Canada as Social Structure:
Social Network Analysis and Canadian Sociology

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English Abstract:

We review the social network approach to structural analysis, give a brief historical sketch of its development in Canada and abroad, and provide an overview of Canadian contributions to this field. We review research in the following areas: personal communities, computer supported social networks, social capital (social mobility, social support, social exchange), cultural capital, structural social psychology (social comparison and evaluation, attitude formation), collective action (mobilization for collective action and social movements, inter-and-intra movement dynamics), inter-organizational and class relations, and world systems. We discuss the core contributions of network scholars, challenges faced by network researchers, and make suggestions for future lines of inquiry. We conclude that while social network analysis is undoubtedly an international enterprise, Canadian scholars have made core contributions on a number of fronts over the past two decades.

French Abstract:

Nous examinons la façon d’aborder l’analyse structurelle qui fait appel au «réseau social», donnons un aperçu historique de son évolution au Canada aussi bien qu’à l’étranger et donnons une vue d’ensemble des contributions canadiennes dans ce domaine. Nous passons en revue la recherche dans les domaines suivants: communautés personnelles, réseaux sociaux assistés par ordinateurs, capital social (mobilité sociale, soutien social, échange social), le capital culturel, la psychologie structurelle sociale (comparaison et évaluation sociales, formation des attitudes), action collective (mobilisation en vue de l’action collective et mouvements sociaux, dynamique à l’intérieur des mouvements aussi bien qu’entre eux), relations entre les organisations et les classes, et les systèmes mondiaux. Nous discutons des principaux apports des spécialistes des réseaux, ainsi que des défis auxquels sont confrontés les
chercheurs dans ce domaine, et nous offrons des suggestions sur de futures avenues de recherche. Nous concluons que, bien que l’analyse des réseaux sociaux soit sans aucun doute une entreprise internationale, les spécialistes canadiens ont fait des apports fondamentaux sur un certain nombre de fronts au cours des deux dernières décennies.

CANADA AS SOCIAL STRUCTURE:

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Part 1: The Social Network Paradigm

1.1 Introduction

Although people often view the world in terms of groups (Freeman, 1992), they function in networks. In network societies: boundaries are more permeable, interactions are with diverse others, linkages switch between multiple networks, and hierarchies (when they exist) are flatter and more recursive. To be sure, social networks have always been with us, but we believe that they are increasingly supplanting traditional groups. The change from groups to networks can be seen at many levels. Trading and political blocs have lost their monolithic character in the world system (Friedmann, 1991; Frank, 1998). Organizations form complex networks of alliance and exchange rather than cartels, and workers (especially professionals, technical workers, and managers) report to multiple peers and superiors (Richardson, 1987; Carroll and Lewis, 1991). Management by network is replacing management by (two-way) matrix as well as management by hierarchal trees (Berkowitz, 1982; Wellman, 1988a, Castells, 1996).

The social network paradigm provides theoretical and methodological tools for comprehending the nature of contemporary societies. Not only was one of the first compendiums of case analyses largely produced in Canada (Wellman and Berkowitz, 1988), many Canadian scholars have produced important analyses in the past two decades. This review of recent Canadian work is organized into three parts. In this first part, we provide an overview of the social network approach to structural analysis, including a brief historical sketch of its development in Canada and abroad. Part 2 focuses on interpersonal networks, and Part 3 focuses on large scale networks.

1.1a A Social Structural Approach: Social network analysis is the study of social structure and its effects. It conceives of social structure as a social network, that is, a set of actors (nodes) and a set of relationships connecting pairs of these actors. The actors can be groups, organizations or even nation-states as well as persons, and the relationships are flows of resources that reflect relations of control, dependence, and cooperation. Network analysis’s core concern is to understand how social structures facilitate and constrain opportunities, behaviours, and cognitions. Network analysts investigate patterns of relationships that connect members of social systems, and how these patterns channel resources to specific locations in social structures. Their basic premise is that knowledge about the structure of social relationships enriches explanations based only on knowledge about the attributes of actors.

Social network analysts reason from whole to part, from structure to relation to individual, from ties to behaviour. The paradigm is explicitly anti-reductionistic, studying the parts of a system by analyzing relations among the parts. It is often multilevel, examining how larger level organizing principles affect individual outcomes, e.g., from structure to relation to individual (Wellman and Frank, 2001).

The social network paradigm provides ways for analysts to think about social relationships that do not occur in groups or in isolated two-person ties (dyads). A group is really a special form of a social network that is densely-knit (most nodes are directly connected) and tightly-bounded (most relations stay within the same subset of nodes). Instead of an either/or distinction between group membership and social isolation, researchers can bring to bear in their analysis a set of structural variables. Network analysts asks questions such as how dense, bounded, or clustered a network is; whether it is diversified or constricted in its size and heterogeneity; how narrowly specialized or broadly-based are its relationships; how do indirect connections and positions in networks affect behaviour; and what are the structural contexts within which relationships operate? Once this perspective is adopted, then it is clear that communities, organizations, and world-systems are social networks.

Social network analysis contrasts with psychologistic explanations that treat individuals as independent units-of-analysis and analyze behaviour in terms of psychological attributes such as values and attitudes. Social network data sets often include information about attributes, such as age, gender, ethnicity, and beliefs. However, network analysis does not treat social systems as the sum of individual attributes, but links attribute data with relational and structural data. Values, attitudes and norms develop and are embedded within a structural context - and it is the interplay between structure and culture that explains behavioural outcomes. Network analysts use ethnographic and statistical methods to investigate patterned differences in how people are linked to different kinds and amounts of resources. Clustering techniques find patterns of connectivity and cleavage, diffusion analyses trace and model the spread of information, block models identify actors in similar structural positions, and simulations model structural dynamics. Although social structures have powerful influences on people’s lives, network analysts have also focussed upon individuals as social agents: how people actively work to construct and maintain relationships and structures that help to sustain themselves in times of need and facilitate the creation of new opportunities.

Many network analysts study "whole networks", describing the overall structure of one or a few specified kinds of relations linking all of the members of a population (e.g., Nazer, 2001). Yet the open nature of developed Western societies preclude studying entire, bounded populations. Hence many network analysts study samples of "ego-centred networks" whose composition, structure and contents are defined from the standpoint of the individuals at their centres.

1.1b Development - Abroad and in Canada: The interdisciplinary enterprise of social network analysis has developed out of several research traditions, including:
• The birth of sociometry in the 1930s.
• Ethnographic efforts in the 1950s and 1960s to describe the nature of personal communities, social support, and social mobilization.
• Archival analysis to understand the structure of interorganizational and international ties.
• Political economic analyses using a range of techniques to analyze social movements and world systems.

Since the 1960s, social network analysis has developed from a metaphor into a paradigm, with a common set of research questions, specialized ways of collecting data, and powerful methods for analyzing these data. Social network analysts have a 500-member international society (founded and based in Toronto 1976-1988; http://www.heinz.cmu.edu/project/INSNA/), three journals, and an annual midwinter meeting (in a warm climate - insisted on by Canadian members). Canadians have been leaders in developing the network paradigm. Indeed, our account builds on an article reviewing Canadian network accomplishments through the early 1980s (Richardson and Wellman, 1985) and an influential Canadian-edited compendium (Wellman and Berkowitz, 1988). Although our article emphasizes work by Canadian sociologists, social network analysis is an international and interdisciplinary undertaking, albeit one in which Canadians have played leading roles.

Before World War II, Canadian psychologists Edward (Ned) and Helen McMurchie Bott, the founders of the University of Toronto Department of Psychology and the Institute for Child Study, did some of the earliest network analyses (Freeman and Wellman, 1996). Helen Bott's analysis of play in a nursery school (1928) was the first to collect systematic data about personal networks - an individual's set of ties - and to use a matrix to organize data about who did what with whom. The Botts' daughter, Elizabeth Bott, grew up to write (in England) the earliest well-known network analysis, showing that interdependence or separation among husbands and wives was more a function of the strength of their kinship networks than of their class position (1957).

