CONNECTIONS

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CONNECTIONS

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SOCIAL NETWORKS is published quarterly, in association with INSNA, by North-Holland Publishing Company. Individual INSNA members are entitled to a reduced subscription rate to SOCIAL NETWORKS when combined with a subscription to CONNECTIONS. Subscriptions and renewals to SOCIAL NETWORKS will be accepted through INSNA at a special discount of $80.00 for SOCIAL NETWORKS plus CONNECTIONS.

CONTRIBUTIONS are encouraged from members and colleagues: research papers of any length, reviews of applications of networks in different fields, comments and critiques, survey articles, computer programs, conference information, abstracts, teaching aids, etc.

For any submission that is larger than four (4) double-spaced pages, please send a floppy disk (5 1/4 or 3 1/2) containing either a WORDSTAR or ASCII file, along with hard copy.

FROM THE EDITOR

This will be my last issue as editor of CONNECTIONS. Alvin Wolfe, whose office is two doors down from mine at the University of South Florida, will take possession of this responsibility for the next issue. Given my spatial proximity and multiplex relationships with Al, I expect I will not be entirely free of this task, but the job of compiling, editing and producing the journal will happily now fall on his shoulders.

The contents of this issue include Mark Granovetter's keynote address from the last Sunbelt Social Network conference. The other articles in this issue include Walter Bien's comments on network analysis, stimulated in part by Granovetter's address; an article by Everett and Borgatti on coloring graphs as a means of showing regular equivalence; and a utility piece by Barry Wellman et. al on using WordPerfect to create reference lists. There are also beaucoup book and journal abstracts, and the abstracts from the Sunbelt Social Network Conference.

Adios mis amigos. I am off to finish my book on Tampa's Afro- Cuban mutual aid society. I hope to have completed a paper on exchange networks, based on a cost benefit analysis of dues and benefits of the society, for the next Sunbelt conference.

MESSAGE FROM THE INSNA COORDINATOR

I wish I could write happy messages such as Barry Wellman wrote, in his "Network Notebook" when he was INSNA coordinator, and, still writes for us now under the heading, "Ties and Bonds". Alas, here it falls to me to give all INSNA members several bits of unhappy news. The bad news is actually tightly interwoven just like a social network. I will lay it out bit by bit in the following order, and then discuss some solutions and try to formulate some plans for a better future for INSNA. We will not let INSNA flounder.

1) This double issue must serve for Nos.1 & 2 of Volume 13, for a number of reasons that will be detailed below.

2) The financial status of INSNA is not rosy, but it is not yet red, either.

3) SOCIAL NETWORKS subscription rates are increasing again.

4) INSNA dues must be increased.

5) Change of Editor for **CONNECTIONS**.

6) Some solutions and plans.

Some details below:

Double issue

This issue must serve double duty, as Nos.1 & 2 of Volume 13. The combination of several facts forced this upon us. The size, complexity, and unusual cost of tables for Number 12 No. 3, put us behind in terms of editor's time, publication schedule, and publication funds. We are planning on going onto a new schedule for 1991, Number 1 will be out in January, Number 2 in May, and Number 3 in September.

INSNA Finances.

Unfortunately, we are running into a fiscal problem because, during a period when most or all of our costs have been rising, we held INSNA dues steady, at $20 for regular INSNA members and only $10 for student members, for which members receive CONNECTIONS and other services. For an additional $45 (total of $65) members have been able to subscribe to SOCIAL NETWORKS. The institutional subscription to CONNECTIONS has been held at $30 for some years. The $10 rate for students does not come close to covering our costs. The costs involved in producing CONNECTIONS have risen for several reasons, including the new "perfect" binding to improve attractiveness especially to libraries, the improved formatting of tables and figures (which for Volume 12, Number 3, cost much more than we had anticipated, and we will not make that mistake again), and including size, which we can do a better job of controlling now that we have become concerned. Mailing costs are also high, especially so because so many of our members are outside the U.S. from which we mail.

When all the bills came due after sending Volume 12, Number 3, the last issue of 1989 which went out very late, INSNA had spent everything it had for 1989 and had to begin drawing upon dues that were coming in for 1990. It costs us about $10 an issue for CONNECTIONS, and we are not collecting that much, except from the twenty or so institutional subscribers. It is when one takes this perspective that one sees that a discounted rate for students presents a real problem.

Increase in subscription rate for SOCIAL NETWORKS.

I received a letter from Elsevier Science Publishers, on May 31, 1990, announcing another increase in the cost of SOCIAL NETWORKS to INSNA members. We had never complained before, but this new increase, representing a 15% rise over the 1988 price, comes at an especially bad time for INSNA. Appreciating the importance of SOCIAL NETWORKS as an outstanding scholarly journal, we did not raise our dues for SOCIAL NETWORK subscribers when Elsevier's price to us increased in 1988. We thought that by absorbing those costs we might encourage more INSNA members to read SOCIAL NETWORKS. Even with that, however, only 104 of our 275 members subscribed to SOCIAL NETWORKS for 1989, and for 1990 we do not yet have that many.

I am much concerned that we will see a decline in the number of members of INSNA itself, and certainly a decline in the number of members who will subscribe to SOCIAL NETWORKS. This will not further INSNA's goal of involving more scholars and practitioners in social network analysis, and it seems a safe bet it will not serve Elsevier's long term goal of getting libraries and other institutions to subscribe to SOCIAL NETWORKS, for surely our INSNA members are Elsevier's best paths for dissemination.

INSNA DUES INCREASE.

We will definitely have to increase our regular membership dues, and give up the general subsidy for ourstudent members. Our dues structure for 1991, compared to the several years prior to it, will look like this:

	Previous Dues	1991 Dues
INSNA Membership	$20	$30
Additional for SOCIAL NETWORKS	45	50
	65	80

Editorship of **CONNECTIONS.**

It is with very special regret that I announce that Susan Greenbaum will be giving up the editorship of CONNECTIONS, with this issue being her last. It is so special not only because she has done a good job, but because I am going to have to take on that job at least for a time until we can find another. The task is a difficult one, I know, because I have watched the process at close range.

It seems possible for me to take it on at this time because I am in the process of giving up the editorship of **CITY & SOCIETY**, the journal of the Society for Urban Anthropology. Not that I needed something to occupy idle hours, but I will try hard to give it the time and attention editing needs.

I will take on the task of editing the journal as well as managing the association's affairs.

Some solutions and plans.

For 1991, INSNA will have to raise dues, but we will at the same time make every effort to reduce costs. I believe you know that most publications by scholarly organizations are subsidized by their associations, and one of the money-making activities of associations is their annual conference. Of course, the Sunbelt Conference has striven to be simply self-supporting and enjoyable, so that it spends its earnings on things like the hospitality suite. In the past, upon occasion, the SBSNC has given some funds to **CONNECTIONS** for printing the abstracts. We are, by the way, reproducing the 1990 Sunbelt abstracts in this issue, and could use some funds as a subsidy for that activity.

I communicated to all those whom I suspected were custodians of some Sun Belt Social Network Conference funds -- Jeff Johnson, Russ Bernard, Eugene Johnsen, and Everett Rogers -- in the hope of convincing one or more of them to share some of those funds with INSNA.

My proposal went like this: INSNA really needs something like a thousand dollars on an emergency basis. If each of four funds contributed something to help us over this lean year, perhaps $250 from each, or if there are only three out there, perhaps $350 from each. I would not mind even considering it a loan that INSNA would repay when SBSNC needed it. I do believe we will get control of our INSNA expenses, increase the dues, sell more subscriptions to libraries, and climb out of this hole in a few years.

My proposal was warmly received by most, but it netted so far only $89.35 (from Everett Rogers who had organized last year's San Diego Conference) Obviously, that is not near the amount I had hoped for, but perhaps more will be received from others. While that will help, it will not resolve our fiscal problem.

One thing that each INSNA member can do to help is to make sure that your institution subscribes to **CONNECTIONS**. Although we have 275 members, there are less than 25 institutional subscribers. We have improved the quality of CONNECTIONS so that it should now be quite acceptable to your libraries, and it is a bargain at the $30 annual rate. Show them your copy and encourage them to subscribe. If you lose your personal copy in that way, we will replace it for you, free. We just recently got our library at USF to purchase all the back issues, twelve volumes for $360. That helps the coffers considerably, even though we have to copy some of those that are out of stock.

Another thing you might do, to help INSNA and to help your students or other protegees, is to offer personally to subsidize their personal subscription. I feel badly that we may be closing out some worthwhile readers by ending our discounted student rate, but you could ameliorate the effect of that by doing it yourself.

Best wishes,
Alvin W. Wolfe, INSNA Coordinator
BITNET address: DLIABAA at CFRVM Telephone: (813)974-2150

ANNOUNCEMENT:

INTERNATIONAL SUNBELT SOCIAL NETWORK CONFERENCE

FEBRUARY 14-18, 1991, in Tampa.

The eleventh annual midwinter conference of network scholars and practitioners, cosponsored by the International Network for Social Network Analysis, the University of South Florida, the University South Carolina, and East Carolina University, will convene on the Suncoast of Florida, at the Radisson Bay Harbor Inn, Tampa, Florida. Session Topics include: Corporate Networks; Inter-organizational Networks; Intra-organizational Networks; Personal Community Networks; Networks and Health Care Delivery; Diffusion; Networks Through Time; Social Support; Economics; Geography; Primate Networks; World Systems; Network Autocorrelation; Intra-Cultural Networks; AIDS; Communication Networks; Cognitive Networks; Biological Networks; and much more.

Two tutorial workshops are planned: Barry Wellman is offering a workshop on Introduction to Network Analysis, and Stanley Wasserman will give a workshop on "A Second Course" in Network Analysis. During the conference PCs will be available for participants to share and compare their favorite programs.

Those who wish to participate in the workshops or present papers in the sessions are urged to communicate with the Program Coordinators: Jeffrey C. Johnson (Sociology and Anthropology, East Carolina University, Greenville, NC, 27858, BITNET CMJOHNSO@ECUVM1), Katherine Faust (Sociology, University of South Carolina, Columbia, South Carolina, 29208, BITNET N040012@UNIVSCVM).

Call in your reservations now:

Radisson Bay Harbor Inn (800) 333-3333.

Mention "International Sunbelt Social Network Conference" in order to get the conference rate. Call soon, because February in Florida is a busy season, and you might not get any room at all if you wait until December or January!

For further information, or local arrangements only, contact Alvin W. Wolfe, INSNA Coordinator, Center for Applied Anthropology, Tampa, Florida 33620, BITNET DLIABAA@CFRVM.

NODAL NOTES

Susan Greenbaum

Inter-University Consortium for Political and Social Research: New Mini-Courses in Social Research.

Social network analysis focuses on relationships between social entities. It is used widely in the social and behavioral sciences, as well as in political science, economics, and industrial engineering. This one week workshop will present an introduction to various concepts, methods, and applications of social network analysis. The primary focus of these methods is the analysis of relational data measured on groups of social actors. Topics to be covered include an introduction to graph theory and the use of directed graphs to study structural theories of actor interrelations; structural and locational properties of actors, such as centrality, prestige, and prominence; subgroups and cliques; equivalence of actors, including structural equivalence, blockmodels, and an introduction to local analyses, including dyadic and triad analysis; and statistical global analyses, using models such as p1 and its relatives. The social network paradigm is gaining recognition and standing in the general social and behavioral science communities as the theoretical basis for examining social structures. This basis has been clearly defined by many theorists, and the paradigm convincingly applied to important substantive problems. However, the paradigm requires a new and different set of concepts and analytic tools, beyond those provided by standard quantitative (particularly, statistical) methods. These concepts and tools are the topics of this workshop. Prerequisites for this workshop are familiarity with matrix algebra. A background in linear models and categorical data analysis will be helpful, but not required. The workshop will consist of morning lectures, afternoon computer sessions, and late afternoon question and answer periods. Readings will be taken from the forthcoming book, *Social Network Analysis: Methods and Applications*, by Wasserman, Faust, and Iacobucci, to be published by Cambridge University Press. The course will meet July 23-27. The fee for the course is $400 for individuals from ICPAR member colleges and universities and $800 for those from institutions that are not affiliated with ICPSR. Application is considered to be incomplete unless accompanied by fee payment. Application and payment must be received by July 6. Registration is limited and cancellation less than 14 days prior to the workshop is subject to a $50 late withdrawal fee. Dr. Stanley Wasserman, Department of Psychology, University of Illinois, Urbana, will be the instructor in this workshop. For further information contact: Henry Heitowit, Program Director; ICPSR Summer Program; P.O. Box 1248; Ann Arbor, MI 48106; (311) 764- 8392.

Journal of Social and Personal Relationships: Call for Manuscripts.

