of contestation involved in the process will tend to be higher than in settings where the same set of individuals has worked well together in the past.

Part of learning through experience is what happens when things go wrong. In all practical affairs, many things can go wrong. Everyone may not have received the same information about joint objectives, processes to be followed, and how one process feeds into another. Some may do their part while others fail to perform. Some may want to interpret a rule in a way that is harmful to the interests of others. There may not be fair and objective conflict resolution processes available. Conflict may destroy prior lessons about how to work together and may reinforce prior doubts about the reliability and trustworthiness of some participants.

Thus, social capital is not only created, it can be weakened, destroyed, strengthened, or transformed. Social capital can be characterized as outdated, up-to-date, or ahead of its time. It may enhance the outcomes of a few without any impact on others. Or, advantages to the few may come at the expense of others. Alternatively, the advantages to a few may generate positive benefits for others. A system of government based upon military command and use of instruments of force can also destroy other forms of social capital while building its own.

4. A Guide to the Articles in this Volume

Part I of the volume includes classical writings that may or may not use the word 'social capital' but are fundamental in relating the ideas underlying social capital to the history of Foundations of Social Capital thought. The entire volume of de Tocqueville's *Democracy in America*, as many of the contemporary authors acknowledge (for example, Fukuyama, 1999, Chapter 14; V. Ostrom, 1980, Chapter 9; Putnam et al., 1993, Chapter 11 - all in this volume), elucidates ideas that are of fundamental significance to understanding the conditions of modern democratic order. With a caveat that the relevance of de Tocqueville's thoughts is by

no means fully captured in the several chapters excerpted in the current volume, we have selected chapters that have the most direct bearings to the ideas and concepts of the contemporary social capital approach, de Tocqueville saw a contradiction, a potentially dangerous one unless properly addressed, in the fledgling American democracy. While democracy expands the condition of equality among the citizens, at the same time it creates a tendency to atomize individuals by undermining the old fabric of a society. A bottom-up reconstruction of self-governing order is a prerequisite to a viable democracy. De Tocqueville observes that 'Americans of all ages, all conditions, and all dispositions constantly form associations' (1945, Chapter 1 in this volume: 3). And there he saw how the new kinds of social bonds arose to buttress the democratic order.

The works of Hanifan (1920, Chapter 2 in this volume) and Jacobs (1961, Chapter 4 in this volume) are often cited as merely containing the words social capital. We consider that the contributions of Hanifan and Jacobs's articles are more than their use of these words. Granted that neither elaborates social capital as a concept - instead, as Hanifan says, they use the concept rather 'figuratively'. Jacobs' chapter, as a matter of fact, has only a single appearance of the term social capital. But careful readers will fathom the depth in their thoughts and the direct relevance of their writing to the current social capital research. Hanifan has a definition of social capital that is quite close to many used today: 'that in life which tends to make these tangible substances count for most in the daily lives of a people; namely, good will, fellowship, sympathy, and social intercourse among the individuals and families who make a social unit' (p. 22). In particular, the article carefully documents how an entrepreneur, a school district supervisor, built the stock of social capital of a rural community in a short period of time using schools as community centers, and helped to achieve 'the general improvement of the community well-being' (p. 23).

We include Schultz's (1961, Chapter 3 in this volume) seminal article on human capital for two reasons. First, human capital is by itself important in understanding social capital.⁶ Building and utilizing physical, human, and social capital are analytically separable, but closely intertwined in reality. Second, we call attention to the way the concept of capital itself is transformed when human capital is considered. The concept of human capital is today widely accepted. In the earlier stage of its development, the use of capital referring to knowledge and skills embedded in humans was heavily criticized.