The development of social network analysis within Canada can itself be partially explained in terms of networks (Wellman, 1993, 2000b). There has been a "chain migration" process. Many scholars were trained by Harrison White and Charles Tilly at Harvard (Tilly also taught at the University of Toronto from 1966-1969), and almost all obtained jobs at the University of Toronto. Later generations of network analysts subsequently trained at the University of Toronto and elsewhere, and dispersed across Canada, and to some extent in the United States and France (Hiscott, 1983). Several institutions have served as important nodes in the network analytic network including: Laval University, University of Montreal, University of Toronto, McMaster University, Brock University, University of Calgary, University of Alberta, University of British Columbia, and the University of Victoria.

The rise of the network analytic perspective to prominence in Canadian sociology is no accident. Canadian sociologists are apt to view the social world in structural terms. Network analysis readily lends itself to intergroup, interregional, and international issues central to debates about Canadian society and its place in a larger global system. Its approach is well-suited to the patterns of dependency relations that have emerged both within Canada (e.g., Central Canada vs. the West; Brym, 1986) and between Canada and more powerful imperial powers (e.g., first Britain and France, and then later the United States; Brym with Fox, 1989). By contrast, American social scientists at the imperial centre have tended to ignore the links of power that bind others to them and celebrate others' allegiance as the result of the perceived greatness of their own society (Bush, 2001).

Structural differences between Canada and the United States have influenced values and the ideological climate of the respective nations: American individualism and Canadian collectivism (Lipset, 1990). Themselves members of a dominated society, Canadians are less apt to see the world as composed of voluntarily-chosen, egalitarian, symmetrical ties, and are more apt to study how asymmetric ties unevenly distribute resources in complex hierarchical structures of power and dependency. This brings analytic precision to the perennial preoccupation with relations between core and periphery (e.g., Friedmann, 1988).

Canadian network analysts have actualized this sensibility in a variety of ways, discussed in Parts 2 and 3. At the core has been theory-construction and method-building, briefly noted here. Lemieux (1982), Wellman (1988a, 1999b) and Erickson (2000b) have written theoretical treatises. François Lorrain (1995; Lorrain and White, 1971) developed the key concept of "structural equivalence" - people with similar role relations to others may have similar positions in social structures even if they are not part of the same group. William Richards and Andrew Seary (1997, 2000) have developed eigen analysis methods for elucidating network structure. Richards has also built two computer programs for studying networks. Negopy (Richards, 1995) discovers structural properties of a network; Multinet (Richards, 1994), enables analysts to relate structural data to data about individual attributes (gender, age, etc.). With the abundance of ways of measuring networks available, Dean Behrens (1997a) has found that tie-level and network-level methods of eliciting data affect the kinds of clustered groups that will be found and the predictive ability of these clusters on behaviour. He is also the lead author of a computer program that partitions individuals or organizations into groups based on their relationships with each other (Behrens et al., 1990).

Canadian network analysis also incorporates the national concern for how technology connects our dispersed, diverse land: from state sponsorship of voyageurs to the Internet. This follows the lead of Harold Innis who moved away from analyzing individual phenomena such as the fur trade (1930s) and the cod fisheries (1940) in isolation and emphasized the importance of understanding them in the context of trade, power and communications networks (Innis, 1950). Building upon this sensibility, a political economic approach developed, relating the emergence of local phenomena to relations of power and dependency between different geopolitical units and corporate structures. Important practitioners include: Marchak (1983, 1991), Clement (1975, 1977, 1983; Clement and Myles 1994), Laxer (1989, 1991), and Carroll (1986). Although such scholars rarely call themselves network analysts, their reliance on structural analysis is congruent with the social network paradigm.

1.2 Some General Principles of Social Network Analysis(2)
function of socio-economic status, ethnic identity, age, and so on. Mainstream sociologists now take structural contexts seriously.

Yet, standard methodological techniques such as the social survey, and regression analysis still treat individuals as discrete units of analysis. Although surveys and regression analyses are frequently used by network analysts (Müller, Wellman and Marin, 1999), they also use different types of techniques to describe and analyze social structure. New techniques have been developed in sampling (e.g., Erickson et al., 1981, Erickson and Nosanchuk, 1983), questionnaire construction (e.g., Marsden, 1990), structural analysis (Richards and Seary, 1997, 2000; Behrens, 1997a), and statistical analysis (e.g., White et al. 1976; Berkowitz and Fitzgerald, 1995) that allow researchers to map and interpret patterns of interrelations amongst social units.

1.2b Values, Attitudes, and Norms Emerge from Location in Structural Systems of Social Relationships: Social network analysts do not start with the assumption that norms, values, and attitudes are a primary force in guiding behaviour (Wellman, 1988a). Nor do they assume that high levels of social solidarity and shared norms are the baseline state of society -- or that the absence of these conditions is an indication of social pathology. Rather, social network analysts direct their attention toward the types of structures in which individuals are embedded, and argue that these are more important for understanding attitudes and related phenomena than are individual attributes (Erickson, 1988). For example, Baron and Tindall (1993) studied members of a punk rock subculture, many of whom lived on the streets. They found that subculture members with the highest levels of network centrality, were more likely to hold delinquent attitudes (attitudes advocating delinquent behaviour) than were peripheral members of the subculture. Thus attitudes were a function of structural location.

1.2c Social Structures Determine the Operation of Dyadic Relationships: Network analysis has shown that exchanges between two individuals do not operate in isolation but depend on relationships with and among alters (Cook, 1982; Wellman, 1988a). Although network analysts study dyads, triads, and other micro-structural forms, a central tenet is that dyads are themselves embedded in social structures that have consequences for interpersonal processes. For example, the nature of indirect ties (friends of friends) can influence the flow of information for important processes - such as getting a job (Granovetter, 1973, Lin, 1999). In the area of communities and social support, researchers have found that the composition of a network affects the kinds of support found in it (Wellman and Frank, 2001).

1.2d Social Systems are Networks of Networks: Social systems are networks of networks, and not necessarily groups defined a priori. Thinking of social systems as networks of network facilitates understanding different levels of phenomena. Individuals interacting in microstructures, are embedded in meso-level structures, which in turn are linked to macro level structures. For example, in the area of social movements, the rise of a social movement depends in part upon the political opportunities provided by agents and opportunities (Tilly, 1978). Within a movement, structurally more central organizations will have more influence. At the level of the individual, those with greater network centrality (the number of ties they have to other movement participants) are more likely to become recruited for movement participation (Tindall, 1994). Sets of individuals with overlapping social movement organization memberships are by definition more integrated, and their greater integration has consequences for individual level outcomes (such as access to diverse information). Members of dyads constituted by overlapping memberships also serve as bridges at the meso level connecting different social movement organizations.

1.2e Social Network Analysis is Based Upon General Principles: Post-modernism (and its softer "cultural studies" version) has become important in Canadian sociology. Post-modernists emphasize the social construction of structures and processes. Knowledge is seen as being a function of the history and social location of the observer. Denying the possibility of generalizing, leads post-modernists to be sceptical about the value of systematic investigation, and about the possibility of general, objective or formal explanation (Ritzer, 1997).

There are affinities between postmodernism and network analysis. Like postmodernists, many network analysts state loosely-coupled propositions rather than building grand theories (Wellman, 1994). The mode of postmodern discourse is congruent with the basic network analytic insight that the world is composed of networks, and that hierarchically-organized, bounded groups are only one, somewhat rare, type of network.