The Journal will publish a special issue centering on social networks and personal relationships. The issue is scheduled for publication in February 1992. We are interested in theoretical and empirical material that examines the impact of network composition and structure on the content and operation of personal relationships, ranging from marital ties to relatively weak ties with community members. Appropriate contributions include articles focusing on structural features of networks and their impact on the internal character of a personal relationship (e.g., network density and relationship stability), and articles focusing on relational features of networks such as the degree of social participation with friends and its impact on marital conflict. Are, for instance, socially isolated couples more prone to experience conflict and violence? Four copies of manuscripts should be submitted for editorial review no later than January 1, 1991 to either Bob or Barry. Manuscripts should be prepared in a style consistent with the *Journal*, with double-spaced text, and should be no longer than 30 pages including references, footnotes and tables. Contact: Robert Milardo; Child Development & Family Relationships; 30 Merrill Hall; University of Maine; Orono, Maine 04469; (207) 581-3128; BITNET RHD360 @MAINE; or Barry Wellman; Centre for Urban & Community Studies; University of Toronto; 455 Spadina Ave.; Toronto, Ontario, Canada M5S 1A1; (416) 978-3930; BITNET Wellman @UTOREPAS.

TIES AND BONDS

Barry Wellman

Info Flows

Clyde Mitchell (Oxford) has just been elected Senior Fellow of the British Academy. Victor Marshall (Behavioural Science, Toronto) appointed director of its new Centre on Aging. Marshall also heads the new $5 million Canadian inter-university research network to promote "independence and productivity in an aging society"....**Carolyn Rosenthal** appointed to faculty of Rehabilitation Medicine, Toronto....**Benjamin Gottlieb** (Psychology, Guelph) awarded 2-year Senior Research Fellowship by Ontario Mental Health Fdn. so he doesn't have to teach so much....**James McConnell** (Psych, Michigan) died at the age of 64 of a heart attack. He published the Worm Runners Digest for 20 years -- one of my main inspirations for Connections....**Barret Lee** to Pennsylvania State....**Joe Feagin** to Florida-Gainesville in a research chair....Former **Connections** Assoc Ed **June Corman** (Soc, Carleton) on sabbatical leave, 7/90-8/91 at Sociology dept, Ont. Inst for Studies of Education, Toronto....**Susan Sim**, another former Assoc Ed won 1 of 5 **University of Toronto National Scholarships** to start her undergrad career. (Lenin said: Get 'em while they're young. [Guess current Eastern European events mean he forgot to add: Keep 'em when they mature.]....**Gary Alan Fine** now chair at Soc, Georgia....**Ricardo Stanton-Salazar got his Ph.D. from Stanford & is now an Asst Prof, California-San Diego....Shumpei Kumon** is joining the International University of Japan. He also will direct a research institute on hypernetworks. He & Henry Roskovsky are editing the third volume of The Political Economy of Japan which will contain 4 chapters on interorganizational networks....**Sebastien Reichmann** (Centre Hospitalier Sante- Anne, Paris) has started a longitudinal study in a Lyon mental hospital on the impact of social networks & other stress-related variables on schizophrenic relapse....**Bev & Barry Wellman** celebrated their 25th anniversary, July 6 1990. True to form, they postponed their party till Sept 2, when Bev should be done with her thesis & Barry should have met a few more deadlines. We were grad students when we started, and we're grad students now....Did you know that the University of California Wellness Letter classifies "tenured professors" as a "low-strain job (along with carpenters & successful artists): an occupation with low demands & high decision latitude. Then what am I doing here at 10 PM on a beautiful July nite, with Bev at my side, simultaneously revising her thesis (on networks of finding care for low back pain)? **Susan & Paul Greenbaum** also celebrated their 25th anniversay, June 19, 1990. [Editors note: I don't know what inspired the Wellmans to wed in that particular period, but I know that the Greenbaums were rushing to take advantage of a provision of the draft law that exempted married men; the provision was sadly eliminated in August of the same year.]

For a Free Trip to Japan...

... tell your Dean that INSNA is organizing at least one session at the 30th World Congress of the Institute of International Sociology, Kobe, August, 1991. I don't know much about the IIS, except it's an alternative to the International Sociological Assoc (where INSNA met in Madrid, 7/90). Moreover, the conference organizer, Masamichi Sasaki, writes me that his Princeton thesis dealt with social networks.

Barry Wellman, Centre for Urban & Community Studies, 455 Spadina Ave., Univ of Toronto, Toronto Canada M5S 1A1; bitnet: wellman@vm.epas.utoronto.ca

Exciting Publishing Opportunities

Robert Milardo (Family Studies, Maine) reports the 5/90 "Nags Head" conference on interpersonal relations & networks was the "best conference I've been to." Milardo & I are editing a special issue for the **Journal of Social and Personal Relationships** on personal relationships in network context -- please send either of us any likely papers asap.

Barry WellmanMI/MNI is also editing a book for Westview Press, tentatively titled, *Networking the Global Village*. It will focus on the use people make of personal networks around the world to deal with opportunities, problems and crises. It will be heavily comparative, demonstrating how social/economic/political conditions in societies affect how people use networks to access resources. If you want in, send me an original (or obscurely-published) paper -- asap.

Second Letter from Bulgaria

Network Analysis on the Bulgarian Frontier

"We are the first line of Christendom's defense against the Shiite Ottoman Empire," warned the Kurdjali head of the Bulgarian Committee for Bulgarian National Interests.

"Mon pauvre Bulgarie," lamented a friend as he contemplated a future combining the uncertain combination of entering the world market economy & continuing to deal with the petty rigidities, perks and arbitrariness of the continuing central-bureaucratic party/state.

"We have 1,700 Bulgarians on our hands. What's that country like?" asked an official of Canada's Immigration & Refugee Board.

"Bulgaria? I've never met anyone who's actually been to Bulgaria. Let's have lunch," said an Ontario cabinet minister.

"Bulgaria? Who's interested in Bulgaria?" snapped the Canadian government official I had approached about bringing over some sociologists.

Who, indeed, cares about Bulgaria? Three more North American social scientists than did a year ago. In April 1990, **Stan Lieberson** (Soc, Harvard) & **Tom Pettigrew** (Soc Psych, California-Santa Cruz & Amsterdam) & I attended a small international workshop on "the ethnic crisis in Bulgaria," the tensions between the majority ethnic Bulgarians and the 9% of the population who are "Bulgarian Turks". These tensions had made the Western press in the summer of 1989 when a reported 300,000 Bulgarian Turks had emigrated across the land border to Turkey. Later, after a regime change in November, 1989, 120,000 had reportedly returned to Bulgaria.

Things, as we all learn in graduate school, were more complex than the New York Times had made it seem. For one thing, no one could agree on what to call the "Bulgarian Turks". Reportedly, most were not practicising Muslims, many didn't speak Turkish, and some Bulgarian historians claimed that most were not Turks at all but descendants of Bulgarians who had converted during the hundreds of years that the Ottoman Empire had ruled the area. We heard terms like "Turkish-speaking," "Turkic-speaking" [i.e., not 'really' Turkish] and "so-called Turks". The North Americans suggested "Turkish-Bulgarians," but this interloping suggestion didn't catch on. The Turks couldn't help. None participated in the conference -- from either Bulgaria or Turkey.

(Later I asked some Turkish sociologists if they'd like to participate in a follow-up conference. They were eager -- but quite fearful of their own government's reaction.)

The conference itself was filled with serious Bulgarian scholars, trained and eager to do empirical research. The dominant theme was the need to heal ethnic breaches and wrongs in building a new, democratic Bulgaria filled with brotherhood. One rich paper documented what happened to factories and towns when the Turks had left. Others argued about why so many left so quickly -- was it "mass psychosis", kinship networks over the border, doing just what the East Germans would do a few months later, or a response to the structural rigidities of the society.

Stan Lieberson suggested ways of counting people -- nobody knows how many Bulgarian Turks there are and where they live and work, except perhaps the "sixth department" of the police and they weren't telling. (As the police table of organization only lists five departments, the "sixth department" doesn't officially exist. Nevertheless, the government had announced that they were abolishing this non-existent department a few weeks ago.) Tom Pettigrew suggested ways of studying norms and attitudes of the two ethnic groups, and pointed out mechanisms to reduce inter- group tension. I suggested ways of studying friendship relations and activities of daily community life. (Network analysis, of course!)

One Soviet anthropologist at the conference startled me. The problem, he said, was "private property." Give the Bulgarians and the Turks private ownership of the means of production and reproduction, and they will live in peace with each other. This was Engels on The Housing Question with a new slant! (This line appears to be widespread in the Soviet Union. The 4/90 issue of Sputnik [the Soviet equivalent of the Reader's Digest] contains economist Andranik Migranyan extolling Reagan/Thatcher neo- conservatism for their "emphasis on enterprise, initiative, personal responsibility, labour and incentives to dynamic activity." This, Migranyan claims, will help the people take back the "colossal wealth" of the nomenklatura -- nice thoughts but empirically untrue in the West.)

Bulgaria itself was at a cusp, awaiting with uncertainty the first free election of many years. (The Communist Party had taken over in 1944, and there had been an authoritarian monarchy before.) The old Todor Zhivkov regime had been ousted 10/10/89 by an intra-party coup. The Berlin Wall had toppled simultaneously, so Bulgaria had received only a few paragraphs.

Although the regime had toppled, the party continued in power, changing its name to the more photogenic "Bulgarian Socialist Party." (First joke I heard: Q: How is Bulgaria different from Canada? A: Canada still has a Communist Party.) It ran on the decidely post-revolutionary platform of "Tradition and Authority".

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To be sure, the political system had opened up. When I had visited Bulgaria during the old regime, people had joked in private but were discreet in public. Now opposition groups were legal and earnestly plying their wares through radio, TV & their own newspapers. Todor Zhivkov jokes had gone public. A favorite: "The party uses Zhivkov soap. The apparatchiks wash it off and everyone smells clean."

There was an on-going debate between personality theorists -- those who blamed all past problems on the Zhivkov clique -- and structural analysts who felt that the authoritarian system itself was to blame. Indeed, INSNA member Detelina Radoeva and Dimitrina Dimitrova gave a paper at our conference arguing that the "command-and-administer" system itself had caused the present ethnic crisis by making it easy for a small clique to make important, arbitrary decisions. (Sounds like Canada's "Meech Lake" crisis -- perhaps we need Bulgarians to advise us now.)

Indeed, the persistence of the command model was striking. To be sure, there had been a profound change since my last visit towards freedom of speech and communication. But the system was still monolithic Bulgaria Inc., with only a tiny private sector. Hence it was still a hierarchical pyramid, with loyalty expected upwards and rewards for good behavior flowing downwards. Petty regulations were rife -- registering to stay with friends at their private home took 3 hours, 2 offices and 4 forms. The municipal district office had to know, the office for the registration of foreigners had to approve, and the registry in the apartment building had to have an officially-stamped record of all those who spend the night there. But my Bulgarian colleagues assured me that while the forms had to be filled out, they should not be taken seriously. As long as the papers looked good, people slept where they wanted. This was a common contradiction between burdensome bureaucratic regulation and good-humoured improvisation -- in order to get things done and enjoy oneself. (See story below.) Certainly, my basic experience was almost continuous hospitality, joking and laughter.

Postscript: July 10, 1990

The Socialist (née Communist) Party won the June election with a small majority. They carried the rural areas strongly but lost in the capital city, Sofia. Detelina Radoeva writes me that the Socialists got the type of vote that normally goes to conservatives in the west: rural, pensioners, partisans from the wartime period, older people, less-educated folks, those with perks, ethnic Bulgarians living in areas with a Turkish majority. The United Democratic Front ("CDC" in Bulgarian) got the urban vote, people repressed by the party, the entrepreneurially- inclined, those who have been waiting a long time for cars, flats, etc., students. Some students are currently sitting-in at a central park next to Sofia University, in a scene reminiscent of Berkeley in the late 1960s and (the mellow days of) Beijing's Tianamen Square last year.

The Socialist Party benefited in the voting by its monopoly status. It controlled all government ministries, virtually all commerce, farming and industry, and all local government. Although there had been similar situations elsewhere in eastern Europe, only in Bulgaria were the Socialists/Communists able to win a quasi-free election -- the first instance of this happening in a nation that I can remember. Some Bulgarian friends look forward to a reform-minded example of how humane democratic socialism can work -- although the party says it is committed to a market economy. Others fear that the routines and perks of the command-and-administer system would inevitably continue under the structural conditions of monopoly control.

As I write, the situation is decidedly fluid. The Socialist president has been forced to resign -- a victim of an embarrassing remark recorded on a VCR last December. The NY Times reports the party is divided between managerialist reformers and traditionalist conservatives. Meanwhile, the opposition is thinking about moving from its current front set-up -- a loose coalition of 16 parties and movements (Greens, Social Democrats, Eco-Glasnost, civil liberties, etc.) to a more united party.

<u>How to Beat a Bulgarian Radar Trap</u>

[Revised and expanded version of story first appearing in The Toronto Star, 23 June 1990. Reprinted with permission.]

Sofia, April, 1990 -- "The Lada is fast, but the Skoda is quick!" Detelina Radoeva exulted, as she squirted past on the inside of a curve. She smiled. "He will feel humiliated." Bulgaria's only network analyst had struck another blow against machismo on the road to Gabrovo.