Exactly the same thing is happening now with regard to use of the concept of capital in 'social capital'. One does not wish to arbitrarily modify such a foundational concept as 'capital'. It is also counterproductive, however, to assume that the concept of capital has a fixed set of innate meanings. As knowledge grows, the denotation and connotation of a core scientific concept may change in a direction that is not purely whimsical. Conceptual development may well be productive in helping scholars understand more phenomena using a core set of conceptual tools. The various forms of social capital may fail to demonstrate the characteristics of physical capital, as understood by some contemporary economists. One does not want to defend social capital by trying to demonstrate the exact correspondence between physical and social capital. That battle is certainly not winnable. It does not invalidate the Second, Coleman was really the first scholar to attempt a careful conceptualization of the concept of social capital. Coleman's 1988 article (Chapter 8 in this volume) has become mandatory reading for any scholar beginning work in the field of social capital. While he overtly used a functional definition, he also clearly indicated that many forms of social capital existed. Coleman also related social capital to the problem of collective action, by recognizing the public good nature of social capital. Many of his original insights are now crystallized after more than a decade of intense and exciting progress in behavioral approaches to collective action. Now, researchers use various advanced methods to identify factors, measure them, and establish causal relations among those factors in the field (see Krishna, 2002), in formal models (see James, 2002), and in experimental laboratories (see Brosig, 2002). It is hard to imagine the rich developments in social capital research occurring without the stimulus of Coleman's 1988 article.

V. Ostrom's 'Artisanship and Artifact' (1980, Chapter 9 in this volume) provides the analysis of a contemporary political philosopher and an ardent student of de Tocqueville's understanding of political order. He urges scholars to view the structure of relationships among individuals - human organizations broadly defined - as artifacts that are the result of artisanship. This leads to several core problems. The first problem arises from the fact that as Hobbes long ago recognized, human beings are both the 'matter' and the 'artificers' of organizations. 'Human beings both design and create organizations as artifacts and themselves form the primary ingredients of organizations. Organizations are, thus, artifacts that contain their own artisans' (p. 186). The second problem is that organizations or networks as artifacts depend on word ordered

relationships for creating structure among the participating artisans. Words are always fragile ways of creating structure given the constant change in semantic understanding. Further, many of the artifacts created by humans are themselves the modes of producing other outputs.

Indeed, for an organization or network to qualify as social capital as we use the term in this Introduction, it must generate some flow of benefits beyond simply the creation of the structure itself. Thus, V. Ostrom points to the complexity of some of the recursive structures involved in many forms of social capital and the type of analysis that a researcher should bring to bear in attempting to explain patterns of outcomes.

Part III of this volume collects articles that are more specific to one or more of the 'forms' of social capital. The articles in part III are selected to provide more rigorous theoretical treatment of each of the forms of social capital - either treated separately or together. Most of the articles also discuss social capital in the context of collective-action problems. Burt's 1992 article (Chapter 10 in this volume) is important in two respects. First, it, along with many other works of his (1997a, 1997b, 2000), represents one minimalist view of social capital by focusing on network structure rather than other forms of social capital. Second, even though he argues that social capital cannot be owned by a single individual, his analytical focus is at the level of an individual actor. Using the concept of a structural hole, which captures and recasts Granovetter's 'weak ties' from the perspective of an individual strategic actor who wishes to maximize not only the flow of information but also the control capability, Burt shows how an individual can utilize the structural hole to increase one's power.

We have earlier mentioned that Coleman's most important contribution to social capital research is that he explicitly recognizes the public good nature of social capital, and that in expounding the effects of social capital, he basically puts it in the context of collective action. Putnam et al. (Chapter 11 in this volume), in their effort to synthesize the learning from their Italian study, directly, unambiguously, and most explicitly link social capital to collective action. Thus, Putnam et al. (1993, Chapter 6) title the concluding chapter 'social capital and institutional success' and open the chapter with a subsection titled 'the dilemmas of collective action'. Putnam et al. go on to discuss how social capital, which they define as 'features of social organization, such as trust, norms, and networks' (p. 224), helps individuals to solve the collective-action dilemmas and, thus, improve social efficiency.

One of the conceptual debates on social capital focuses on which factors are forms of social capital, and which are mere consequences of it. E. Ostrom's contribution to this volume (1992, Chapter 12 in this volume) provides an argument that institutions, understood as rules-in-use, are an essential form of social capital. E. Ostrom does not assume that there is a well-accepted definition of an institution. Rather, her way of understanding an institution - a set of rules that are formal and often informal - opens the possibility of regarding institutions as a group or a society's capital input and independent cause for the success and failure of collective endeavors.

Those who believe that formal laws always exist and that individuals follow those formal laws invariably would not quite agree to including rules as a form of social capital. However, when one penetrates beyond formal and written rules, one sees the variety of ways in which rules-in use exist. They may in some cases be the same as formal. In other cases, they have developed locally, may be either consistent or contradictory to formal rules, and may not even be in writing. The key to their importance is whether they provide incentives for certain behavior and function as constraints.