By contrast to post-modernism, social network analysts adopt a realist ontology, viewing social structures as real entities (Keat and Urry, 1982). Where post-modernists provide "accounts"; network scholars provide "analyses". They see patterns of multiple ongoing relationships as having real consequences for resource flows, and for providing opportunities and constraints for social behaviour (Wellman, 1988a, 1994). Network analysis is an inherently generalizing enterprise. Analysts want to tease out the structural patterns that underlie the surface noise of social systems and use knowledge of these patterns to understand social interaction. They adhere to the possibility of objectivism in principle even if they recognize the challenges to this ambition in practice. They contend that while social structures are cognitively interpreted and imaged by agents, they cannot be reduced to social constructions.

Social network analysis is reflexive. In accordance with mainstream science, social network analysts view knowledge as provisional, and measurement as being subject to error (Bernard et al., 1984, Killworth et al., 1990, Marsden and Campbell, 1984). They believe that social structures can be objectively mapped (in the sense that such analyses are based on measures that can be intersubjectively agreed upon). They see social structure as being related to power, but in contrast to many post-modern accounts, they see their own conceptions about structure as being more than fictional outcomes of value systems.

Part 2: Interpersonal Networks

2.1 A Group is a Type of Social Network

Many social network analyses do not treat formal group boundaries as truly social boundaries, be they departments in organizations or neighbourhoods in cities. Instead they trace the social relationships of those they are studying, wherever these relationships go and whomever they are with. Only then do network analysts look to see if such relationships actually cross formal group boundaries. In this way, membership and boundaries become important analytic variables rather than a priori analytic constraints. The pattern of relationships becomes a research question rather than a given.

A group is only one kind of a social network, one whose ties are tightly-bounded within a delimited set and are densely-knit (most
network members are directly linked with each other). To be sure, there are densely-knit and tightly-bounded work groups and community groups. Yet there are other kinds of work and community networks whose relationships are sparsely-knit with only a minority of members of the workplace or community directly linked. These relationships tend to ramify out in many directions like an expanding spider’s web rather than curling back on themselves into a densely-knit tangle.

2.2 Communities Are Networks

2.2a Searching for Community: scholars, the public and policymakers have traditionally seen communities as densely-knit solidarities with tight boundaries, although there was more fragmentation, mobility and permeability in the past than many have acknowledged (Wetherell, Plakans, and Wellman, 1994; Wellman and Wetherell, 1996). Densely-knit networks with tight boundaries make it easy for communities to control their members and coordinate their behaviour (Tindall, Kay and Bates, 1999; Wellman, 1999a).

Armed with a social network approach to posing intellectual questions, gathering information, and analyzing data, researchers are no longer restricted to searching for communities in the solidarities of neighbourhoods and kinship groups. Some have used network tools to inform studies of small towns (Lemieux, Joubert and Fortin 1981; Gold 1985) and hunter-gather bands (Howell, 1988). Bodemann (1988) documented how cleavage and change in a seemingly-traditional Sicilian village has been affected by access to capital and information from outside: links to Christian Democratic Party and more affluent returning workers from northern Europe. Similarly, Pasternak and Salaff (1993) found that ethnicity, occupation and links to the Chinese Communist Party structured cleavages and coalitions in Inner Mongolia.

2.2b Finding Community Beyond Neighbourhoods: Others have used network tools to show that residential, kinship and co-worker communities have not been lost under the impact of contemporary social transformations nor saved in village-like neighbourhoods. They have discovered other forms of community - sparsely-knit and spatially-dispersed- and other forms of organization - loosely-coupled and fragmented. Thus Salaff and associates (1981, 1988, 1991; Sheridan and Salaff, 1984; Pasternak and Salaff, 1993) have shown how economic development in Hong Kong, Singapore, and Inner Mongolia has made family and kinship relations more complex. More education draws social contacts away from ascriptive bases of trust (e.g., kinship) more broadly towards buddies and colleagues who share interests and have shared economic and educational experiences. Family members can help lend money or provide moral support, but better-educated Chinese who are seeking jobs, starting businesses, or contemplating migration cannot get sufficient help from kin. Closer to home, Corman, et al. (1993) have shown how husband-wife relations and relations among wives are intertwined with Hamilton steelworkers' communities of support (see also Luxton and Corman, 2001). In the Indian steelworking city of Bihar, Howard (1988) found complex patron-client relations as workers in small shops are more competitive for the bosses' favours than workers in large factories.

Network analysts have usually found that community has moved out of its traditional neighbourhood base as the constraints of space weakened (Langlois, 1990; Wellman, 1988b, 1999b). Few socially-close ties are within neighbourhoods. People use telephones, the Internet, cars and planes to maintain far-flung, supportive relationships (Wellman, et al., 1997). This is not to say that communities have totally cut in the solidarities of neighbourhoods and kinship groups. Some have used network tools to pose questions of small towns (Lemieux, Joubert and Fortin 1981; Gold 1985) and hunter-gather bands (Howell, 1988). Bodemann (1988) documented how cleavage and change in a seemingly-traditional Sicilian village has been affected by access to capital and information from outside: links to Christian Democratic Party and more affluent returning workers from northern Europe. Similarly, Pasternak and Salaff (1993) found that ethnicity, occupation and links to the Chinese Communist Party structured cleavages and coalitions in Inner Mongolia.

2.3 Computer Supported Social Networks

Computer networks are social networks. Although early studies treated computer networks as privileged, isolated entities (e.g., Sproull and Kiesler, 1991), Toronto-based network analysts have shown how online connectivity fits into the overall context of work and community. The data came from dispersed workgroups, home-based teleworkers, residents of a highly-wired Toronto suburb ("Netville"), and large-scale samples of North American Internet users (Haythornthwaite and Wellman, 1998; Salaff, Wellman and Dimitrova, 1998; Hampton and Wellman, 1999, 2000, 2001; Hampton, 1999, 2001; Wellman, et al., 2001; Koku, Nazer and Wellman, 2001; Nazer, 2001). Addressing fears that the Internet will lead to social isolation, researchers have shown that the Internet actually adds to the total amount of communication (Gold, 1998; Wellman et al., 2001), helping to fill in the gaps between in-person meetings as well as to arrange such meetings. Even the allegedly-global Internet is, in reality, "glocalized": heavily used for local interactions and rooting people to their office or home computers (Hampton and Wellman, 1999, 2000b; Hampton, 2001).

Nor is Internet communication constricting. Where there had been early fears that the limited "social presence" of electronic communication would confine it to narrow instrumental exchanges, all sorts of things are communicated on-line, both at work and in the community. Even at work, friendship as well as shared tasks drive online communication[3].

Thus the Internet is conservative in some ways, as people appropriate the technology for their existing needs just as they have done with the telephone. But just as the telephone led to more fragmented and geographically-dispersed personal networks (Wellman and Tindall, 1993), the Internet is affecting the structure of community and society. Computer networks increase the size, variety of interpersonal ties, and they are especially useful for maintaining weak ties in between face-to-face encounters (Wellman and Gulia, 1999a). The growing reliance on personal computers, wireless computing, and mobile phones/pagers for connectivity is affording a societal shift towards networked individualism: greater privatization of community, as contact among individuals supplants contact among households and communal groups (Wellman, 2000a, 2001a). The Internet supports flexible work practices, as traditional bureaucratic organizations are replaced by often-transitory virtual organizations and networked organizations. In such work practices, people belong to multiple work teams that stretch across departments and even organizations, see teams rapidly form and dissolve, and have only partial commitments to each team, and have multiple reports to/from superiors, peers, and subordinates (Wellman, 1997; Koku, Nazer, and Wellman, 2001; Nazer, 2001).