We'd been following the Lada for 10 kilometers in standard Bulgarian fashion, tailgating nose to bumper. Every time we had swung out to pass, the Lada had pulled away. Hence the inside pass. "There was nothing else to do." [Author's note: I know you've read this lead-in before. But it's a picaresque tale, combining two trips into one.]

The Skoda felt like a cross between my old BMW 2002 and Corvair -- its rear engine and quick steering whipped us around turns and potholes. The 1200cc engine accelerated like a tiger to 80 kph, but had no top end.

We were wearing shoulder harnesses, as required by law. Bulgarians drape them over their shoulders but don't fasten them. In a society filled with petty regulations, people find freedom where they can -- even when they must ignore the laws of physics.

To celebrate our triumphal pass, we ate salami and an apple as well as granola I'd imported from Toronto's famous Harbord Bakery. All Bulgarians travel with bags of food -- "just in case." A 5-liter gas can is also standard equipment, routinely used when no gas stations are open or the line-ups are more than a half-hour. The ultimate last resort is the 2-liter can buried in the trunk. This has become a Bulgarian metaphor: "To use my last 2 liters" means to dig down within oneself for the last bit of emergency energy.

This time the gas station only had a 20 minute wait. The approved queuing procedure is to shut off the engine -- why burn the gas you are waiting for? I found out why Skodas, Wartburgs, et al. are called "socialist cars." Two people cooperate on line: one pushing, the other steering. Fortunately, socialist cars are light.

I asked about Trabants, the slow, noisy little car from East Germany. Someone joked that Bulgarian farmers hated them. "The sheep eat right through them."

The woman in the next car on line was a literature student reading Thomas Pynchon's The Crying of Lot 49 in English. Her face lit up when I started chatting. "Canadian? I have a cousin who hopped off the Cubana airlines plane last month when it refuelled in Gander. Could you call him when you get home?" Over 1,700 young Bulgarians reportedly have recently used this route in the past few months, filling all the hotel rooms in Newfoundland while their immigration cases are heard. I met six more "cousins" during my week's stay.

Being good sociologists, we used survey research to find our way. When we came to a problematic intersection, we flagged down a passing

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car. The first car always stopped -- no North American fears that we were highway bandits. A lively discussion ensued as (a) to the best route and (b) whom to vote for in the June 10th election -- the first free one in many decades. We usually learned that we had just passed the correct turnoff. Fortunately, Bulgarians drive backwards with great skill.

Of course, I had to drive the lively Skoda. The speed limit was 80 kph, so like all Bulgarians (except Trabant drivers) I did more than 100. A bad vibration point at 100 suggested I take it up to 120.

No need for concern, a cooperative radar detection system was at work. Bulgarian radar traps (which come about every 30 kilometers) are stationary --either mounted on a parked police car or pointed (like a bazooka) by a policeman standing at the side of the road. When drivers pass such a trap, they flash their headlights at oncoming traffic for the next 5 kilometers. Everyone smiles, waves and slows down in true socialist cooperation.

This system is cheaper than an electronic radar detector but not as reliable. As I came over a hill, a man ran into the middle of the road waving a little red octagonal sign with "Stop" written on it (in English lettering --it's a universal word). I realized that a car hadn't passed in the opposite direction for over 5 kilometers.

The uniformed policeman had a huge handlebar moustache. Another man was in civilian clothes with a red armband, a party volunteer doing his bit for good driving morality.

The two policemen demanded my license. My companion began talking fast. Her voice and body language became deferential -- you do not deal with the police as you do with macho Lada drivers. The policemen were perplexed. They could handle two categories of speeders: Bulgarians, and foreigners in foreign cars. I was the anomaly -- a foreigner driving a Bulgarian car.

A solution came after long discussion and several Marlboros shared "for friendship". My visit to Bulgaria had been sponsored by the Trade Union Confederation, now headed by a sociologist. The policemen decided that I was a prosperous foreign trade unionist come to invest in the "new Bulgaria". One policeman smiled and asked me to call his cousin in Newfoundland. My punishment: My companion was ordered to give me a stern lecture in English on proper Bulgarian driving procedure.

A few days later, my visit ended. A friendly functionary helped me through customs. As I left, he whispered, "Don't forget to call my cousin."

Further Notes on the Sociology of Bulgarian Cars

As Bulgaria does not manufacture any of its own cars, the cars on the street give a good guide to the broader East European market. But it's important to remember that cars have not been bought because a particular model was freely chosen from a host of alternatives. Rather, people drive what they can get -- either because their number came up in a queue (some people told me of an eight-year wait) or because they got access to a new or used car through their network of connections. Where we in the West limit choice through price, Eastern Europe has limited choice through access.

Almost all cars on the road are of East European manufacture, except for some Mercedes and BMWs presumably used by some of the top elite or bought through money gained in the "second economy" (black and grey markets). Sporting drivers prefer the tight handling of the Czech-made Skoda. A few are sold in Canada as inexpensive sports sedans, but it took a drive through Bulgaria to make it remind me of my favorite BMW 2002.

My informal count told me Ladas (USSR) were the most widespread car -- Fiat 125 derivatives. Although sold in Canada as a low- end model, it is a desirable car in Bulgaria. The only thing faster is the Volga (USSR) -- usually big and black, as seen in Western spy movies -- the favorite of apparatchiks (those who make the apparatus run). The Volga looks and acts like a 1950s American car -- good speed, poor handling, soft ride, gas eating. I also saw a few new Ladas (a handful have been sold in Canada as the Samara), but didn't learn anything about them.

Although the Trabant has become the maligned symbol of East Germany, it's kinder to see it as a Citroen 2CV equivalent. Trabant owners were aware of its many faults but were even more delighted to have a car that was available to purchase and that they could afford to buy.

Another East German two-stroke, the Wartburg, was more upmarket, modern looking and larger. Other small cheap cars were the Russian Moskvitch and Zaporojetz. There were some large Dacias -- Romania had bought the tooling for the old Renault 12 -- all with peeling paint and tattered upholstery.

But, as elsewhere in eastern Europe, the big distinction is between those who have cars -- of any sort -- and those who do not. By now most Bulgarian households have access to a car -- if not their own then through their immediate family or intimates. And the cars are well-used, despite excellent public transport and gasoline shortages. More changes are in store. "What with the parking problem and my joining the ecology movement," Detelina said [we'd had to walk 200 metres to her office], "I may have to start bicycling to the office".

Articles

The Myth of Social Network Analysis as a Special Method in the Social Sciences

Keynote Address: Sunbelt Social Networks Conference
San Diego, February 15, 1990

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THE DENIAL

In the history of public speaking, there have been many famous denials. One sunny day in 1880, Karl Marx declared: "I am not a Marxist". On a less auspicious occasion in 1973, Richard Nixon insisted "I am not a crook". Neither Marx's nor Nixon's audience gave much credence to their denials, and you too may respond with disbelief when I tell you that "I am not a networker!".

You may want to know what has driven me to such a claim. In response I tell you that for seventeen years, I have been haunted by a specter -- but not the specter of communism. It is instead a specter that has insinuated itself into my life on every occasion since 1973 when I have been introduced to a new acquaintance unfortunate enough to know some sociology.

On such occasions, these new friends have thrown etiquette to the winds. They do not say "Hello" or "How nice to meet you", and introduce themselves, as in normal civilized discourse. Instead, a glazed look comes over their eyes and they say, as if uttering some incantation, "Oh yes, The Strength of Weak Ties!". Some simply say "weak links!" -- they've mixed me up with Oscar Mayer. When I hear this, I know what Richard Nixon must feel when a new acquaintance says: "Nixon, Nixon -- oh yes, Watergate!".

So this is my specter: the specter of weak ties. And it helps to explain why I have always resisted being classified as a "network analyst". Perhaps it is because of my flight from being typecast as a networker, that this is the first Sunbelt meeting I have attended. And after my first few publications that were explicitly on network analysis, a period that ended in 1976, I believed that this period of my career was behind me and that I was moving on to my more substantive interests in stratification, economic sociology and sociological theory.

A FUNNY THING HAPPENED ON THE WAY OUT OF NETWORK ANALYSIS

But a funny thing happened on my way out of network analysis: as I innocently pursued these other interests, which I approached from various directions, I always found that as I got more deeply into any subject, network ideas kept coming in the back door. I would write an article that I thought was completely innocent of any network ideas, and someone who had read it would say: oh yes, that's the network approach. I once gave an entire course that I thought didn't have a single network idea in it, and then overheard the TA telling his students, "Of course, Granovetter represents the network approach to this subject".

Let me give you some examples: In the late 1970's, I began to pursue my interests in stratification, by looking more closely at the way labor markets distribute income to workers. In the process, I became quite interested in comparing the way economists and sociologists had approached these questions, and read up on economics. I came to the conclusion that two fallacies dominated both the economic and sociological literature on income differences.

One was the assumption that these differences derived entirely from the demand side of the labor market: that the characteristics of the type of work you do is what determines your rewards. This fallacy is most obvious in the functional theory of stratification, which suggests that the most important work in a society must receive the highest rewards in order for the society to function well. There are elements of this fallacy in much Marxist literature on stratification as well.

The other, and symmetrical error is to suppose that inequality derives entirely from the supply side, as both the theory of human capital and that of status attainment, would lead you to believe.

But it was clear to me that both the characteristics of positions and those of people must be critical to establishing inequality, and it then follows that what is most crucial is how people with certain characteristics get matched to positions with high or low potential for rewards -- what I came to call the problem of matching processes (see Granovetter 1981).

But you don't have to think very long about matching processes before you see that they basically concern location in social networks and how these locations shape peoples' work lives and the kinds of positions that are available to them. And this led me to see that a question that is simply finessed in classical and neoclassical economics -- that of how supply and demand are made to mesh -- is actually the central question, and is one that can only be understood in the framework of social networks.

More generally, as soon as you become dissatisfied with an economics that is built on the comparative statics of equilibrium states, you have to start talking about what happens when systems are out of equilibrium. This means talking seriously about how changes occur. And what happens in such a dynamic account is that you have to look at how people make use of their location in social networks to mobilize resources in order to achieve their economic goals. They may well act rationally, but this rational action is highly constrained by the structure of those networks and the resources available in them. Probably my most systematic attempt to articulate this is in the article I have written with Charles Tilly on inequality and labor processes (Granovetter and Tilly 1988).

In my attempt to move away from network analysis, I started to feel like Alice in Through the Looking Glass. She had already gone through the mirror into the "looking-glass house", had gone out the door, and was trying desperately, but without much success, to get away from the house: resolutely turning her back upon the house, she set out once more down the path, determined to keep straight on till she got to the hill. For a few minutes all went on well, and she was just saying "I really shall do it this time --" when the path gave a sudden twist and shook itself (as she described it afterward), and the next moment she found herself actually walking in at the door. "Oh it's too bad!" she cried. "I never saw such a house for getting in the way! Never!" (Carroll 1871 [1984]: 169).

Like Alice, the harder I tried to run away from the house of social networks, the faster I found myself back there. I can't say that I still fully understood this in the early 1980's, and so I set out on an ambitious project (now at least five years behind schedule) to think through the social basis of economic life. I read a lot about industrial organization, and other aspects of markets, and came to feel that the field was dominated, again, by two fallacies:

One had been identified by Dennis Wrong as the "oversocialized" conception of human action in modern sociology -- the notion that people automatically follow widely agreed-upon norms in their daily life, and that this is what guarantees social order (Wrong, 1961). Wrong meant to be criticizing the structural-functional sociology of Talcott Parsons. But most standard economic arguments implicitly make the same assumption as well, since the old Hobbesean question of why it is that people do not pursue their self-interest by force and fraud does not arise. Instead, as Albert Hirschman has pointed out, it is normally assumed that the pursuit of economic goals is a "gentle, civilized activity" (Hirschman 1982).

But classical and neoclassical economics also could be characterized as harboring an "undersocialized" conception, since they insist upon viewing individuals as atomized actors, whose behavior might be influenced by the aggregate outcome of the behavior of others, but not by their ties to any particular others. Economic man, instead, moves through life wearing social blinders, in the rational pursuit of individual gain.

As I thought this through, I realized that these two apparently opposite fallacies actually went together very easily, because both depict individuals as unaffected by any ongoing social relationships. This is the more obvious for the undersocialized account, but is true in the oversocialized one as well because once actors, conceived in this way, have internalized the prevailing norms and values, they also become oblivious to the social life in which they are embedded. They move through their daily round like those poor souls in the movie, Invasion of the Body Snatchers, who have been taken over by pods from outer space.

What I came to argue is that one has to thread one's way between these under and over-socialized views by seeing that all economic activity is in fact embedded in complex, ongoing networks of social and economic relationships, and the trust that makes such activity possible, but also the malfeasance that can bring it to a halt, can only be explained by a close analysis of how people function in such networks. This argument, made in my 1985 American Journal of Sociology article, will be greatly elaborated in my forthcoming book Society and Economy: The Social Construction of Economic Institutions (to be published by Harvard University Press).