What's more important at this stage is to enrich the theoretical understanding of the factors often referred to as forms of social capital, in the context of a collective-action situation. Arguing over which forms are social capital and which are not - a debate over ill-defined terms - does not advance understanding in the long run. While Gambetta's 'Can We Trust Trust?' (2000, Chapter 13) does not overtly focus on social capital, his focus on trust is an extremely insightful and penetrating reflection. Even though Gambetta does not directly relate trust to social capital, the relevance of his discussions to social capital should be clear to readers. The theme of collective action is the central context in which Gambetta discusses the concept of trust and thus relates closely to the major theme we are developing in this volume.

Fukuyama's 'Social Capital and Civil Society' (2000, Chapter 14 in this volume: 293), presents a provocative definition of social capital: 'social capital is an instantiated informal norm that promotes cooperation'. He regards other so-called forms of social capital such as 'trust, networks, civil society, and the like' as

'epiphenomenal, arising as a result of social capital but not constituting social capital itself. Note, however, that he also places social capital firmly in the context of collective action. His work nicely complements that of Chapters 16, 17, and 18 on development. As he points out, the past literature on development has frequently viewed what we are calling here social capital to be a 'liability'. Many development policies have been undertaken in an overt effort to wipe out traditional cultures. If these networks of understanding are genuinely a form of social capital, then the important question arises, 'Why wipe out real assets?' Fukuyama's answer is that the network structure of traditional cultures is relatively narrow and does not contain many 'weak links' essential to economic development.

In Chapter 15, Dasgupta considers social capital as a 'system of interpersonal networks'. Trust, norms and enhanced cooperation, and productivity, it follows, are the effects of the networks thus understood. Dasgupta also addresses the question of how network structure -the factor he identifies as the essential component of social capital - affects the performance of an economy at a macro level. He suggests that network externalities that are confined primarily to small groups are closer to a form of human capital. On the other hand, social capital in the form of enhanced cooperative opportunities that spread to an entire economy, corresponds to factor productivity as it is referred to among economists. In other words, social capital improves the performance of an economy by either affecting an argument (human capital) of the social production function, or by affecting the function itself.

Selections in Parts IV and V are chosen because they theoretically and empirically address how social capital affects economic prosperity and political development (see also Isham, Kelly, and Ramaswamy, 2002). Woolcock (1999, Chapter 16 in this volume) and Woolcock and Narayan (2000, Chapter 18 in this volume) relate social capital to the puzzle of economic development strategies of developing countries. Along with E. Ostrom (1992, Chapter 12 in this volume), the two articles urge donors, scholars, and activists to reconsider the past developmental policies that have focused on financial, technological, and physical inputs for economic development of the poorer parts of the world. Their findings are quite consistent with those of Krishna (2002), whose careful study of village-based collective action in India is a model of how to use theory to generate empirical work and how to design empirical studies that illuminate theoretical questions. Development of strong relationships within a community - bonding - is an important form of social capital related to generating outcomes related to survival. The creation of links to individuals outside a narrow community frame, however, is quite essential to the achievement of economic development and growth.

Chapter 19, by Collier and Gunning (1999) on 'Explaining African Economic Performance', is a state-of-the-art analysis that combines empirical and theoretical insights. They argue that the destruction of social capital due to political instability creates perverse incentives for the actors engaged in economic activities. The picture is not entirely grim, however. In some parts of Africa, social capital is being accumulated accompanied by the process of democratization and improved governmental policies. They stress the negative role of donors in the past. Little evidence supports the proposition that donors' demands for policy change in a manner consistent with growing more social capital have been accepted in more than a paper fashion by many African governments. Given the increasing exposure of African leaders to the need to create economic growth, their extensively documented and grim picture may evolve into a more positive picture in the future.

Growing research uses survey data to provide empirical/statistical tests of the hypotheses generated within the social capital literature. We have selected two of these works. Empirical studies using these survey data typically find that the higher the level of trust among the individuals of a nation, region, or a community, the more likely that those individuals would enjoy economic prosperity and democratic governance. Using the World Values Survey of 20 market economies, Knack and Keefer (1997, Chapter 20 in this volume) find that interpersonal trust has a significantly positive impact on investment and growth rates, after controlling for per capita income, education, and investment good prices. They also find that trust is associated with more secure property rights and contract enforceability that they see as main predictors of economic performance. The impact of trust is especially strong in poorer nations.