2.4 Social Capital

2.4a Social Capital is a Network Phenomenon: When people need help, they can either buy it, trade for it, steal it, get it from governments and charities, or obtain it through social capital: their useful interpersonal ties with friends, relatives, neighbors and workmates. Social capital facilitates productive and reproductive activity, just as physical capital and human capital do. It strengthens bonds while providing needed resources.

Although social capital analysis has become a lively international enterprise (e.g., Bourdieu 1983/1986, 1984; Portes, 1998; and Putnam, 2000), it is a sprawling term, ranging from an individualistic framework that emphasizes the advantages that individuals can gain through their personal networks to a collective perspective that emphasizes the advantages to a community of volunteerism (Coleman 1988; Paxton 1999; Putnam 2000; Lin 1999, 2001). It includes things such as community norms, group solidarity, and participation in voluntary and civil organizations. The loosely-coupled, networked nature of contemporary societies means that social capital comes contingently from a variety of persons, ties and networks, rather than stably from a single, solidary group (Erickson, 1996a; Wellman 1999a). At times the network, rather than the tie, is key to the provision of social capital. Large, diversified networks often provide more support than small homogeneous networks (Haines and Hurlbert, 1992). For example, large, diversified networks lead people to use alternative forms of health care (such as chiropractic, Alexander technique, acupuncture) in addition to official doctor-hospital care. Network characteristics and not individual attributes such as socioeconomic status or gender, are the prominent indicators of using complementary and alternative care (Kelner, 2001; Beverley Wellman, 1995, 2001; Kelner and Wellman, 1997a, 1997b).

Canadians have generally analyzed social capital with respect to resources available and mobilizable in social networks. They have wondered about the types of networks people are embedded within, and the factors that explain these structures - such as initial statuses, and education. They have analyzed how people mobilize their social capital, using relationships to obtain resources such as information. They see social networks as flexible, efficient, available, and custom tailored sources of social capital that are low in financial cost. For society, social capital conveys resources, confirms identity, influences behaviour, and reinforces integrative links between individuals, households and groups.

2.4b Social Capital and Mobility: Social capital facilitates and constrains social and geographical mobility. In a study of blue-collar workers, Wilkinson and Robinson (2000) showed that ties with friends and relatives were crucial for Elliot Lake (Ontario) workers to obtain new jobs. Friends contributed much more information than relatives, but relatives provided more of "clerical help" in filling out forms and dealing with bureaucracies. Friends, both strongly and weakly tied to the job seekers, provided more useful job contacts than did relatives. In a study of decidedly white-collar workers, Kay and Hagan (1999) showed that while female lawyers in Ontario participated fully in the accumulation of social capital in law firms, their efforts resulted in reduced probabilities of partnership. Women had their worst partnership prospects in small firms that were less apt to modify gender-related work roles (Hagan, et al., 1991; see also Arnold and Kay, 1995). Paralleling Kay and Hagan's findings, Tindall (1995) has observed that having greater network range (network diversity) is more important for facilitating political participation among men than women. The question remains open as regarding opportunities for women in corporate board rooms. The proportion of women directors is increasing (Hughes, 2000), but it is not clear if their roles and power are similar to what has been obtained by male directors.

Networks are often crucial for geographical mobility. The presence of kin and friends often determined whether Hong Kong, Taiwan and Chinese immigrants made Canada their destination. Network members provided money for the move, entree to jobs and know-how in Canada, although some affluent migrants eschewed network help to avoid incurring reciprocal obligations (Salaff, 1998; Salaff and Wong, 1994; Salaff, Fong and Wong, 1999). Once immigrants arrived, their networks helped situate them in the social system, with friendship ties to higher-status ethnic groups paying off in higher income (Ooka and Wellman, 2001).

2.4c Social Capital and Social Support: Canadians have pioneered the systematic study of social support in networks (Tilly, 1969; Shulman, 1975, 1976; Wellman, 1982, 1993). They have shown that network capital, the form of social capital that makes resources available through interpersonal ties, is widely available, usually specialized, and unevenly distributed among people, ties and networks. Network members provide emotional aid, material aid, information, companionship, and a sense of belonging. Their social support is one of the main ways that households obtain resources to deal with daily life, seize opportunities, and reduce uncertainties.

Support is important not only in fragmented westernized societies but in centralized bureaucratic ones. Under communism and post-communism, Bulgarians (Radoeva, 1993), Hungarians (Silk and Wellman, 1999), and Chinese (Wellman, 2001b) have relied extensively on their interpersonal networks to obtain material resources in times of scarcity. Their networks have provided flexible work-arounds to bureaucratic rigidities, for everyone from city-dwellers obtaining food from peasant relatives, to home-builders helping each other in construction, to job-seekers, to managers of large enterprises in dire need of goods and services.

Support from interpersonal ties is specialized: Friends and siblings provide companionship, parents and adult children provide large services and financial aid, and neighbours and workmates provide small services (Wellman, 1979; Wellman and Wortley, 1989, 1990). Yet the composition and structure of networks also affects the provision of support (Wellman and Gulia, 1999b; Wellman and
Frank, 2001). The greater the range of a person's network - the more network members and the more diverse their characteristics - the greater the number and percentage of people in a network that provide support. The more densely-knit the network, the more supportive. Thus size, diversity and coordination all are useful for getting support, and those who inhabit large networks are triply fortunate: Not only do they have more ties and get more overall support, each member of their network is more apt to be supportive.

Behrens's (1997b) study of the supporters of people with the HIV virus showed both the specialization of ties and the interplay between tie and network dynamics. Ties that provided companionship and emotional support lasted longer than those that provided instrumental support. Ties with people in densely-knit networks were more likely to persist. People with HIV constantly re-examined their ties in terms of the kinds of support provided and the quality of this support. Over time, the threshold of acceptable interactions was raised, and those ties that did not meet the current threshold were distanced and eventually terminated. The shortest lived ties were those that drained emotional support, but at times these were so embedded in densely-knit networks that they persisted regardless.

Just as networks are crucially supportive in everyday life and the chronic crisis of HIV, they are important in the short-term crises of a hurricane (Beggs, Haines and Hurlbert, 1996b; Beggs, Hurlbert and Haines, 1996; Hurlbert, Haines and Beggs, 2000). The supportive relationships forged in everyday life condition relational experiences that created expectations for help in when the hurricane came. Networks were more supportive in dealing with the hurricane when they were densely-knit and gender-diverse with relatively high percentages of kin, men and younger adults. The characteristics of those receiving the support (such as their race) and the nature of their residential communities also affected the support received. Such networks operated in conjunction with institutional support. Networks and institutions complemented each other, for institutions tended to aid those whose sparsely-knit and diverse networks provided less support.

For decades, methodological limitations necessitated separate analyses of ties and networks (Wellman et al., 1991). Now, multilevel analyses of network capital integrate analyses of individuals, interpersonal ties, and personal networks into a single regression model. Wellman and Frank (2001), using data from the same Toronto samples studied earlier by Wellman and his colleagues (e.g., Wellman et al., 1988; Wellman and Wortley, 1990), have shown that while tie characteristics are key predictors of supportive behavior, networks also affect the supportive behavior of ties and individuals. Ties are more supportive when they are operate in networks heavily composed of similar ties. For example, parents and adult children are more supportive in networks containing high percentages of parents and children. Moreover, reciprocity is more than tie-deep, for when two people are linked in the network, they are more likely to support each other. Thus individual agency, dyadic relationships, and network properties are all implicated in the provision of social support.