THE MYTH OF NETWORK ANALYSIS AS A SPECIAL METHOD IN THE SOCIAL SCIENCES

By this time I had realized that my flight from the house of social networks was futile. But I also realized something else, that made such flight less urgent. To explain this, I should begin by admitting that the title of my talk, like most good titles, is stolen: in this case, from a 1959 paper by Kingsley Davis, which had been his keynote address to the 1959 ASA meetings: "The Myth of Functional Analysis as a Special Method in Sociology and Anthropology" (Davis 1959). In this paper, Davis argued that although you couldn't always be sure what "functional analysis" was supposed to be, that "examination of the features most commonly mentioned and of the work actually done under the label shows it to be, in effect, synonymous with sociological analysis" (1959: 757).

Without recapitulating his entire argument, I simply note his claim that functional analysis is basically about the consequences of social patterns and the impact of these consequences in maintaining or changing the patterns themselves. He goes on to say that we can hardly conceive of any social science that isn't about this.

I will abstain on whether Davis was correct about functional analysis. If he was, I wonder what he thinks about the recent revival of functionalism under the name "neofunctionalism", in a city not far north of here. But for my purpose, I want only to borrow the title, because what I came to realize was that it shouldn't be any surprise to me that I kept coming back to network analysis, since I am a sociologist, and there really is no way to remain faithful to the fundamental insights of sociology without paying attention to networks of social relationships.

What, after all, is the distinctive contribution of the founders of modern sociology, such as Durkheim, Weber and Simmel? It is precisely that one cannot understand social life as the summing up of individuals' motives and traits, as they are given by the study of psychology. This was the fundamental insight of Durkheim in his classic study of suicide -- that this most individual of acts is to be explained by the way people are or are not integrated into social networks; and in The Division of Labor in Society, Durkheim argued that modern societies with an advanced division of labor can only be held together by the complex networks of complementarity that this division produces.

If social relations and the structure of networks of relations are practically coterminous with social science analysis, then how can it be that social network analysis could seem so separate to so many from mainstream work? I believe that part of the answer is that for thirty years, American sociology and, to some extent, anthropology, was dominated by the followers of Talcott Parsons, who had a very different view.

Parsons's "discovery" in The Structure of Social Action (1937) was that four great thinkers -- the sociologists Durkheim, Weber and Pareto, and the economist Alfred Marshall -- were all converging on a single proposition that Parsons had finally brought to light: exactly the one criticized by Dennis Wrong -- that society is integrated by common value orientations held by all its members. In saying this, Parsons believed that he was upholding the classic sociological tradition, and moving away from a conception of atomized actors.

But in his argument, there was hardly any room at all for particular people or relations; they were relegated to a minor and subordinate role in the conceptual scheme, and Parsons, for this reason, saw Durkheim's progression away from an emphasis on concrete relations toward vague ideas about the "collective conscience", as progress toward a higher level of argument, rather than just a higher level of abstraction.

The founders of network analysis, to some extent, were rebelling against this excessively abstract and oversocialized view of social life. In the Parsons-dominated atmosphere of the 1950's and 1960's when network analysis had its formative period, network analysis had to be rebellious and iconoclastic, since there was no room for it in the received wisdom. This explains, I think, some of the sectarian features of the earlier period of networking. And even now I 'm sure many of us think of ourselves as crusading outsiders.

This sense of a crusade has been salutary; it has helped sustain us through the period of consolidation, and brought us to our present strength -- this is the largest Sunbelt conference ever, and there is a veritable explosion of network-related writings. But I think it is time for us to take note that the Parsonian synthesis has long since declined in American social science, and this means that we should think about changing our stance.

If we remember that the insights of network analysis are not peculiar or sectarian, but in fact the rightful heirs to those put forward by the founders of modern social science, we can begin the task of reorienting social science research toward the proposition that no part of social life can be properly analyzed without seeing how it is fundamentally embedded in networks of social relations. In doing this, we need to remember that there are many scholars outside the house of social network analysis who think in a relational way but don't see the kinship with network methods and ideas. I see us as having a mission to join with these kindred souls.

There has long been dissatisfaction with the oversocialized notion that society is integrated by mental harmonies, and also with the undersocialized one that rational, atomized individuals, pursuing their own self-interest, explain all there is to know about social life. We as the self-conscious core of relational analysis are in a unique position to offer a solution to both kinds of dissatisfaction, and bring large numbers of others under our roof. This was part of my motive for undertaking the editorship of the Cambridge University Press series Structural Analysis in the Social Sciences -- to try to bring together both outstanding exemplars of network analysis, and also other relational work not previously thought of as belonging to the same school of thought.

So my message is that we have had an outstanding success as a separate method in the social sciences, but that there may be diminishing returns to this strategy. On the other hand, we are now in a strategic position to bring our insights to the more general social science community in a way that will reorient it in our direction. Many of us have already begun to do this. Just one look at our program will show how many papers take standard social science topics and demonstrate the power of a relational approach.

This does not mean we need to dissolve as a separate interest group, or that no one should continue to work on social network methods as such. On the contrary, it is exactly such work that lays the ground for what will eventually be our successful attack on the ramparts of orthodox, non-network-oriented social science. And when we have breached those ramparts and reached that plateau, there will be no one left who will have to stand before a group and declare: "I am not a networker". Instead, the slogan of the day will be "We are all networkers now!".

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What are we talking about when we talk about networking?

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In the 'Sunbelt X International Social Network Conference' in San Diego, Mark Granovetter gave a keynote about the myth of social network analysis, as a separate method in social science.

This keynote, other presented papers, and discussions on this conference made me think about myself and raised some questions. First, am I a networker? Or, why do I more often have the feeling that I am understandable at network conferences, more so than in other conferences? Why do I often feeling like I see obvious solutions where other people see only difficulties?

Of course, most people have questions like these. But, I believe that there is a system in the patterns leading me to these questions, and this system is strongly related to the question: 'What is networking?'

On the question of whether or not I am a networker: I started years ago as an electrician building copper networks for electric power. Then I studied electronic data transfer and data processing (circuit networks). Since 1975 I have been working in the area of social networks. I think in networks; I dream in networks; whether I like it or not, I am a networker.

But what is networking? From the discussions in **CONNECTIONS** and in **SOCIAL NETWORKS** and at conferences like the Sunbelt X Conference, I know there are different views. Maybe my view of networking is a very special and egocentric view. But, I think we should start to discuss such egocentric views on networking to understand in which areas these views overlap, and to understand why people do different things in our area and why 'networkers' sometimes have problems understanding each other and, especially, why non-networkers have problems understanding us.

So, let's start with my view on networking. For me, the main issue in networking is the change of a research paradigm -- the change from the almost narrow view on social elements, to a much broader view on relations between elements. To look at elements, or most times to look at features of elements, seems so instinctive that in most situations people tend to translate relations, or features of relations, into features of elements.

For example, I worked for several months in a population study center. Before the visit I believed that migration is a characteristically relational application. So, I had the idea of learning a lot about relational applications from people working on migration in the center. Once there, I learned to transform attributes or features of migration streams to elements. For example, if there is a migration stream from San Francisco to Detroit, this stream will be related as out-degree to San Francisco and as in-degree to Detroit. There are a lot of different indices for doing such transformations and people working hard to describe different aspects in such indices. I do not understand, why people press relational data in such way in a procrustean bed of element related indices.

My idea was to build a network between urban centers, build up all streams in one picture and look at the structural aspects of such a picture. Nobody there understood what I was talking about. In an example of international migration, I could show that in a star centered on the United Kingdom, 70% of migration information could be explained between 10 countries strongly related to the UK. I was very proud of the high degree of explanation with such highly restricted figure. The comment of a reviewer was: 'nobody goes from Australia to the USA over the UK, so forget it.'

After this visit, it seemed to me, that in the whole migration staff there was not one idea of relation and relational attributes, or of the structures composed by such relations. However, as a networker, I believe that with this kind of research you never get any relevant information on the real migration structure.

So, as H. Poincare told us for physics, looking on relations is looking on the real world. If people are looking at pure relations, maybe it is not enough to have a look at the real world. Often the possible attributes of relations are restricted to the two cases: a relation is there or is not there. Sometimes you find an extension of this view by using attributes of relations as categories 'not present', 'asymmetric' or 'symmetric'. But, of course, this is not the whole world. There are a lot of other different attributes that can be related to relations. Real relations can be labeled, can sometimes be scaled or ordered, and real relations are multiplex. So, unlabeled graphs may be far away from real relations. For me, unlabeled graphs are the very beginning of network analysis, not the aim.

Another concept often used in the area of networks is that of **structure**. For me, structure is a synonym for a set of information describing:

- a set of elements;
- a set of features or attributes of the elements;
- a set of relations between the elements;
- a set of attributes or features of these relations;

and most important:

- a set of restrictions on the previous named information,

so that you can describe a structure with a lower set of information than that given by the whole set of all single items. These restrictions in most cases are combination rules for elements and/or relations. Knowing these combination rules, which usually are implicit for a specific structure, one can construct the whole set of specific information out of the smaller set of structural information.

For example, you can describe the whole 4950 distances of 100 points in a two dimensional Euclidian space by the Euclidian combination rule:

$$d_{ij2} = (x_{ik1}-x_{jk1})^2 + (x_{ik2}-x_{jk2})^2$$

d = distance between i and j

x = coordinate of a point on one axis and the 200 coordinates of the points.

A transformation from the whole set of information into the smaller structural set of information seldom is without error, so perhaps one sometimes needs an error term. To speak about structure without such a restriction by combination rules seems meaningless to me.

If you look at the different papers presented at the Social Network Conference you can find different combination rules used. One of them is the additive combination of links, as it is used in graph theory.

Implicitly, this approach means that each element is like each other element, and that each relation is like each other relation, i.e., a pure structure approach. In pure structure as Borgatti and Everett defined it, the only difference between elements is given by their neighborhood. Or, elements are equivalent if their structural neighborhoods are equivalent. In this area an interpretation like: a two-step-link is twice a one-step-link is used. Neighborhood of the same elements and same relations is also used for detecting substructures, such as for a center of a star, or a gatekeeper, or for relations, such as bridges or triads of a specific form.

The other combination rule often used is given by a concept of local density. So in structures, one is looking for areas of local density. Such areas then define which elements are related to each other and could be combined into a new element. The next step is to look at a graph or structure of such new elements as an aggregation of the original.

Most of the frequently used combination rules are given here by equivalence, or automorphism, or isomorphism origins. These rules are usually restricted to equivalent nodes (elements) and cannot used for relations, or more complex substructures.

Here also, one can think of a complete world of different combination rules for information about elements and information about relations. If you are looking only on metric spaces, there are whole families of such combination rules, for example Minkowsky-metrics. Also, non-metric spaces are possible. And, in a social world there will be also a lot of combination rules not yet defined mathematically.

An extension of the structural (meaning static) view on the social world, is the analysis of dynamics. So, in a given graph time can be involved, e.g., by flows of goods along the lines of such a graph. On the other hand, the graphs themselves can be changed over time, for example, changes in triad census. Dynamics and especially the dynamics of graphs lead to another problem not yet solved, the problem of comparing structures.

If such comparison will be done yet, the examples are mostly demonstrations of stability or instability of 'gestalten'. Gestalt is a typical human-being-made-category. Only human beings, with their experience, can recognize a 'Gestalt' in a given pattern. And, in social science 'gestalten' are much more important than all other possible patterns.

In a dynamic approach, a lot of changes may happen before a 'Gestalt' will change. Also like in catastrophe-theory a 'Gestalt' may change abruptly, because the changing process cannot be described by a function. (See also system theory, changing of singularities.) So, it is quite obvious that using a simple similarity measure (like correlation coefficients), one get a lot of difficulties if one wants to describe changing structures.

These few ideas -- relation; structure; dynamics in and of structures -- indicate possibilities for changing the methodological paradigm in social sciences to networking. And also, they give a feeling that graph theory related to unlabeled points, and unlabeled lines and combination of lines to additivity, are more like a 'Glasperlenspiel' as the famous author Herman Hesse told it, than it is representative of the real social world.

To be successful, networking must offer help in collecting data on features of elements, features of relations, features of substructures, features of structures, features of dynamics in structures, features of change of structures; and in defining rule-sets for describing the restrictions in such sets of data which are the structural impact of the sets. Networking, or better, relational or structural, or best of all, system-related analysis is the field; we just have a flicker of the domain. So it's a lot to do. Let's start and not stop at the door looking fascinated at the wonderful doormat. Then, in the sense of Mark Granovetter, 'mainstream sociology' and 'networking' will be the same.

Any Colour You Like It

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Introduction

The concept of regular equivalence as introduced by White and Reitz (1981) provides a useful model for roles in social networks. The nature of the paper and the formulation of regular equivalence in graph theoretic and algebraic terms makes an appreciation of the idea of the concept difficult for the non-mathematician. In this paper we present an equivalent definition which is clearer and more useful for investigating regular equivalences. We shall initially introduce the concepts for graphs and will extend the technique to digraphs and networks. Fundamentally regular equivalence embraces the concept that actors who play the same role do so because they have relationships with actors playing equivalent roles. Two doctors are equivalent because they have the same relationship with patients, nurses, etc. They do not have the same relationship with the same individuals but with groups of equivalent individuals. The major difficulty with the concept of regular equivalence is that the definition considers not only the individuals but groups of equivalent individuals and the relationship between the individuals compared with the relationship between the groups. This makes the concept difficult to visualise. Our solution to this problem is to identify groups with different colours.