Building on Putnam and Granovetter's works, many political scientists have conducted empirical research investigating the impacts of networks and associational membership to politics. Brehm and Rahn (1997, Chapter 23 in this volume) examine a crucial link in Putnam's scenario: the impact of civic engagement on trust, using the General Social Survey (GSS) data from 1972 to 1994. Their statistical analyses show that a

tight relationship does exist between interpersonal trust and civic engagement. The relationship, however, is asymmetric in the sense that 'the effect of civic engagement on interpersonal trust was much stronger than the reverse effect' (p. 573). Using survey or census data is a very common strategy of measuring the level of social capital. The method also involves many difficulties and potentially serious problems as we will discuss in the last section of this introduction.

Putnam's 'Tuning In, Tuning Out' (1995, Chapter 22 in this volume) also utilizes several measures of social capital, from the membership records of diverse organizations, surveys of time budgets and political participation, to the results of the GSS. He detects a substantial decline in what he considers to be the stock of social capital in the United States and puzzles about what may cause this decline. After examining several candidate factors, Putnam singles out the increase in time spent on TV watching as a prime suspect.

5. Criticisms of Social Capital

As documented in Table 1, there has been phenomenal and rapid growth of the literature on social capital. Studies using this concept, however, have faced extensive criticism.⁹ Many of the efforts to explain existing puzzles using a social capital approach have been stimulated by a prior lack of attention to concepts like trust, norms of reciprocity, and institutions in much of the economics literature. The literature on social capital was thus trying to integrate some of these important concepts from the other social sciences into a fundamentally economic approach to development. Consequently, one should not be surprised that some of the criticisms represent strong reactions over the introduction of these 'fuzzy' concepts into a discourse that has prided itself on theoretical rigor and objective, quantitative measures. Some economists argue that the concept of social capital is nothing but a bad analogy (Solow, 1999).

Since the investment in physical capital is modeled as a self-conscious, investment process, researchers can monetize a particular stock of physical capital by costing out the resources devoted to constructing it and using appropriate accounting procedures to depreciate the value over time. Not only is physical capital seen as the result of a conscious investment choice but those who own a stock of physical capital are presumed to be able to alienate it if they are given an attractive enough offer from someone who wants to put the capital to another use (Arrow, 1999). Norms of reciprocity, trust, and networks are frequently produced as a by-product of other activities. 'Selling' these forms is somewhat more difficult to conceptualize. These problems tend to disqualify these concepts as forms of capital for some scholars. While institutions are sometimes the result of an evolutionary process, they are more frequently the result of a self-conscious choice. Institutions fit the investment aspect of capital more easily than reciprocity, trust, and networks. Institutions, however, are frequently not included in the popular definitions of social capital presented in many of the chapters in Parts III and IV.

It is time to examine three of the criticisms made against the use of social capital: the lack of self-conscious choice, the inability to alienate these relationships, and the problem of measurement.

5.1. Investing in Social Capital

While some scholars find it difficult to imagine a purposive choice to invest in a friendship network or to adopt a norm of reciprocity in order to gain an increased flow of future benefits, all uses of time are fundamentally purposive. When one participates in a choral society, one is deciding to allocate the most precious resource that humans have - their time - in extensive practice sessions as compared with a wide multitude of other activities that one might spend one's evenings doing. Thus, there is really little question about the conscious choice made when one joins associations, forgoes an immediate payoff in order to follow a norm of reciprocity, exposes oneself to a loss by trusting another, or spends time debating the virtues of alternative rules to be used in future interactions. While all choices can become somewhat automatic in a busy world, these choices are as self-conscious as any other economic or social choice.¹⁰

The real puzzle is not whether these choices are self-conscious, but whether they are a self-conscious investment rather than simply a consumptive activity with an unplanned flow of benefits. Here, an obvious difference exists between participating in a network of friends and choosing rules. Investing in the process of examining current conditions and likely future problems and coming to a decision about the most appropriate set of rules to be used to govern future interrelationships is obviously as much an investment decision as any

investment in physical infrastructure. The journal kept by Madison at the convention debating the new American Constitution continues to be a document that is carefully studied because it records the thinking of able individuals struggling with the problem of deciding upon a framework of rules for their own future (see also Dougherty, 2001).