2.4d Exchange and Reciprocity: Norms and practices of social exchange and reciprocity increase the volume and predictability of social capital (Deroy, 1997, 2000; Wellman, 1992b). For example, New France was built in the seventeenth century from a complex web of exchanges between government officials and welfare-minded clergy in Quebec and France (Deroy, 1996; Deroy-Pineau and Bernard, 1998). In Toronto, exchange is both dyadic and network-based. Not only do people exchange the same things (such as "tit-for-tat" exchanges of emotional support) and different things ("tit-for-tat" exchanges of services for emotional support), but their exchanges often are indirect, passing through others in the network ("tit-for-tat-for-tut" exchanges of emotional support for services for companionship; Wellman et al., 1988; Wellman and Nazer, 1995: Wellman and Frank, 2001). It is important to ascertain the base rate for reciprocated exchanges due solely to chance, and the extent to which the provision of a supportive resource is related to previous exchanges (Behrens and Wellman, 2001).

New forms of exchange are developing. Communities around the world are experimenting with local money systems, such as LETS, a mutual-credit accounting money, and HOURS, paper notes representing labour hours. These are "complementary" currencies, intended to strengthen local economies without replacing the national currency. Yet tension has arisen over monetizing women's unpaid work that is conventionally conceived of as a gift: free and abundant. Pricing such "gift" labour with conventional money has been thought to draw it into the commodity realm and make it scarce. In money systems such as LETS, the unit of exchange is non-scarce, and the gendered dichotomy of commodity and gift loses its force (Raddon, 2000).

2.5 Cultural Capital

Networks can build cultural capital - the range of people's useful cultural knowledge - by increasing the variety of information that people have (Bourdieu, 1984; Erickson, 1991, 2001a, forthcoming). Advantaged people often have better cultural resources, not because of social their class as such but because of their diverse networks. Erickson (1996a) asked workers in the Toronto private security industry if they knew people in each of 19 categories inspired by Wright's (1985) three major class dimensions: control of property, control of organizations, and control of skill. To measure cultural capital, they were asked if they were familiar with a list of specific items within five genres (books, restaurants, art, magazines, and sports); for example, had they heard of or read each of 13 books. People in higher class locations had more diverse friendship networks. Weak ties were especially important in affording greater access to a variety of classes. Network diversity was the only source of cultural capital advantage for all five genres studied after demographic and social class variables were controlled (see also Erickson, Albanese and Drakulic, 2000).

2.6 Structural Social Psychology

2.6a Social Comparison and Evaluation: Network analysis can be a common frame of reference for studies of reference groups, social comparison, class consciousness, equity and justice, and relative deprivation (Gartrell, 1987). On the one hand, networks limit social evaluation as they constrain personal reference points. Choices of whom to compare with are made from available alters and upon particular motives for comparison (e.g., learning, self-enhancement, ego-defence, etc.). On the other hand, actors are active agents: Their interactions in the process of social comparison can alter the existing network structure.

The choices of whom to make comparisons with are usually not free but are constrained by impersonally determined opportunities to interact (Erickson, 1988; see also Erickson, 1982; Erickson and Nosanchuk 1984, 1998; Gartrell, 2001). The social structuring of
activity - in "foci" such as workplaces, kinship groups, and schools - leads people to develop relationships with others who are similar to themselves (Feld 1981, 1982)

Erickson and Nosanchuk (1984, 1998; Nosanchuk and Erickson, 1985) studied social comparisons within a bounded network, members of an Ottawa-Hull contract bridge club. They found that comparative stereotyping is not reduced by contact. Indeed, greater involvement in the bridge subculture increased stereotyping because participants noticed the inequality of a tiny elite and ignored the equality of the much larger majority. Comparisons tended to be upward to those of cumulatively greater bridge playing ability. However, the degree of upward comparison depended upon the motive for comparison. Information seeking led to the greatest degree of upward comparison, ego enhancement was lower, and ego defence the lowest.

Do people compare themselves to specific individuals or a symbolic group (Gartrell, 1987)? Although theories of distributive justice have emphasized the relational nature of justice evaluations, actual research has treated justice sentiments as the aggregated attributes of individuals (Gartrell, 1985; see Jasso, 1978, 1980; Jasso and Rossi, 1977). Yet such aggregate approaches mask the social relational properties of sentiments of collective justice about wage structures. Justice evaluations may be reciprocal, multiple reference points exist, and multiple justice sentiments may coexist. Gartrell (1985) has studied evaluations of the fairness of pay differentials amongst blue collar workers in a public works department by using block models to depict the structure of justice evaluations. He showed that blockmodelling provides a more valid representation of the data than do predictions yielded by the dominant aggregate model (proposed by Jasso, 1978, 1980).

2.6b Attitude Formation: Attitudes are "made, maintained, or modified primarily through interpersonal processes" (Erickson, 988:99). These processes have little affect among strangers, but rather, occur through social networks. Erickson has suggested how three types of network structure can affect attitudes.

1. "Clique models" stress the identification of sets of people more densely tied to one another than to other people in their network, where density is the proportion of all possible ties that actually exist (Erickson 1988:106). Cliques engender similar attitudes. People compare most often, and such comparisons are most informative, with people to whom they are directly connected. Cliques with stronger and more broadly-based ("multiplex") ties should have greater consensus on attitudes.

2. Where clique analysis asks whether people belong to the same dense subgroup, structural equivalence asks the question to what extent do people occupy similar types of positions within the network. "Structurally equivalent people tend to have similar attitudes because they tend to interact with the same types of actors in the same way" (Erickson 1985:110). They tend to make social comparisons with the same types of alters. While a pair of structural equivalent actors should have similar attitudes, such similarity does not depend on direct comparison with each other.

3. Spatial models draw upon the metaphor of geometry to depict individuals in social space so that spatial closeness corresponds to closeness of relationships. The closer the relationships, the more similar the attitudes are likely to be.

In sum, social network approaches such as blockmodelling (as discussed by Erickson, and demonstrated by Gartrell) provide insights into social structure, and can demonstrate how similar processes operate across different types of organizations. They provide a structural alternative to the "aggregate and attribute data" analyses common to social psychology, and can provide more realistic models of the social referents that people draw upon in making social evaluations. Erickson has talked about how other structural analytic conceptual models have different implications for attitude formation (e.g., clique, blockmodel, and spatial analyses). There is a need to do more empirical research on these processes to see which types of models work best for predicting and explaining attitude formation.

Part 3: Large-Scale Networks

3.1 Collective Action

3.1a Societal Breakdown and Collective Behaviour: Classical sociological thought about people's participation in mass movements explained such behaviour as resulting from alienation and anomie. Theorists argued industrialization and urbanization led to a lack of primary groups and secondary associations to integrate individuals in societies (Brym, 1998). Protest behaviour was seen to be a result of "contagion" and as largely being irrational in nature. In recent decades these ideas have been systematically debunked (Tindall, Kay, and Bates, 1999). Social movement researchers have demonstrated a rational basis for most protest behaviour. Participants in collective actions tend to be more integrated through their personal networks and better connected to societal institutions than non-participants (Tindall, 2000b). Most scholars of social movements recognize that network ties are essential for recruitment and mobilization (Tindall 2000b). Analysts have emphasized the ways in which certain social structures act as cleavages between groups, while other social structures serve to integrate individuals within a group.

Some scholars have been concerned in recent years with bringing cultural analyses back into studies of social movements (Snow et al., 1986, Snow and Benford, 1988). Several researchers have examined the connection between structure and culture by examining the relation of structural position to cultural framing and collective identity. Carroll and Ratner (1996, 2000) have shown how cognitive framings of social justice issues are related to positions within inter-movement networks. Activists who invoked a political economy injustice frame were more likely to be embedded in cross-movement linkages than were others. Those who framed injustice in identity-politics terms were less embedded in cross-movement ties and were more likely to be "localists".