A colouring of a graph G is simply an assignment of colours to the vertices. Note that at the moment we do not insist that there are any rules as to how the colours are assigned.The graph in figure 1 has been coloured using the colours red, green and black.

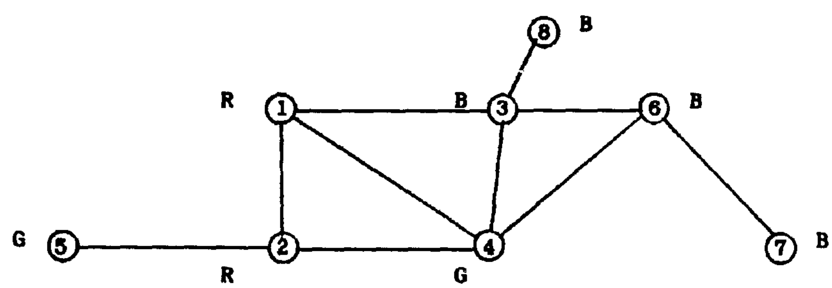

Fig.1

The vertices have been labeled so that vertices 1 and 2 have been coloured red; 4 and 5 green and the remainder black.

The colour set of a neighbourhood of a vertex is the set of all colours adjacent to a particular vertex. We shall denote the colour set of a neighbourhood of a vertex x by CS(x). Hence in Figure 1

CS(1) = green, black
CS(3) = red, green, black
CS(7) = black.

Note that since we are dealing with sets CS(1) is simply green, black and not green, green, black, i.e., we do not count 'multiple' colours.

Regular Colouring

A colouring is regular if, whenever two vertices are coloured the same, they have the same neighbourhood colour set.

In Figure 1 we note that vertices 7 and 8 are coloured the same and CS(7) = CS(8) = black. However there are other black vertices whose colour sets are not black, for example CS(6) = black, green hence this is not a regular colouring.

Alternatively consider the different colouring of the same graphs in Figure 2.

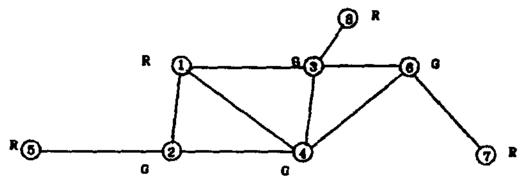

Fig.2

We see that the colour set of the neighbourhood for any red is simply green, i.e., CS(1) = CS(5) = CS(7) = CS(8) = green, and that the colour set of the neighbourhood of any green is green and red i.e., CS(2) = SC(3) = CS(4) = CS(6) = green, red. Hence, this colouring is regular and produces a regular equivalence, i.e., the equivalence classes defined by being the same colour form a regular equivalence. In this particular model 'reds' are characterised by only having relationships with 'greens,' whereas 'greens' always have relationships with 'reds' and other 'greens'.

This method makes it very easy to check whether any equivalence is a regular equivalence, and with a little practice it is a simple matter to generate your own regular-equivalences for a particular graph. It is also possible to prove some mathematical results (not presented here) which help in the understanding of regular equivalence.

Consider the graph in Figure 2, if vertex 5 is coloured red (as indeed it is) and vertex 2 is also coloured red then certain consequences are inevitable. The colour set of the neighbourhood is now red and so reds can now be connected to other reds, since 2 is now red it can only be connected to reds and hence the whole graph will eventually be red. This is a regular equivalence in which everybody is deemed to be equivalent (the algorithm REGE will produce this equivalence for any undirected graph). A consequence of this is that if a non-trivial partition is required then you cannot colour the entire neighbourhood of any vertex completely using the same colour as the vertex. Hence, if a vertex has degree 1 then for a non-trivial regular colouring the vertex it is adjacent to must be a different colour.

We can see some of the power of the colouring technique when we consider the following problem. For the graph in Figure 3 is there a non-trivial regular equivalence which makes vertices 1 and 4 equivalent? Before role colouring this would have been an awkward problem. If we colour 1 and 4 red than any colouring must make them equivalent.

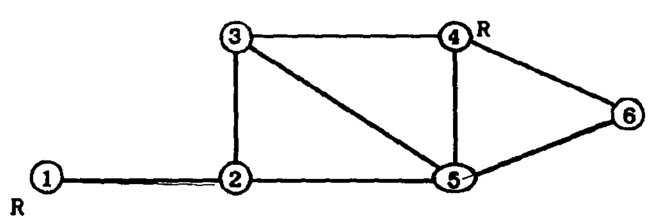

Fig.3

By the comments in the previous paragraph we must colour 2 a different colour, say green. It follows that reds can only be adjacent to greens so that 3, 5, and 6 must also be green. We note that with this assignment of colours CS(2) = CS(3) = CS(5) = CS(6) = red,green and that the colouring is regular. Hence the equivalence classes 1,4 and 2,3,5,6, are the only non-trivial regular equivalence which place together 1 and 4.

Any colour graph induces an image graph; the vertices of the image graph are the colours of the coloured graph, two colours being adjacent if any pair of colours are adjacent in the coloured graph. For example, Figure 4 is the image graph of Figure 1 and Figure 5 is the image graph of Figure 2.

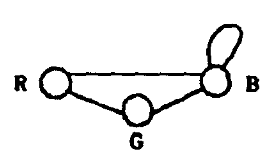

Figure 4

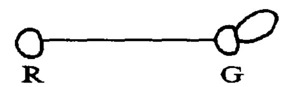

Figure 5

Note that in Figure 4 the edge between red and black does not mean every red is connected to a black but a red is connected to a black (in this case 1 is connected to 3). However, in Figure 5, a regular colouring, the fact that red is connected to green means that a colouring of a graph is regular if and only if the colour of the colours in the image graph, ie. colour of the neighbourhoods = neighbourhood of colours.

Digraphs and Networks

To extend the colouring technique to digraphs the only modification required is to consider the in-neighbourhoods and out-neighbourhoods separately. The digraph in Figure 6 illustrates the concepts required

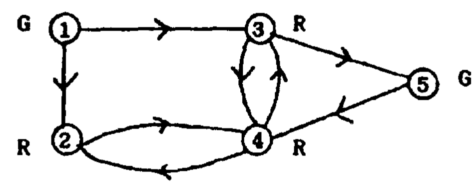

Figure 6

The out-neighbourhood colour set of vertex 1 is red, and the in- neighbourhood colour set of vertex 1 is empty, since 1 has zero in- degree. We use the notation $CS(1)_{out}$ = red, $CS(1)_{in} = \Phi$

Hence $CS(4)_{in}$ = red,green and $CS(4)_{out}$ = red

A colouring of a digraph is regular if whenever two vertices are coloured the same they have the same in-neighbourhood colour set and the same out-neighbourhood colour set. Figure 6 is regularly coloured since $CS(1)_{in} = \Phi$ and $CS(5)_{out}$ = red the digraph in Figure 7 is regularly coloured since reds are connected to yellows, yellows receive from reds and are connected to greens, greens receive from yellows and greens are connected to greens.

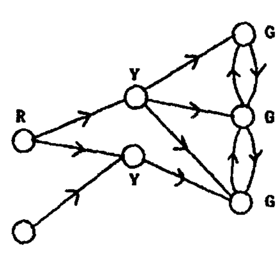

Figure 7

To deal with networks we simply insist that the colouring is regular on every relation. In addition if two or more image graphs are isomorphic then the relations associated with these images can be merged to form a network image. The network in Figure 8 has a regular colouring associated with the three relations E_1 E_2 E_3.

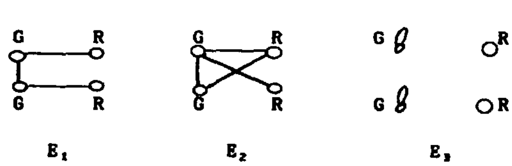

Figure 8

Figure 9 gives the three image graphs.

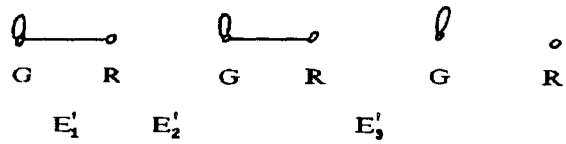

Figure 9

Since E_1 and E_2 are isomorphic they can be united to form the network image shown in Figure 10.

Figure 10

Role-Primitive Graphs

Any graph has at least two regular colourings ie. when every vortex is the same colour and when every vortex is a different colour. These colourings are called the trivial regular colourings. A graph or digraph which has no other regular colourings is called a role- primitive graph. (Note digraphs may not have the colourings in which every vertex is the same colour as a regular colouring, the definition is however, still valid). The existence of role-primitive digraphs is simple to prove. Figure 11 gives a role- primitive digraph on 3 vertices.

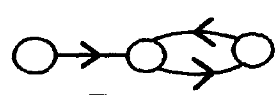

Figure 11

For graphs the problem is slightly more complicated, the smallest known role-primitive graph contains 10 vertices and is given in Figure 12. A similar graph with 12 vertices is also known to be role primitive.

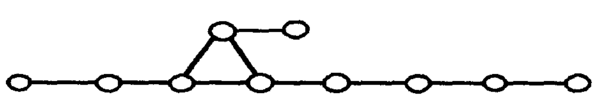

Figure 12

In fact it seems likely that Figure 12 is the basis of an infinite class of role-primitive graphs. The existence of smaller samples or other classes is an open question and the authors would be delighted to receive smaller role-primitive graphs- but be warned they are not easy to find.

REFERENCE

White D.R. & Reitz K.P. (1983). Graph and semigroup homomorphisms on networks of relations. *Social Networks* 5:193-235.

USING WORDPERFECT MACROS TO BUILD A REFERENCE LIST

A Guide for Beginning and Experienced Users

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Centre for Urban and Community Studies, University of Toronto (July, 1988)

Introduction

WordPerfect "macros" are sets of standard WP commands which you can bundle together and name. Then, when you want to use this set of commands, all you have to do is ask WP to use the macro. It will do the rest, even if the macro contains hundreds of commands.

We have developed three macros to handle a tedious task of scientific writing: compiling an alphabetized bibliographic reference list of works cited in a text. Their use has increased our accuracy and reduced by a factor of six the time involved in preparing a reference list for a paper.

The first macro, CITES (including foot/endnotes), combs a text for standard author-date citations and compiles a list of all citations. The second macro, TIDY, cleans and alphabetizes this list. The third macro, ALT-R, copies selected references from a comprehensive bibliography to the reference list at the end of a paper.

This short paper describes the macros, tells how to create one and gives a step-by-step user's guide. It provides listings of the macros in both their WP 4.2 and 5.0 variants (so that you can create them yourself) and gives examples of their use. (The CITES macro will not work on versions earlier than WP 4.2 because such versions lack Extended Search to search notes.)

Macros

Using Macros: To use any WP macro, you usually hit the ALT-F1O keys. The screen then prompts you for the name of the macro. In this case, you would either enter CITES or TIDY.

The macros themselves are stored as small separate files, with the extension .MAC for WP 4.2 (e.g., CITES.MAC) or .WPM for WP 5.0 (e.g., TIDY.WPM). You can copy macro files just as you can copy any other files. You should keep them on the same disk or directory you keep your WP program files.

There are two ways to edit macros. The least complicated is to create the macro over again, with the same name. Then when you save it, it replaces the previous version. The more complicated way is to use the MACRO EDITOR (included in WP 5.0 but part of a separate Library package for WP 4.2) to edit the macro. The MACRO EDITOR is useful for long macros where you do not want to reenter everything just to make one change.

Creating Macros: Start by calling up WP as usual and calling up a paper. Start creating the macro by hitting CTRL-FIO. WP then asks you to define macro. Make up and enter its name (8 characters or less). For example, if you are entering the macro in Figure 2, start by calling it CITES. (Actually the name is up to you.) Then keep entering the commands shown in Figure 1. Finish things off by hitting CTRL-FIO again. The macro will now run whenever you call it. Deal with the second macro, TIDY, in the same manner.

We use a special WP naming feature for the third macro because it is used many times in one document. Its name, ALT-R, takes advantage of a special WP quick-calling feature for macros: macros named with the ALT key and a single letter can be used just by holding down the ALT key while hitting that letter (in this case, hold down ALT and hit R). When using it, there is no need to go through the usual routine of hitting ALT-F1O and entering the macro's name. When initially creating it, in response to the standard CTRL-F1O Define prompt, just hit the ALT key followed by the R key (either upper or lower case).