The investment aspect of participating in the crafting of rules is thus far more obvious than the investment involved in the other three forms of social capital. For rules to be effective over time, however, continued investment in their articulation, clarification, and ensuring that they are followed must be made or they become simply rules-in-form and not rules-in-use.

All too many infrastructure projects paid for by donors in an effort to build economies in developing countries have failed for a lack of recognition of the importance of investing in institutions to complement the investment in physical infrastructure (E. Ostrom, 1999).

Using a norm of reciprocity and cooperating with others (at least until one learns that they are not using a norm of reciprocity) may happen without much conscious internal debate by those who hold strong norms. Learning the norm itself, however, comes about through a definite investment process made in making oneself the person that one wants to become. That is part of the central argument of V. Ostrom in Chapter 9 - focusing on the artisanship involved in shaping the artifact of the self. And, in many instances of using reciprocity, one is forgoing an immediate return for building a reputation of being trustworthy and cooperative and is thus likely to be chosen as a partner for future productive activities. Similarly, determining whether to extend trust to others involves calculation as to whether others are known to be trustworthy or are within institutional structures that make it worth their while to be trustworthy. Trust always involves a risk but it also involves building a longer-term relationship that can generate mutual gains over time.

The idea of investing in friendship in order to gain future economic benefits is, on the other hand, considered by many to be odious. Many recreational and friendship circles are viewed by participants strictly as consumption activities valued in and of themselves. The choice of using time with friends is self-conscious, but does not as often involve a self-conscious investment in an asset that can produce future benefits (but see Glaeser et al., 2000, for a model of self-conscious investment in all forms of social capital - including building a big Rolodex). There is little disagreement that an individual who has an extensive network of friends does reap a flow of future benefits from acts of friendship - many of them economic in nature. The investment is more often a by-product of a consumption activity rather than a clear-cut deferral of current consumption to invest in an asset for future benefits.

One cannot disagree that networks are frequently created and maintained as individuals engage in consumption activities together. Other forms of capital are also from time to time created as a by-product of other activities. Human capital is frequently built as a by-product of consumption activities. A person's enjoyment of swimming, for example, leads that person to undertake activities that are not only pleasurable today but also build physical strength and health that generate an important stream of future benefits. Even some forms of physical capital can be created as a by-product of having fun tinkering with various existing tools and discovering that one has inadvertently 'invented' a new tool.

5.2. Alienation

When one is asking whether an individual can 'sell' his or her social capital, one has to separate out the individual aspects of social capital and the relationship aspects. The reputation that a private firm has built for reliability, trustworthiness, and quality is one form of social capital that is definitely alienable. In accounting terms, this is the firm's 'goodwill', and it is given an economic value when assessing the value of the firm." An owner who sells a firm does not sell the network of suppliers and customers in which it is embedded as such. What it sells is its own reputation and the list of suppliers and customers with whom it has built multiple relationships through the years. The next owner can build on that social capital to establish an even more profitable enterprise, or run the good reputation of a former owner into the ground. Social capital can be destroyed very rapidly by a few untrustworthy actions!

It is important to note that physical capital cannot always be owned and alienated by individuals. When farmers build an irrigation system together using common-property institutions, they all own the system, but in many systems no farmer can sell his or her share.

Some noteworthy and successful counter examples are described in Chapter 12 where ownership in a farmer-managed irrigation system is as alienable as the holding of a stock in a modern private corporation. The point is not that shares to an infrastructure, such as irrigation systems, cannot be sold. Rather, the core point is that it takes the development of particular property right systems - as a form of social capital - to develop ways of buying and selling shares of large stocks of physical capital. Similarly, the extensive number of organizations and individuals who are connected to the Internet can sell their computer equipment to someone else, but no one can sell the Internet itself. There are many types of property rights to the use of physical capital where access rights to use physical capital can be bought and sold rather than the physical capital itself (see Schlager and Ostrom, 1992).