3.1b Connectivity and Cleavage: Brym has built on the social movement analyses of McPherson (1953), Lipset (1968), Tilly (1984), and Pinard (1973) to develop a model of third party formation (Brym 1978, 1979, 1984, Brym with Fox 1989). Canadian third parties have tended to emerge where disadvantaged groups are: bound together in dense social networks, highly socially polarized from advantaged groups, and relatively unrepresented by existing parties. Protest activity is a function of the protesting group's potential power. The power of a containing group depends on: (1) The group's access to material resources
Position within a network affects both the real and perceived effectiveness of a social movement organization. For example, the structural positions of 29 organizations within the Canadian feminist movement were a highly significant predictor of how outsiders perceived an organization’s effectiveness (Phillips, 1991).

Although there has been a good deal of research on the mobilization of social movements themselves, there has been a dearth of research on the dance between movement and countermovement. Meyer and Staggenborg (1996) have analyzed the conditions under which countermovements develop in relation to movements. Their analysis of political opportunities suggested that transformations in the political landscape make movement activities potentially effective for creating or resisting social change. They have suggested:

- Movement-countermovement conflicts are most likely to emerge and endure in states with divided governmental authority.
- Opposing movements develop isomorphic organizational structures to the degree that they engage politically in the same venues.
- Interactions between opposing movements prevent the complete institutionalization of tactics by either side.
- Conflict between opposing movements exacerbates intramovement battles over collective action frames.

**3.1c Personal Networks and Mobilization:** Networks do not directly cause collective action to occur. Rather, network structures condition the nature of interpersonal interaction, influence, and resource flows amongst potential participants. For example, several network-based processes in a British Columbia environmental movement mediated the relationship between personal network structure and the social movement participation of individuals: being the target of recruitment efforts, communicating frequently with others about movement issues, and strongly identifying with the movement (Tindall, 1994, 2000b). Under conditions of activism with low costs and risks, weaker ties were more important than stronger ties for facilitating participation. A longitudinal study of participants in this movement found that network integration, communication about movement issues, and level of movement identification declined over time (Tindall 2000a). This was explained by position within the cycle of protest and the biographical availability of participants.

Paralleling Putnam’s (1993, 2000) argument that participation in any voluntary organization increases political mobilization, Erickson and Nosanchuk (1990) analyzed why associational membership politicizes bridge players. Only political discussion among the participants mobilized political participation. If bridge players, especially peripheral participants, had friends in the club who talked politics, they did so more themselves.

Collective action is inherently problematic because decisions about individual contributions usually involve the social dilemma of being forced to choose between self-interest and collective interest. Tindall and Gartrell (1990) have bridged research on collective dilemmas and justice theory by examining the role played in reactions to others’ free riding. People become aware of others’ contributions and outcomes as a by-product of interaction in social networks. The volume, strength, and proximity of ties are all important. For example, people are more likely to cooperate in smaller groups or smaller network segments because they are less anonymous and their behaviour is more easily monitored. The division of larger networks into smaller cliques facilitates monitoring. Without trust, cooperation among persons facing a social dilemma will deteriorate. Strong ties foster trust. Yet little has been said about the possible dysfunctions of network properties for social dilemmas. Trust also presents enhanced opportunities for malfeasance.

Almost all research on networks and micromobilization has focussed on progressive social movements or instances of local collective action. Less is known about the structure of personal networks among those who participate in countermovements and if similar network processes are at work. Theoretical predictions have argued that individuals who have ties to opposing groups will moderate their participation in a social movement (McAdam and Paulsen, 1993). However, a study of a community countermovement organization in Port Alberni, B.C. that mobilized against the provincial environmental movement found that the number of outgroup ties (the range of ties to environmental organizations) held by individuals was the strongest predictor of countermovement activism amongst countermovement members (Tindall and Mauboules, 2000).

Most studies of networks and micromobilization have analyzed communication that occurs face-to-face, through the post mail, or over the phone. A recent study of Internet communication and collective action in a “wired” Toronto suburb, and found that high-speed Internet communication increased the speed and effectiveness of community organization (Hampton, 2000). Members of the community had greater flexibility in their communicative participation. These findings extend the observations of Tindall and Gartrell (1990) regarding networks, visibility, and free riding. Online forums provide a visibility to participation that can encourage individual contributions, support the appearance of group solidarity, and prevent the loss of individual involvement. Yet visibility is a double-edged sword, for while participation increases as network members witness the investment of others, it can quickly decline when network visibility creates the perception that others are no longer invested in the movement.

**3.2 Inter-Organizational Relations**

Social structure has a dual basis: Groups are linked through ties between individuals, and individuals are linked through joint membership in groups (Breiger, 1974). By studying overlapping directorships analysts have been able to map the social structure of Canadian corporate elites and talk about the changing nature of advanced capitalism.

Canadian social scientists have focussed on the relationship between financial and nonprofit corporations because of the central position of financial institutions in the economy. Directorship interlocks have received the greatest attention in the study of incorporate relationships, in part because reliable data are easily available. Interlocks are instruments of coordination and control as well as symbolic announcements of mutual interests. In the postwar Canadian economy, accidentally broken interlocks have been replaced by new interlocks in the same direction between the same pairs of firms (Richardson, 1987). Moreover, such replacements have been related to corporate profitability.
Larger firms in Canada are socially integrated through a densely connected network of directorship interlocks (Carroll, Fox, and Omstine 1982). This network of intercorporeal ties does not appear to divide into discrete and potentially competing groups. Rather, financial firms in general and banks in particular occupy relatively central positions in the network. These corporate actors serve as articulation points, tying together industrial and commercial companies. The structural features of the network suggest there is an independent national bourgeoisie centred in both industry and finance and integrated with foreign capital through the boards of financial institutions. For example, before being taken over by banks, trust companies played important roles in consolidating Canadian enterprises (Richardson, 1988). These findings question claims made by dependency theorists about the marginal and dependent position of the Canadian corporate elite vis a vis foreign capital.

Carroll and Lewis (1991) built upon Carroll et al.'s (1982) findings, by analyzing corporate interlocks between 1976 and 1986. They have argued that the early post-war period was at first an era of "polyarchic financial hegemony" (Scott, 1985, 1987) in the corporate world, but there has been a countervailing shift towards a holding system of family-controlled enterprise groups co-existing with widely-held financial institutions at the centre of Canadian finance capital. Carroll and Alexander's (1999) analysis of networks of interlocking directorships in Canada and Australia in 1992 has shown how historical factors have led to Canada having a less state-centric organization of class power than Australia (Carroll and Alexander, 1999). The persistent strong core of interlocked indigenous Canadian capitalists suggests that before the free trade agreements, globalization had not dissolved the strong network that connected all Canadian capitalists and their organizations.

There are two types of interlocking corporate board ties: directional (an officer of one company on the board of another) and nondirectional. Although both types of interlocks integrate organizations into larger systems (Berkowitz and Fitzgerald, 1995), only directional interlocks co-opt or control (Richardson, 1987). By contrast, nondirectional ties link specific pairs of corporations largely by accident. Only identical ties (ties that are replaced between pairs of corporations in the same direction) have been related to corporate profits and reflect an interorganizational relationship. Other types of interlocks (nondirectional or accidental) have been unrelated to corporate profitability and fill an integrative function that transcended specific corporate interests. For example, strongly-tied alliances in the semiconductor industry aid corporate performance in stable business environments. However, when the firms operated in more uncertain environments, weak ties were more useful, presumably because of their greater range, flexibility, and ease of entry and exit (Rowley, Behrens and Krackhardt, 2000).

Enterprise groups are more integrated than interlocking corporations. They are sets of firms organized together under a single controlling agency and functioning as one unit of capital (Berkowitz et al., 1979). Enterprise groups became more predominant in the 1970s with a concomitant concentration in corporate control. Berkowitz and Fitzgerald (1995) found an almost five-fold consolidation of the number of economic decision-making units within the Canadian economy between 1972 and 1987, simultaneous with a substantial decrease in the number of single-firm and multiple-firm enterprises.