A Brief Description of the Macros

CITES: The CITES macro (listing in Figure 1) goes through a text (sample in Figure 2) and lists in a second document all of the parenthetical statements it finds. It lists one statement to each line (terminating with two Hard Returns) and cleansed of their parentheses (see Figure 3 for the results of CITES). It takes a few minutes to run on long papers, so be patient. (After it is finished, use Shift-F3 to switch between documents if you want to check the list with the paper.)

TIDY: The TIDY macro (Figure 4) separates several citations listed in the same parenthetical statement, but set off by semi- colons. It then removes much of the garbage CITES produces. The version shown in Figure 5 only cleans citations beginning with "e.g.," or "see". The one we actually use cleans a lot more, but we leave it to you to make up your own list. The macro concludes by alphabetizing the citations.

After running TIDY, hand cleaning with word delete [CTRL- Back-arrow] and line delete [CTRL-End] will remove parenthetical words and statements which are not citations, such as phrases embedded in the text. You should then create an alphabetized list by using WP's Line-Sort routine [hit: CTRL-F9 2 CR CR 1].

1: The version of CITES presented here will only work with the current version of WP. 4.2 (and presumably later ones). This is because only 4.2 has the Extended Search feature [Home F2] which searches foot/endnotes as well as the main body of text. Users of earlier versions can modify CITES by eliminating the term "Home" from the first line of the macro. This transforms the Extended Search into s simple search using the F2 command. However, each foot/endnote will then have to be searched separately.

2: CR stands for "Carriage Return" or "Enter" on the keyboard.

On the rare times when a writer refers to an author in the text and only puts the authorship date in parentheses, CITES will only find the date and TIDY will move the date to the top of the alphabetical list (Figure 5). A search on the dates in the original document will quickly find the authors' names, to be copied to DOC 2 and alphabetized through another Line-Sort.

One caution is that this alphabetization does not list multiple papers by the same author in order of ascending date. Because it alphabetized only on the first author's last name, it intermixes multiple-authored papers with single-authored papers. This calls for some alertness list in using TIDY's list.

ALT-R and REF: Writers can quickly use TIDY's alphabetized list to prepare their reference lists. When writers frequently reuse the same references in multiple publications, they can use a third macro to copy needed references from an alphabetized reference file (we call ours REF) to the reference section of any given paper (whether or not the paper has been previously processed by CITES and TIDY). The REF file this macro uses may either be created independently or it can grow cumulatively through block copying from reference lists of papers.

New references in the REF file should be prepared in the standard form in which you customarily prepare references. When entering references, separate each reference with two Hard Returns (as usual). Then, WP's Paragraph-Sort will keep the reference list alphabetized after new ones have been added [CTRL-F9 2 CR CR 7 3 1].

The payoff comes in future papers. Print the product of CITES/TIDY, prepared as above. The paper itself should be one WP document, with the cursor set to the beginning of the reference list to be constructed at the end of the paper. The REF file should be the other WP document.

With the screen switched [Shift-F3] to the REF file, move the cursor to anywhere in the first citation mentioned in the alphabetized CITES/TIDY list (in our example, Berkowitz 1982). The ALT-R macro (Figure 6) copies the complete reference from the REF file to the reference list of the paper (Figure 7), moves to the proper location for the next entry in the reference list, pauses to let the writer verify things, and returns to the REF file ready for the writer to move the cursor to the next citation mentioned in CITES/TIDY.

When the CITES/TIDY list contains a new citation not found in the REF file, this should be entered into the REF file by hand at its proper alphabetic location and then copied with ALT-R to the paper's reference list. In this way, the REF file will grow cumulatively. Ours now has 700 entries after six months' use.

1: One way to avoid hand cleaning is to use "{ }" instead of "( )" to set off citations and modify CITES to search for "{ }". (An unconditional search-and-replace will change the text "{ }" to "( )" after TIDY is run.) However, experience shows that hand cleaning is safer because focused writers often forget to use "{ }" when preparing a text.

BRIEF USER'S GUIDE

1. Make sure CITES, TIDY and ALT-R macros are on WP disk or directory. (Keep them there permanently.)
2. Load text of paper into WordPerfect DOC 1 as usual.
3. ALT-FIO CITES generates the initial list in DOC 2. CITES takes a minute or two to run. The list created usually needs cleaning.
4. Use Shift-F3 to switch to DOC 2 which contains the list CITES created.
5. Go to top of DOC 2's CITES list [Home Home Up-arrow).
6. ALT-F1O TIDY cleans most of this list.
7. Hand-clean the rest, using word-delete [CTRL Back-arrow] or line-delete [CTRL-End].
8. Do a line-sort to alphabetize this cleaned list: [CTRL-F9 2 CR CR 1].
9. Print the cleaned, alphabetized list, and exit DOC 2 which contained the list on screen -- but stay in WordPerfect [F7 N Y].

10. You are now in DOC 1. Move cursor to end of your original paper (or wherever you want the paper's list to begin).
11. Switch back to DOC 2 (now a blank screen) and retrieve REF file [Shift-FlO REF] to DOC 2.
12. Find first entry in printed CITES/TIDY list, and move cursor to anywhere in the equivalent complete reference in the REF file.
13. Hit ALT-R: The reference will be copied to its proper place in the original paper (DOC 1), and the cursor will return to the REF file (DOC 2).
14. Find second entry in printed CITES/TIDY list, and repeat steps 12 and 13. Repeat until list is complete.

FIGURE 1(a): CITES Macro (WordPerfect 4.2)

<Home F2 (F2>	Extended search #or left parenthesis
<Alt-F4>	Start block
<F2) F2 Back-space>	Find the next right parenthesis; go back 1
<CTRL-F4 2 Shift-F3 CTRL-F4 5>	Copy parenthetical block to Doc 2
<Home Home Down-arrow CR>	Go to end; go to next line
<Shift-F3 alt-F10 Cites CR>	Return to Doc 1 and continue process

FIGURE 1(b): CITES Macro (WordPerfect 5.0)

<Home F2 (F2 >	Extended search for left parenthesis
<alt-F4>	Start block
<F2) F2 Back-space>	Find the next right parenthesis; go back 1
<CTRL-F4 1 2 Shift-F3 CR>	Copy parenthetical block to Doc 2
<Home Home Down-arrow CR >	Go to end; go to next line
<Shift-F3 alt-F10 Cites CR>	Return to DOC 1 and continue process

FIGURE 2: Sample Text

This is standard text with a citation (Wellman 1979) and a list of citations (Granovetter 1973, 1974; Fischer 1982). Minor difficulties occur when dealing with references to names such as Burt in the text (1986), and with (parenthetical comments), annotated citations (e.g., Berkowitz 1982) and multiple authorships (Wellman and Berkowitz 1988).

FIGURE 3: Product of CITES from Figure 1 TEXT

Wellman 1979
Granovetter 1973, 1974; Fischer 1982
1986
parenthetical statements
e.g., Berkowitz 1982
Wellman and Berkowitz 1988

FIGURE 4: TIDY macro (WordPerfect 4.2 and 5.0)

<Home Home Up-arrow>	Go to beginning of CITES' product
<alt-F2 n ;[space] F2 CR F2 >	Replace semi-colons with Return to put each citation in list on a new line
<Home Home Up-arrow>	Back to the top
<alt-F2 n e.g.,[space] F2 >	Find and delete "e.g.,"
<Home Home Up-arrow>	Back to the top

[Repeat last 2 steps as needed for other common phrases: "see" "i.e.," etc.]

< CTRL-F9 2 CR CR 7 2 1 >	Do line-sort to alphabetize

FIGURE 5: Product of TIDY from Figure 3 CITES

1986
Berkowitz 1982
Fischer 1982
Granovetter 1973, 1974
Wellman and Berkowitz 1988
Wellman 1979

FIGURE 6(a): Alt-R macro (WordPerfect 4.2)

< CTRL-F4 2 2 >	Copy citation as a paragraph block
<Shift-F3 CTRL-F4 5>	Shift to text document; retrieve block
<Home Home Down-arrow >	Go to end of text document
<CTRL-PgUp 15 CR>	Pause to check transfer
<CTRL-PgUp 255 CR>	Return to normal speed
<Shift-F3>	Back to REF file

FIGURE 6(b): ALT-R Macro (WordPerfect 5.0)

<CTRL-F4 2 2 >	Copy citation as a paragraph block
<Shift-F3 CR>	Shift to text document; retrieve block
<Home Down-arrow>	Go to end of text document
<Shift-F3>	Back to REF file
<CTRL-F10>	Saves macro called ALT-R
<CTRL-F10 ALT-R 2 2>	Reenters ALT-R via the macro editor
Move cursor to after {Home} {Home} {Down} command on screen	
<CTRL-PgUp>	Calls macro commands menu
<Down-arrow {WAIT} 15*>	Inserts 1.5 second wait in macro
<F7>	Saves edited ALT-R macro

FIGURE 7: Reference List from REF file for text in Figure 1

Berkowitz, S.D. (1982). *An Introduction to Structural Analysis: The Network Approach to Social Research.* Toronto: Butterworths.

Burt, Ronald. (1986). A note on sociometric order in the general social survey network data. *Social Networks* 8,149-174.

Fischer, Claude. (1982). *To Dwell Among Friends*. Berkeley: University of California Press.

Granovetter, Mark. (1973). The strength of weak ties. *American Journal of Sociology* 78,1360-1380.

Wellman, Barry. (1979). The community question. *American Journal of Sociology* 84,1201-1231.

Wellman, Barry, & Berkowitz, S.D., eds. (1988). *Social Structures: A Network Approach.* Cambridge: Cambridge University Press.

Abstracts :

Sunbelt Social Network Conference, 1990

Session A: AIDS, Bay Room
Chair: **H. Russell Bernard**, Department of Anthropology, University of Florida

"A SOCIAL NETWORK APPROACH IN EPIDEMIOLOGIC RESEARCH: THE EL PASO (COLORADO) STUDY"

A. S. Klovdahl, J. Potterat, D. Woodhouse, and W. W. Darrow

The concept of a social network provides a fruitful way of conceptualizing the structure of a population through which infectious agents transmitted by close personal contact may spread. A network model has been implicit in some epidemiologic research on sexually transmitted diseases (e.g., Potterat et al., 1985), and in the earliest attempts to determine if the Acquired Immune Deficiency Syndrome resulted from an infectious process (Auerbach et al., 1984). The potential usefulness of an explicit social network approach for understanding the epidemiology of AIDS (and other infectious diseases) also has been considered more fully (Klovdahl, 1985). The purpose here is to describe a prospective epidemiologic study that examines the relationship between the structure of a large urban social network and the location of infection (HIV, HSV, etc.) and to report some preliminary results. The population chosen for study was an at-risk largely heterosexual population consisting of prostitutes, their clients, IV drug users, and various partners. Also discussed is the manner in which the longitudinal design of the study will make it possible to detect significant flows of infection in the population of interest, to identify central sources (persons/positions/roles) in the disease transmission process, and to detect key bridges connecting the at-risk, infected region of an urban social network to the surrounding regions in the relevant population.

"ESTIMATING THE SIZE OF EVENT POPULATIONS: AIDS AND HOMICIDE VICTIMS IN THE U.S."

Eugene C. Johnsen, H. Russell Bernard, Peter D. Killworth, and Gene Ann Shelley

Laumann et al. (Science 244 (1989), 1186-1189) reported the results from their part of the 1988 General Social Survey conducted to assess the accuracy of data on the incidence of AIDS in the U.S. population, collected by the Centers for Disease Control and published in the AIDS Weekly Surveillance Report, and of corresponding data for willful homicides during the most recent one-year period, published in the Unified Crime Report and the Vital Statistics of the United States. They compared their data with the AWSR, UCR, and VSUS figures by sex, race, ethnicity, age, and region of the U.S. Their data for homicide victims are reasonably similar to the UCR and VSUS figures for all these categories, whereas their data for AIDS victims are reasonably similar to the AWSR figures only for sex and age. Beyond this is the question of whether official total figures for AIDS and homicides are reasonably accurate. Some believe there is significant undercounting of the incidence of AIDS. Here we investigate this issue using a simple mathematical model in social networks, some elementary social theory, and recent estimates of personal network size in the U.S. by the authors. We discuss the difficulties encountered by analyzing data and results obtained in an earlier study of personal network size conducted in Gainesville, Florida. On the basis of our analysis, we do not detect significant undercounting of either population.

"NETWORK STRUCTURES AND DIFFUSION: AN AIDS EXAMPLE"

Martina W. Morris

This paper presents an integrated framework for analyzing the role that selective social mixing plays in the spread of infectious disease. To the extent that the patterns of social contact differ from simple random mixing, the spread of disease may be slowed, and its impact on different subgroups in the population may be radically unequal. Log-linear models are used to describe the structure of a mixing-matrix and to integrate this structure into the standard epidemiological models for diffusion. Using a mixture of data and simulation, mixing structures are shown to have strong and varied effects on the spread of AIDS. In the first set of simulations, the basic dynamics of diffusion across a bridge is defined as a population that forms a link between two otherwise non-mixing (or minimally mixing) populations. The mixing groups for this simulation are defined by two stable nominal attributes: gender and sexual preference. Diffusion from the seeded to the remaining population is found to be quite difficult. With only a single bridge, and stable attributes that permanently define mixing group status, the infection tended to remain isolated, even under fairly extreme conditions. In the second set of simulations, patterns of spread are explored in a population where the missing groups are defined by an ordinal attribute that changes over time for an individual. The attribute used is age, cross-tabulated by gender. With this mixing group structure, the potential for spread was found to be much higher. Two regimes of transmission, one linked to the aging process and the other to patterns of sexual partnering, interacted to produce higher rates of diffusion.