5.3. Measurement

The most frequent criticism of social capital is related to the lack of current agreement regarding the establishment of valid and reliable measures of it. Physical and human forms of capital are frequently measured by either the value withheld (cost) in producing the capital (properly discounted over time due to deterioration) or the flow of benefits generated. As mentioned above, the social capital of a private enterprise is routinely measured using standard accounting methods to determine the goodwill aspect of a firm's value. Veblen (1908a, 1908b) regards intangible assets, such as goodwill and technology, as capital in that they have the effect of generating income over time. The individualized aspect of social capital is frequently built into the charges that a lawyer or consultant can obtain from a client who needs access to both their human capital but frequently to their social capital as well. Even a family physician is dependent upon his or her relationships with local hospitals and with specialists and monetizes some aspects of these relationships in the charges made for patient care.

In principle, social capital can be measured within the context of collective-action problems. For example, when an individual returns a favor, there is an immediate cost to him (the differences in value between reciprocating and defecting). The reciprocating individual generates immediate benefits for self and for others; and if there is the opportunity for longer-term relationships, a small initial asset is also created. The value of the increase in social capital by this single reciprocating action is either the forgone immediate gain, or the gains accruing to oneself and others as a result of the current action of reciprocation (see Brosig, 2002; James, 2002). Data from extensive experimental studies are relevant to understanding what controlled conditions facilitate the building of social capital and the factors affecting the amount of investments made.

While several recently developed, formal models use this concept of social capital and its measurement (Annen, 2002a; Glaeser et al., 2000; James, 2002), many of the well-known measurements of social capital have taken a somewhat different form. One of the dominant ways of measuring one form of social capital - trust - is to use the responses of respondents to large-scale surveys of a population. Many standardized surveys, such as the GSS, the Monitoring the Future Survey, the World Values Survey, and the Eurobarometer, include questions that provide measures of trust and trustworthiness. Various empirical studies have been conducted utilizing these survey data to examine the causes and consequences of social trust (see, for example, Brehm and Rahn, 1997, Chapter 23 in this volume; Putnam, 2000).

While the aggregate measure of generalized trust and trustworthiness obtained by large scale surveys has frequently had a positive relationship with aggregated economic performance (Knack and Keefer, 1997, Chapter 20 in this volume), responses to these survey questions have not proved to be good predictors of individual cooperative behavior in experimental dilemma situations. Ahn et al. (2003) conducted a survey using the same questions that have repeatedly been used in the GSS and other national surveys, about one month before they recruited a subset of subjects to undertake a one-shot Prisoner's Dilemma (PD) experiment. Using a logit model, and regressing the decision to cooperate on dummy variables for game and player type, as well as the trust measure, yields no systematic significant coefficients for any of these classes of variables.

In an ambitious study of the relationship between responses to survey questions and behavior in an experimental setting, Glaeser et al. (2000) developed an extensive survey instrument that included ten of the general questions used in the various national surveys that have been a popular source of empirical studies of the impact of trust on economic performance. In the consequent experiments, the standard attitudinal questions generally did not predict subject choices when they were the first player in a trust game, but they

were more successful in predicting the amount of funds returned by a trustee in the same game. In other words, the general survey questions are better in predicting trustworthiness than trust. Further, they did find that measures of a respondent's past trusting behavior performed far better than the attitudinal question in predicting trusting behavior in the experiments. Thus, it would appear that while the general attitudinal measures are not robust with regard to individual level trust, they may be better at predicting individual and aggregate levels of trustworthiness. Further, survey questions have recently been developed that are more robust than those that have been used so heavily.

The other measure of social capital - used extensively by Putnam - is a census of the number of associations of various types that exist over time in a country. While little controversy exists that finding a decrease in the number of a particular type of association is an interesting and useful measure of the number of formal networks of a specific kind, the presumption that this is a good aggregate measure of social capital has been challenged. In an era of extensive networking via new modes of communication - in particular the Internet - no one has yet been able to establish whether the linkages formed in the workplace and over E-mail and the Web are as valuable a form of social capital as the large number of civic associations that have steadily faded from view.

There is no question that considerable controversy exists about the best way of measuring diverse forms of social capital, but it is exactly this kind of criticism that leads to the development of better measures over time (see Durlauf, forthcoming). Granted that at this moment of the concept's development, it may be even harder to measure social capital than physical or human capital, but the history of science has shown numerous cases in which a concept (such as an atom, a gene, and so on) was developed to address empirical puzzles without physical measurements of what was being posited to exist. It took decades, or even centuries, to develop the proper conceptual and technological advances to achieve reasonable measurements.