Despite the integrated strength of Canadian corporations, by the mid-1980s, cross-border relationships had led to strong connections with American corporations and a reduced interest by Canadian financial and industrial elites in opposing free trade (Richardson, 1992). Richardson has argued that free trade was part of a larger devolution of power from the central Canadian government to the provinces and corporations.

3.3 World Systems

Canadian "world systems" analysts have added considerations of power and structure to the often-nebulous debates about globalization. Andre Gunder Frank (Frank and Gillis, 1996) argued for a 5,000 year "Kondratieff" world economic cycle rather than the standard 500 year cycle. From this long-term perspective, he argued that an Asian-centred analysis is the key to the development of the current world-system (1998). In his view, the decline of the East occurred about 1800, when European states used American gold and African slaves to buy their way into the already flourishing Asian system.

In recent years the globalization of capital has increased "the transnational character of enterprise-to-enterprise relations, and [changed] the relation of these to states" (Friedmann, 1988, p. 320). The structure of the world food order (from production and finance through trade and consumption) has emphasized national farm programs. This placed the United States at the centre and "allowed international power to take the unusual form of subsidized exports of surplus commodities" (Friedmann, 1991, p. 511).

4. Taking Stock and Moving Forward

4.1 Taking Stock

This article has over-viewed the social network approach to structural analysis and provided a brief historical sketch of its development in Canada and abroad. While social network analysis is undoubtedly an international enterprise, Canadian scholars have made core contributions on a number of fronts, and have been at the forefront since the start. Indeed, we have been impressed with how broad a spectrum of network analytic work we have been able to present through our review of Canadian research. In the past, social network analysis has been criticized for being preoccupied with narrow technical and methodological issues (Collins, 1988; Maryanski, 1991; Emirbayer and Goodwin, 1994) to the detriment of developing theoretical contributions, or substantive analyses. Our review of Canadian contributions shows that this view is inaccurate for Canadian social network research has clearly flourished in diverse fields. Over the last 30 years social network analysis has become a flourishing enterprise, with its own theory, methods, and findings. Research by Canadian scholars has contributed to the following network analytic insights:

- Communities flourish but no longer live in neighbourhoods.
- Computer networks are social networks with relations online embedded in overall social networks.
- Social capital is a network phenomenon; people get different kinds of support from different types of ties - rather than a wide range of support from each tie.
- Emergent properties are alive and well. The nature of networks -- as well as of specific ties -- affects the amount and kind of support that people get.
- Social capital is used for both job and geographical mobility.
- Reciprocity maintains ties, and through indirect exchanges, integrates social systems.
- Networks supply cultural capital. Such cultural capital affects the type of ties people have and can use for social capital.
● Networks structure cognition and social comparisons.
● Networks recruit people to collective action and social movements.
● Within social movements, networks structure coalitions and cleavages.
● Networks structure interorganizational relations.
● The position of an organization in a network can affect its comparative advantage.
● Corporations form coalitions through inter-locking relationships. These often consolidate into larger enterprises.
● The world system is a social network where major units are nation states and trans-national corporations.

In our discussion below, we underscore some of the central contributions of Canadian social network scholars. We also identify some avenues for future research, and several of the challenges that exit for social network analysts.

4.2 Core Contributions of Social Network Scholarship

We have outlined the breadth of contributions provided by network scholars in Canada. We feel it would useful in our discussion to identify some core contributions. For several reasons, the contributions of network scholars in Canada to sociology is not the same as the contributions of network scholars to Canadian sociology. Much social network research has focussed on general principles (the provision of social support, structural influences on social evaluation processes, micromobilization for collective action) rather than idiographic explanations specific to Canadian society. Some network research has been more influential within Canadian sociology (research with an idiographic focus published in Canadian journals), while other work has contributed to advances in the discipline more generally (research with a nomothetic focus published in international journals). Arguably the scholars who have had the highest visibility within Canadian sociology are those who have examined network relations amongst corporations (and other economic formations) through analysis of corporate interlock data (such as Carroll, Ornstein, Fox, Richardson, and Berkowitz). While this work draws upon some general methodological and conceptual principles, it has been primarily interested in describing the structure of Canadian capitalism and its similarity or dissimilarity from capitalism in other nation states. The work of these scholars has been well published in Canadian journals such as the CJS and CRSA. Scholars who have looked at more general processes (such as networks and social support) have been more likely to publish in international journals, and have perhaps had relatively less visibility within Canada. For this reason we would like to emphasize the contributions of these latter scholars.

4.3 Some Core Network Analytic Contributions to Social Capital Research

There has been much recent interest within sociology in the concept of social capital. In general, social capital can be thought of as a good that accumulates (and dissipates) as a result of repeated social interactions among members of a social network. In other words, repeated social interactions lead to the development of various types of social structures. These social structures facilitate certain types of actions (e.g., networks with closure facilitate monitoring of behaviour). A parallel concept (to social capital), "social resources", developed independently within the social network literature (Lin, 1999). In early work in the social capital tradition (such as Coleman's) there was some confusion between the features of the social structure and the actual resources that are accessed. According to different scholars, social capital included things such as "community norms", "group solidarity", and "participation in voluntary and civil organizations". Network researchers draw a distinction between the properties of social structures and the resources that are accessed through such structures (Lin, 1999),(9) often using the term social capital to refer to the latter.(10) Several lines of social network informed social capital research have thrived in Canada. These revolve around "community and social support" and "class and cultural capital".

4.3a Community and Social Support:(11) Barry Wellman (and his colleagues) has made several core contributions to social network scholarship(12). A substantive contribution exists in the area of community sociology. Classic definitions of community involved three conceptual dimensions: 1. shared geography; 2. collective identity; and 3. structural integration. While these three dimensions of community are interrelated, they can be analytically separated and treated as semi-autonomous indicators of "community". Wellman has argued that studies of urban communities have tended to focus on the first two dimensions (primarily the geographic dimension). Drawing upon network theory and empirical data collected over time in Toronto he has argued that if analysts focus on the third dimension (structural integration) by employing social network analysis, then it becomes apparent that many people live in thriving personal communities, albeit communities that are geographically scattered. Indeed, communities have tended to become more geographically dispersed as transportation and communication technologies have pushed back the constraints of geography. Personal networks have become fragmented, specialized, and complex. These insights have been far reaching in helping scholars to re-evaluate the state of communities in modern, industrialized, urban societies. However, as a good deal of this research has taken place in Toronto, there needs to be replication of this work in a variety of other Canadian urban centres.

Another major contribution by Wellman and his colleagues is in the area of social support. As Wellman's research has demonstrated, social support is not primarily a dyadic activity, but rather a social network activity where support flows asymmetrically among pairs of individuals, and where those seeking support obtain different types of support from different sources within their personal network. A recent related contribution involves the development of multi-level analysis, where individual, tie, and social network effects upon the provision of social support can be unpackaged. This research has reoriented the focus of social support research from dyads to networks. One conclusion of this research is that the composition of a network affects the types of support that can be accessed. Great strides have been made in this area, but more research is needed on what specific kinds of network characteristics are important for particular types of social support.