"SOCIAL NETWORKS OF INTRAVENOUS DRUG USERS (IVDUS) AND HIV INFECTION: PRELIMINARY FINDINGS"

Susan Alperin, Richard H. Needle, Gregory Carlson, Keith Willard, and S. Susan Su

Variation in the seroprevalence rates of intravenous drug users (IVDUs) in different regions of the country and the disproportionate impact of HIV infection on certain racial and ethnic minorities has been explained by differences in the time when the virus was first introduced and became established in the particular population, and the greater prevalence of high-risk behaviors. These explanations, though valid, are not entirely adequate. We suggest that to further our understanding of the variation and spread of HIV infection, we need to examine the social networks of IVDUs. We report preliminary findings from our NIDA-sponsored project about social networks of IVDUs and HIV infection. Participants (intravenous drug users not in treatment) are recruited at the street level and through community agencies. Participants complete a standardized interview about their drug and sexual behavior, are encouraged to voluntarily take an HIV antibody test, return for counseling, enroll in interventions, and return six months after the initial contact. A semi-structured interview instrument has been developed to tap relevant network characteristics of IVDUs (e.g., centrality, clustering, hetero/homogeneity, density, roles). Social network data (N=60) will be linked with information on sexual and drug-using behavior from the other instrument and combined with HIV antibody data to help us better understand the potential for social network analysis as a basis for examining the spread of HIV infection among intravenous drug users (IVDUs).

"INTERPERSONAL NETWORKS AS PREDICTORS OF COPING ABILITIES: AN EXAMPLE FROM AIDS"

Rebecca L. Davis and Keiko Nakao

This research analyzes the effects of supportive relationships on a patient's ability to cope with AIDS. Fifty-eight support group attendees in the Los Angeles area were surveyed for the effects of the following variables on a person's coping ability: Support group participation, family support networks, and supportive networks outside the AIDS community. We found that the supportive networks of both the family and those persons outside the AIDS community are very beneficial to a patient's ability to cope with the stress and trauma of AIDS.

Session B: Organizations

Chair: **Daniel J. Brass**, Department of Management and Organization, Pennsylvania State University.

"NICHE AND NETWORK: STRATEGIC ALLIANCES IN COMMERCIAL BIOTECHNOLOGY"

Stephen R. Barley

This paper develops theoretical notions of how network analysis can be used to more concretely identify and specify the population ecologist's notion of an organizational niche. Data on the structure of the network of relations among organizations involved in the commercialization of biotechnology will be presented. In particular, the paper will examine the centrality and block structure of the network formed by equity holdings, joint ventures and licensing, marketing, manufacturing and research development agreements among dedicated biotechnology firms, diversified corporations, universities, and research institutes.

"EFFECTS OF NETWORK CENTRALITY ON PERCEPTIONS OF ORGANIZATIONAL CONDITIONS"

Herminia Ibarra

This paper investigates the relationship between individual's positions in organizational informal network structures and their work-related attitudes and perceptions. The focus is on three questions: (1) Does network position have an equal effect on different types of perceptions? (2) Do network effects help us explain the attitude-behavior link? (3) What are the causal mechanisms through which network links affect attitude formation? These questions are explored in a study which examined the effect of network centrality on both innovation behavior and perceptions of organizational conditions identified as encouraging or inhibiting innovation.

"PERSONAL, BEHAVIORAL, AND NETWORK SOURCES OF POWER: A COMPARISON"

Marlene E. Burkhardt and Daniel J. Brass

This study explores the relative contributions of personal attributes, behaviors, and network centrality on perceptions of power in an organization. Personal attributes included demographics as well as individual locus of control and self- efficacy. Behaviors were assessed using the Kipnis and Schmidt (1983) organizational influence strategies. In addition to the personal and behavioral variables, various measures of network centrality were calculated from the organization's communication network. Perceptions of power were regressed on these three sets of variables in order to compare their relative effects.

"WHO'S HOLDING THE NET?: REPRODUCING AND SUBVERTING THE SOCIAL ORDER OF ORGANIZATIONS THROUGH INSTITUTIONAL PATTERNS AND SOCIAL NETWORKS"

William B. Stevenson

The creation of social order, i.e., a consensual understanding about expectations that allows social life to take place, is conducted at two levels in organizations. At the macro-level of analysis, organizational forms with formal structures and formal positions are created, and, at the micro level, social networks develop through the conduct of work. At the macro level, social order is created mainly through the formal vertical and horizontal division of labor. This division of labor creates foci that facilitate interaction and barriers that inhibit interaction. At the micro level, networks of interaction are created that support or subvert the macro-ordering of interaction. Problem solving, information processing, and the exercise of influence within organizations are a function of the social resources, conceptualized as network ties, developed through an individual's position as defined by the formal structure and social network. A series of propositions are developed concerning how the two levels of analysis impact the social resources available to the individual and determine the patterns of social interaction within organizations.

"UNSTABLE FIRMS IN STABLE MARKETS, 1967-1977"

Shin-Kap Han

The stability of the distinctions and inequalities between markets does not preclude possibly unstable relations between firms within the markets. The social structure of the production relations defining markets and the shape of successful firms in the market can be stable despite the massive turnover in the population of firms transacting those relations. We propose a disaggregated way of looking at markets by treating them as the structural environments in which organizational dynamics take place. It is an apt application of an ecological point of view to see markets as niches. Using the 1967 and 1977 aggregate input-output tables with the data on large firms during the 1960s and 1970s, the sources of differential patterns of population change are examined. The structural characteristics of the niches and their network configurations conducive to the changes within the markets are discussed.

"WHY NETWORKING FAILS: DOUBLE BINDS AND THE LIMITATIONS OF SHADOW NETWORKS"

Charles Kadushin and Michael Brimm

Changes in the environment of complex organizations in the last 25 years include greater globalization and stronger tendencies towards the processing of information rather than the processing of things. Organizations have become more organic than mechanical, and have attempted to "delayer" and decentralize. Increasingly, observers tout the emergence of matrix and network organizations. Yet network organizations remain relatively uncommon. Detailed network analyses combined with qualitative observation and interviews with top managers in a high-tech global organization with divisions in Asia, the Americas, and Europe suggest that this organization typically tends to give conflicting messages about hierarchy, lateral communication, and relations with outsiders. By saying, "Please network, but don't you dare bypass authority," what Gregory Bateson called a "Double Bind" is created. We define, illustrate, and analyze four kinds of networks within complex organizations: Official (formal), social, shadow (the "real" way things get done), and career (the venue for so-called "networking") networks. The latter three, usually lumped together as the "informal" system, are alive and well, but because of double binds usually remain sufficiently underground or localized so as to render them incapable of carrying the burdens of modern multiplex global organizations.

Session C1: Social Influence
Chair: **Noah E. Friedkin**, Graduate School of Education, University of California, Santa Barbara

"EQUIVALENCE CONDITIONS FOR SOCIAL CONTAGION"
Ron Burt

Role equivalence and structural equivalence are contrasted as conditions for social contagion. The alternatives are discussed in theory to identify where they make contradictory predictions, then assessed in an analysis of doctors adopting a new antibiotic using data from the classic diffusion study, Medical Innovation. Scale-invariant role equivalence is stronger than scale-sensitive role equivalence in predicting contagion, but both are insignificant compared to the strength of structural equivalence. The problem for role equivalence lies in predicting contagion across structurally nonequivalent positions. Directly and indirectly, structurally equivalent people are likely to be aware of one another as substitutable. The awareness is a necessary condition for the role-taking mechanism presumed to generate equivalence contagion. For role equivalence to generate contagion between people playing the same role, but from distant positions in social structure, the people must be made aware of one another by other mechanisms. Evidence of role equivalence contagion among the Medical Innovation physicians is most clear for the physicians playing the most visible roles. The conclusion is that role equivalence can generate contagion not predicted by structural equivalence, but only in conjunction with other mechanisms ensuring that role equivalent people are aware of one another.

"NETWORK SAMPLING AND NETWORK EFFECTS MODEL"
Peter V. Marsden

The network effects model developed by geographers and introduced to social scientists by Doreian, Erbring and Young has become a prominent approach to studying influence processes and other situations in which responses are mediated by social networks linking actors. The model assumes that the network under study is closed; all units that directly or indirectly influence one another must be included in the data analyzed. If some units are not included, then biases in estimates are present; these are analogous to omitted variable bias in structural equation analysis. The assumption of closure is severe and could restrict the application of the model to relatively small systems of units. Little is known about the extent of bias induced by omissions of units from an analysis. This paper studies this problem by repeatedly sampling subsets of nodes from known data- sets, and ascertaining the nature and extent of biases produced by omission of units. Both simulated and empirical data-sets are used; simulated data-sets offer the opportunity to vary parameters--such as network density and the magnitude of the network effect--that are arguably related to the level of bias in estimates.

"RELATIONS AMONG RELATIONS: A BLOCKMODEL ANALYSIS OF FIVE INTERFIRM NETWORKS"
Mark S. Mizruchi and Helen M. Reid

In several recent works, Mizruchi examined the sources of similar political behavior among the 1,596 dyads created by relations among 57 large U.S. manufacturing firms. The dyadic analysis was designed to examine theories about the determinants of cohesion and conflict within the American business community. Most of the theoretical discussions examined in these analyses were couched at the level of the system as a whole, however, rather than that of dyads. In this study, we move the analysis toward the systemic level by constructing block-models of five interfirm networks: Similarity of political contributions, market constraint relations, common stock ownership by financial institutions, and direct and indirect interlocks. Blockmodels are derived from density tables computed (using STRUCTURE) from both Euclidian distances and correlations between firms' relational patterns. Common block membership in the similarity of political contributions networks is then regressed on common block membership in the market constraint, common stock ownership, and directorate tie networks using quadratic assignment. The study design enables us to compare the relative strength of predictions based on correlations and Euclidian distances as well as the strength of predictions based on common block membership as opposed to raw similarity scores. Substantive and network analytic implications of the findings are discussed.

"THEORETICAL FOUNDATIONS FOR CENTRALITY MEASURES"
Noah E. Friedkin

Three measures of actor's network centrality are derived from an elementary process model of social influence. The measures are closely related to, and cast new light on, widely used measures of actors' centrality. For example, the essential social organization of status that has been assumed by Hubbell, Bonacich, Coleman, and Burt appears as a deducible outcome of this social influence process. Unlike previous measures, which have been viewed as competing alternatives, the present measures are complementary and, in their juxtaposition, provide for a rich description of social structure. The complementarity indicates a degree of theoretical unification in the work on network centrality that was unsuspected.

"COHESION, EQUIVALENCE, AND SIMILARITY OF BEHAVIOR: A THEORETICAL AND EMPIRICAL ASSESSMENT"
Mark S. Mizruchi

For several years network analysts have debated the extent to which cohesion versus structural equivalence serves as a source of similar behavior among actors. Although the debate is ostensibly a theoretical one, many of the issues that separate researchers involve the operationalization of concepts. Using data on the contribution patterns of corporate political action committees, I examine the effect of various forms of influence on the extent to which firms behave similarly. My findings indicate that one's conclusions depend heavily (if not entirely) on one's operational definitions of cohesion and structural equivalence. Because the findings are consistent with either a role-taking or social influence perspective, resolution of this debate ultimately depends on the ability to identify the motives behind actors behavior. The concept of role equivalence provides a possible solution to this dilemma. My findings suggest, however, that unlike cohesive and structurally equivalent actors, role equivalent actors are less likely to behave similarly. Theoretical implications of these findings are discussed.

Session D: The Buffalo Symposium

Chair: **Noshir S. Contractor**, Department of Speech Communication, University of Illinois.

"COMMUNICATION NETWORK COHESION AND CULTURAL EVOLUTION"

D. Lawrence Kincaid

The purpose of this paper is to develop the concept of communication network entropy and to explore its relationship to cultural evolution. First, the entropy measure of network cohesion will be compared to standard measures of social network structure, such as density, connectedness, and betweenness, utilizing the same hypothetical network structure that Wiley and Brooks (1982) used. Then the cultural component will be superimposed upon the same hypothetical networks in order to explore the potential relationships between network and cultural change. Alternate social science theories will be considered in order to explain the dynamics of this relationship. We conclude with a discussion of the theory's strengths and weaknesses and its implications for future research.