Social capital, with only a decade of history of empirical applications and attempts at measurement, does exhibit serious problems of measurement. But the concept is firmly placed in the context of major empirical and theoretical puzzles related to economic and political development. It would not be wise at all to dismiss the concept on the grounds that it is difficult to measure.

6. Concluding Remarks

The major purpose of this volume is to review the foundations for the fast-growing interest in the concept of social capital. We hope that reading the first two sections of this book will help scholars connect the more contemporary work (see Parts III, IV, and V) with earlier foundations (Parts I and II). We do recommend a critical reading of all the articles brought together in this volume. While we feel that each one is a valuable contribution to the social capital research paradigm, none can be considered the definitive work. Sufficient contradictions, measurement problems, and theoretical murkiness exist even among the major proponents of social capital that considerable future work is needed.

We are hopeful that considerably more research will be conducted on social capital and that it will take its place alongside the other two forms of human-made capital (physical and individual human capital), as well as that of natural capital (which we inherited from a long evolving biophysical world). Theoretically, it is important to establish basic causal relations among those factors that we have called the 'forms' of social capital. Of course, the causation need not be linear, monotonic, or unidirectional. Answering this question of causal relationships will help in solving the question of the exact conceptualization of social capital. We do need a clear understanding of what social capital is, what are its causes, and what are its results.

The concept of social capital has become a symbol for some scholars. It is not, however, by itself important unless it represents refined and accumulated knowledge. What is important, especially at this early moment of the concept's development, are the underlying ways of thinking. Unless the thoughts are well-developed, direct attempts at refining a definition will not advance knowledge. We need to incorporate and build a coherent framework to study economic and political outcomes. We hope the framework we have presented in the first part of this introduction is a stimulus to still further efforts.

That social capital, as a concept, acquires its analytical meaning primarily in relation to collective action is a growing consensus (not just our contention) among the leading contemporary contributors to this issue - despite substantial differences among them. Collective action and the factors related to it is where analytical

work needs to take off and through which ambiguities can be cleared, differences resolved, and more theoretically informed empirical studies conducted.

Notes

1. While we were writing this introduction, we became aware of several ambitious attempts to formalize the concept of social capital and its effects (see Annen, 2002a, 2002b; Henning, 2002).
2. The following section draws on Ostrom and Ann (2001), but is substantially revised.
3. Using one's own view of what one would do in a situation has repeatedly been found to be a good predictor of one's expectations about what someone else would do in that situation. In social dilemma situations, those that choose the more cooperative strategies usually have a higher expectation that others will also cooperate than those who do not cooperate (see Orbell, Schwartz-Shea, and Simmons, 1984; Orbell and Dawes, 1991).
4. For a more precise formalization of culture in this manner, see Ahn (2001). For an earlier discussion of the habits of the heart and mind, see de Tocqueville (1945) and V. Ostrom (1997).
5. Herman (1983: 557) noted in his discussion of the importance of legal systems that the 'legal ordering is itself a form of capital'.
6. Note that Coleman's seminal article on social capital (1988, Chapter 8 in this volume) is titled 'Social Capital in the Creation of Human Capital'. Also see Dasgupta's (2002, Chapter 15 in this volume) view that both human and social capital arise from externality.
7. Sobel (2002) stresses the important contribution that Jacobs makes to the understanding of trust.
8. Jacobs, in this volume, also discusses the roles of those individuals who occupy the weak-tie positions in transmitting information and organizing collective action.
9. Our review focuses on criticisms of social capital by neoclassical economists. Fine (2001) criticizes social capital from a Marxist perspective. He argues that the popularity of the social capital approach represents nothing but a latest attempt to expand a rational choice approach to all the areas of the social sciences.
10. Pierre Bourdieu's (1986: 245) definition of social capital stresses the purposive nature of it: 'Social capital is an attribute of an individual in a social context. One can acquire social capital through purposeful actions and can transform social capital into conventional economic gains. The ability to do so, however, depends on the nature of the social obligations, connections, and networks available to you.'
11. John R. Commons (1957) long ago recognized that a 'going concern' was composed of both the physical production facility as well as the team of individuals who made that facility productive. Physical capital without human and social capital cannot produce benefits.

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