As noted above, in his work on social networks and communities Wellman extended the concept of community to include geographically dispersed communities that are linked together through personal network ties. Recently, Wellman has furthered this line of inquiry by turning his attention to computer mediated social networks. Wellman is one of the first sociologists to take "virtual community" seriously, and has explored the ways in which virtual communities differ from other types of communities. Some findings are counter-intuitive, at least with regards to media discourse about cyberspace. For example, like other technologies such as the telephone, communication over the Internet has tended to supplement rather than supplant other forms of communication. As Wellman has noted, this is an area that has been under-studied by sociologists. There are tremendous social network research opportunities in the areas of cyber-community and cyber-society.
4.3b Social Structure, Social Capital and Cultural Capital: As noted earlier, Bonnie Erickson has made several contributions to the social capital/social resources literature. Of particular significance, in examining the intersections of social networks, class, and cultural capital, Erickson has:

- shown how social networks are related to class
- shown how social networks are related to culture
- distinguished different types of cultural capital and their relevance to class relations
- discussed why social networks are related to certain types of cultural capital

In developing relational class measures of network contacts, Erickson's work on the intersection between social stratification and network structure has moved beyond American models that use SES measures. Along these lines she has refined questionnaire measures of class-based network diversity. Erickson's work has focussed on the security industry in Toronto. As network structures may vary with economic structures, future research needs to examine networks, class, and cultural capital in other industries and regions.

Recent years have marked a productive period for social capital researchers, and have led to a variety of different conceptualizations. It is unclear how broad the scope of phenomena is that should be entailed by the concept of social capital. A partial list of social capital goods includes: trust, information, mobilization, socialization, sanctioning, and social mobility. Similarly, the network structures that are thought to be related to social capital entail a variety of things: network closure, tie strength, role relation, extensity of ties, network range, multiplexity, structural holes, and clustering. Social network analysis provides analytical leverage for understanding the relationship between social structure and social capital. Future research should focus on what types of social capital tend to be associated with particular network structures. Social capital outcomes can be good for some and bad for others. Thus there is also a need for research to examine social ats associated with social capital. For example, while some scholars would see network structures that promote monitoring and sanctioning to enforce this normative behaviour as a social good - these outcomes can also see as instances of increased social control that constrain opportunities for individual expression.

4.4 Moving Forward

We have focussed primarily on the achievements of social network scholars, and in the past several decades these have been many. However, as in all fields there are challenges to address.

1. More work needs to be done verifying if the phenomena empirically associated with network structures are the cause or the effect (Richardson, 1985; Carroll and Ratner, 1996; Tindall, 2000b). For example, people who are more integrated through their social ties into a social movement will become more involved in the movement, but at the same time people who are highly active will develop a greater number of ties with fellow activists. Corporate profitability may be a result of the direction of interlocking ties, or may lead to the creation of such ties. Highly central social movement organizations may be more successful in developing master frames, or social movement organizations who successfully adopt and promote key master frames may become more central in the network. The position of an individual within a social network may be associated with the strength of her attitude due to the influence of others, or the strength of her attitude may lead her to seek out a particular position within the network and thus become an opinion leader. Multilevel analysis (Wellman and Frank, 2001) provides a partial solution to this problem -- at least to understanding the relative importance of different structural properties -- by teasing out emergent structural properties from tie processes and individual agency.

2. Network structures are unlikely to be simply either causes or effects, but to be linked to other phenomena in intricate feedback loops for actors are both constrained by structure and affect structure to their advantage. Network models and explanations need to account for such reciprocal influences.

3. Related to the problem of whether network structures are the cause or effect of various social process, a fundamental challenge of social network analysis is distinguishing between patterned social ties and the resources that flow through such ties. This challenge can be addressed in a number of ways: 1) showing how network based relations at one point in time, are related to resource flows at a subsequent point in time, 2) clearly distinguishing between the type of social relation under investigation (eg. friendship vs. acquaintanceship tie) and the resource (e.g. information). More conceptual precision is needed - especially in research on social capital.

4. One way to gain leverage on the above issues is to conduct longitudinal research. Longitudinal research has been conducted in the corporate interlock area (presumably because of the easy availability of data) but is less common in other areas: Wellman et al.'s study of personal networks (1997) and Tindall's study of a social movement (2000a) are the only two Canadian studies with which we are familiar.

5. Related to the questions about causality raised above, network researchers need to go beyond documenting correlational relationships between network characteristics and particular social outcomes. For example, most scholars of social movements recognize that network ties are essential for recruitment and mobilization. However, the proposed mechanisms for these processes are many and varied. Some proposed mechanisms include: 1) communication, 2) recruitment appeals, 3) identification; 4) social influence, 5) incentives and sanctions, 6) social support, 7) socialization, 8) knowledge and information, 9) personal efficacy, 10) norms, 11) subjective interest, 12) beliefs about others' willingness to contribute, and 13) trust. In much of the work on networks and mobilization for collective action the "mechanism" is not empirically measured, but speculated upon. In a variety of areas network scholars have provided convincing evidence that network relations are empirically associated with social outcomes (like the relationship between network ties and recruitment/mobilization). Future research needs to move beyond empirical associations and investigate network related mechanisms.

The work of the past two decades suggests that network researchers will make advances in understanding the causal directional influence of network mechanisms and that this will be accomplished by the increased collection and analysis of longitudinal data. The complexity structural nature of Canadian society and the vigour of current work and mentorship suggests that Canadians will be
continue to be central in this work.

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Authors' Biographies

D.B. Tindall is an Assistant Professor in the Departments of Anthropology/Sociology and Forest Resources Management at the University of British Columbia. His ongoing research is in the fields of social network analysis, social movements, and environmental sociology. He has a particular interest in the role of social networks in micromobilization for collective action and social movements.

Barry Wellman has been a Canadian and Torontonian by choice since 1967. At the University of Toronto he founded the International Network for Social Network Analysis in 1976 and led this scholarly association until 1988. Concurrently, he edited and published INSNA's informal journal Connections, where many of the scholars discussed in this article served as Associate and Assistant Editors. At the Department of Sociology, University of Toronto, Wellman founded and headed the Structural Analysis Programme, a virtual research institute of faculty and graduate students applying social network analysis to a variety of substantive, theoretical and substantive issues. Wellman (with S.D. Berkowitz) edited Social Structures: A Network Approach (2d ed., JAI Press, 1997), Networks in the Global Village (Westview Press, 1999), and with Caroline Haythornthwaite The Internet in Everyday Life (Blackwell, 2002).

1. Moreover there has been a proliferation of network analyses throughout sociology. One of the anonymous reviewers of this article commented that the leading journal in sociology seems to publish one or more articles having to do with some aspect of social network analysis in virtually every issue .

2. These points are discussed more fully in Wellman and Berkowitz (1988).

3. In addition to the aforementioned studies, see Garton and Wellman, 1995; Wellman, et al., 1996; Garton, Haythornthwaite, and Wellman, 1997; Haythornthwaite, Wellman and Mantel 1995; Haythornthwaite, Wellman and Garton 1997.


5. Brym has also contributed to structural analytic understandings of other phenomena such as: intellectuals (Brym, 1987, 1988), class voting (Brym, 1986; Brym, Gillespie, and Lenton, 1989), and political economy (Brym, 1985, 1986).

6. Staggenborg has also written extensively about coalition dynamics within the pro-choice movement; see

7. A variety of studies have examined the implications of network structure for the flow of information; for some Canadian studies see Erickson et al, 1978; Richardson et al. 1979; Erickson 1981, 1996.


9. Lin (1999) emphasizes the instrumental uses of such resources. In further elucidating the distinction between social resources and social capital, Lin distinguishes between 1) access to social capital (the types of networks people are embedded within, and the factors that explain these structures - such as initial statuses, and education) and 2) mobilization of social capital (the use of contacts to obtain resources - such as information).

10. Some researchers have started to use the term "network capital" to refer to the social network structures that provide social capital (e.g., Wellman and Frank, 2001).

11. This section was written by the first author, not by Barry Wellman.

12. In addition to those discussed below, he fostered the development of social network analysis in Canada through his contributions to INSNA, paradigmatic writings on social network analysis, and mentorship of social network scholars.

13. Bonnie Erickson has been influential in several areas of network research including sampling methods, social psychology, and social capital.