"NETWORKS, STRANGE COMPLEXITY, AND PARALLEL TOPOLOGICAL DYNAMICS"

William D. Richards

This paper is about communication networks and complexity, the problems caused by the complexity, and solutions to those problems. One kind of complexity happens because networks have many members and even more connections between members. This type of complexity is exacerbated because there can be many kinds of relationships between people, and usually more than one kind happening at any given moment. Because we're familiar with this kind of complexity, it is called "normal" complexity. The other kind of complexity happens because the people in the networks are individual information processors. Each individual perceives, interprets, thinks, decides, and acts; at the same time other people are perceiving, interpreting, etc. Furthermore, the people interact with one another. The connection between the behavior of the individuals and the patterns their interactions form is the source of a type of complexity so different from normal complexity that it might be called "strange" complexity. Many of the difficulties caused by normal complexity are understood well enough to have been solved, at least in principle if not in practice. The difficulties caused by strange complexity have barely been recognized, let alone understood. These difficulties haven't been solved in principle, let alone in practice. This paper is about strange complexity. It explores the nature of this kind of complexity, and it describes some strategies and research tools that will help us understand the strangeness and to solve some of the problems the strangeness causes.

"TRIADIC COMPARISONS OF COMMUNICATION NETWORKS"

Frank Tutzauer

This paper discusses the general question of comparing two networks for structural similarities. We begin by reviewing the conceptual and theoretical issues involved in such comparisons, and then discuss relevant methodological tools, including the triad census. After highlighting limitations of current approaches, we outline the delta statistic and relevant research results regarding its distribution. We conclude with a discussion of future methodological approaches to comparing networks and what work needs to be done in order to provide a satisfactory answer.

"SPOT: AN INTELLIGENT, SELF-REFERENCING, CONVERSATIONAL NEURAL NETWORK"

Joseph Woelfel and William D. Richards

The rapid development of parallel data-processing models or "neural networks" has opened the possibility of developing PDP systems for the simulation of natural language conversations. Several communication researchers have suggested that two or more neural networks might be used to simulate a human conversation (Dorfman & Katz, 1989). Until now, however, no neural networks capable of carrying out even rudimentary conversations have been available. This paper describes a PDP program which can carry out rudimentary conversations, along the internal architecture necessary for the representation of words, patterns of words, sequences of patterns and self-referencing and monitoring. The self-referencing and self-monitoring aspects of the network may serve as the basis for development of a rudimentary self-concept.

"CORRESPONDENCE ANALYSIS: A METHOD FOR THE DESCRIPTION OF COMMUNICATION NETWORKS"

George A. Barnett

This paper first discusses the application of correspondence analysis for the description of communication networks. Correspondence analysis is a multivariate descriptive statistical method that makes possible the graphic display of the rows and columns of a categorical data matrix in the same low-dimensional coordinate space. When applied to network data, it allows for the simultaneous presentation of nodes as both sources and receivers or the joint display of nodes and the variables which differentiate the members of a social system. This improves the analysts' ability to interpret the communication structure of a social system or the structural equivalence of a set of nodes. This represents a significant advantage over other spatial models of social networks such as multidimensional scaling and factor analysis. We discuss the limitations of correspondence analysis and propose methods whereby the two general classes of network models, spatial and graph theoretical, may be considered as types of a more general type of network model.

"THE NET VALUE OF INFORMATION IN SEMANTIC NETWORKS: THE MESSAGE OF THE TRAVELING SALESMAN"

James A. Danowski

Goals (1) define the value of information, using a semantic network model with words as nodes and co-occurrences as links; (2) estimate the value of input messages; and (3) output revised messages, optimally tuned for value. We hypothesize that input message effectiveness increases with greater structural coherence with the aggregate network of weighted co-occurrences. Additional weights, for value, are applied from side information. Net value is the sum of the pair-wise products of: (1) pair co-occurrence weighted for two-step links, (2) value weight, and (3) activation decay weight for n-step activations. Tuned messages may be generated by using: (1) a neural network subgraph matcher, (2) a traveling salesmen network route optimizer, and (3) a grammar 'unparser' to create the best natural language expression. The optimal message may then be validated in an experimental design. The initial portions of this model are implemented via a word-network analysis of corporate annual report texts (n = 200), and a financial value criterion. Value weight is the correlation between stock price/earnings ratio and word pair co-occurences. Additional empirical examples use: (1) a behavioral measure of value, radio station market share; and (2) a subjective value rating, automobile customer satisfaction index (CSI).

Session E: Contagion and Social Networks
Chair: **James S. Boster**, Department of Anthropology, University of Pittsburgh.

"EMERGENT ASYMMETRIC BEHAVIOR: A SOCIO-COGNITIVE EXAMINATION OF ASYMMETRIC RELATIONSHIPS"
Kathleen Carley and David Krackhardt

Asymmetric relationships, such as all workers knowing the president of the company but only a few of the workers being known by the president, are a feature of most social situations. Yet the basis for, and consequent benefit of, such asymmetries at the individual and social level are typically overlooked. At the same time, we find that we are often unable to explain why changes occur in the underlying social structure. We suggest that understanding the asymmetries is important for explaining the scope of, and changes in, social structure and note that most theories do not offer an adequate explanation for, nor are able to predict, asymmetric behavior. In contrast, constructuralism is a theory of individual and social action in which there is a socio-cognitive foundation for both asymmetric and symmetric relationships. Indeed, such relationships evolve naturally via the same socio-cognitive mechanism as individuals interact and exchange information yet appear from an observers' point of view to play different roles in this diffusion process. We examine a series of hypothesis concerning interaction that derive from this theory. We are able to predict both who interacts with whom, asymmetries in interaction related behavior, and asymmetries in the expectation for, and memory of, interaction. The prediction of structural change is improved by taking asymmetries into account.

"COMMUNICATION PATTERNS AND COGNITIVE MAPS"
Karen Stephenson

This paper presents the preliminary results from 18 months of fieldwork and two communication network surveys conducted in a U.S. computer software corporation (NY SE). The two surveys were conducted approximately a year apart, before and after a major organizational change. The patterns of communication between departments are contrasted with personal interview data, individual drawings of organizational structure, and "official" organizational charts that were generated during the observational period. Comparisons are made between cognitive maps and flows of information using the Stephenson-Zelen information measure of centrality. The processes by which shared beliefs map onto social networks are also discussed.

"NETWORK RESOURCES, CONTACT RESOURCES, AND STATUS ATTAINMENT: STRUCTURAL AND ACTION EFFECTS OF SOCIAL RESOURCES"
Gina Wen-Foon Lai, Shu-Yin Leung, and Nan Lin

Social resources are conceptualized as having two components: Network resources and contact resources. Network resources are resources embedded in one's general networks and represent the pool of potential social resources that one may access. Contact resources are resources embedded in the contact that one uses in the job-search process and represent social resources actually mobilized for a specific instrumental action. Thus the former is considered as part of the structural sphere of one's social life, and the latter part of one's action sphere. Data from a community sample of employed males are used to analyze a series of models in which network and contact resources, along with personal resources, are assessed for their causal relationships as well as their relative effects on the attained status of the current job. Findings support our conceptualization of social resources and provide clues as to possible relative effects of ascription and achievement factors and of structure and action factors.

"HUMAN SOCIAL INTELLIGENCE AND ACCURACY OF INTERPERSONAL PERCEPTION"
Anita Iannucci

This paper reports a study of human social intelligence. Its aim is to determine the amount of knowledge that sorority members had of each other's personality traits. Eight sorority members ranked 20 of their best-known members on four characteristics: intelligence, physical attractiveness, assertiveness, and likableness. The Romney, Weller, Batchelder consensus model for rank-order data was applied. Strong agreement among subjects' rank-orders for the characteristics (.5 to .7 range) indicates that the rankers perceived consistency in the rankees of these four traits. Outside measures of two of the traits (intelligence and physical attractiveness) suggest the data are valid.

"OF PIGS, COWS, CHICKENS, AND SHRIMPS: COMMUNITY STRUCTURE AND COGNITIVE VARIATION"
Jeffrey C. Johnson and James S. Boster

This paper examines the contribution of social class to the pattern of intracultural variation in the judged similarity of meat products. Two snowball samples of residents in a small Midwestern town were selected, one starting from an upper-middle class resident and the other starting from a lower-middle class resident. Variation in judged similarity appears to be explained by the social class of the informants; upper middle class informants appear to have based their similarity judgments on nutritional characteristics of the foods to a greater extent than the lower middle class informants. Reasons for these differences in similarity judgment are discussed.

"A CATEGORICAL THEORY OF PRIMARY GROUP STRUCTURE"

Linton C. Freeman

Data on human interaction show that people more or less get themselves organized into clusters. Among the members of any particular cluster interaction is fairly common, but it is by no means uniform. Moreover, the boundaries between clusters are not absolute. Two individuals who are members of these different clusters often do interact--though probably less frequently--than do two members of a single cluster. Data on human cognition show that the people engaged in this kind of interaction have no trouble identifying these clusters. They are perfectly able to categorize themselves and those around them into bounded primary groups. They do, moreover, typically display considerable consensus about groups and their membership. The co-existence of these two kinds of data raises a problem: how do the participants construct well-formed cognitive categories of group membership out of messy data on interaction? This paper reports experimental evidence that bears on this problem. Based on that evidence, it develops an explicit theory of the process underlying people's construction of interaction-based group categories.

Session F: Methodology

Chair: **Keiko Nakao**, Department of Sociology, University of Southern California.

"DYNASCAL: A TOPOLOGICAL APPROACH TO ANALYZING CHANGE IN GROUP STRUCTURE OVER TIME"

Naohito Chino

A new topological approach is proposed for the analysis of change in group structure over time. Special force fields are defined operationally to explain changes in the structure, which are estimated by a method called DYNASCAL, given a set of longitudinal dissimilarity judgments such as longitudinal sociograms. These fields are presumably generated by interactions among individuals. For theoretical simplicity, these fields are supposed to be two-dimensional vector fields, which are described by a system of general nonlinear differential equations. Qualitative theories of the dynamical system such as those of singularities, bifurcations, and structural stability of the vector field are shown to be useful for describing qualitative aspects of the force fields. some difficulties in application of our method to empirical data are indicated and ways of overcoming them are discussed.

"NETGRAPH: AN INTERACTIVE NETWORK GRAPHICS PROGRAM"

Henry L. Cribbs and John M. Bolland

As one familiar with network analysis can attest, a picture is worth several thousand words: The graph of a network conveys more useful information (particularly to lay audiences) than prose alone can. Yet anyone familiar with network analysis also knows that drawing the graph of a network becomes tedious and time consuming as the number of vertices and edges increases. NETGRAPH is a BASIC program that assists this process. It allows the user either to construct a graph on the screen (based on an adjacency matrix that is input) or to input initial coordinates of the graph's vertices and its adjacency matrix; it then allows the user to move vertices on the screen and automatically redraws the graph for the new coordinates of vertices. Output options include ID numbers in the vertices and shading of selected vertices comprising cliques or blocks

"NETGRAPHS: A GRAPHIC REPRESENTATION OF ADJACENCY MATRICES AS A TOOL FOR NETWORK ANALYSIS"

Varghese P. George and Thomas J. Allen

Netgraphs are direct graphic images of matrices, drawn using a standard procedure that makes them effective for network analysis. The earliest graphic representations of networks, sociograms developed for sociometry, were unwieldy for large groups. Although several recent matrix-based graphic representations of networks overcome size problems, most of them portray just a single 'structure' in a network. Netgraphs incorporate four improvements. First, rows and columns are permuted (ordered) based on centralities of nodes. Second, rows and columns are further permuted (sorted) based on a set of attributes of nodes. Third, delineating lines are drawn to emphasize boundaries. Fourth, color is used to further differentiate the nodes. Thus, Netgraphs directly bridge networks to multiple structures and demography. Since they can be drawn for large matrices, they link "micro-macro" perspectives. They visually reveal three parameters of interest: Connectivities, centralities and centralizations. Examples of netgraphs based on an organizational communication network are presented. The network is represented by a graph theoretic adjacency matrix. We find a significant source of efficiency in the fragmented network. The highest communicators within the lowest structural groups are the ones most likely to communicate across such groups. Within such groups, however, high communicators coalesce into small clusters. Netgraphs can also be used for organizational design. Desired levels of interaction may be prescribed on a normative Netgraph. By superimposing actual behavior, they enable verifications.

"NETWORK ANALYSIS APPLICATIONS OF N-DIMENSIONAL DIRICHLET TESSELLATION AND DELAUNAY TRIANGULATION"

Gary S. Hurd and David Koizumi

Tessellation is a method of partitioning a manifold around labeled points such that all points in a partition are nearer the labeled point in the partition than to any other labeled point in the domain. The resulting polygons, called tiles, have properties such as area and slope (in 3space) which are readily computed and reflect the initial attributes used to define the labeled point. A subsequent mapping on D, the Delaunay triangulation, is formed by connecting those points which share a common edge in the tesselation. Depending on the attributes selected to define the labeled points, the triangulation can conform to observed network linkages, inferred linkage, or potential linkage. Observed network linkage may also be mapped onto the tessellation. Properties of the tiles may be conserved (i.e., slope) in the triangulation, or, like area, introduced in later analysis on the triangulation. The method is demonstrated using a fairly fast, PC-based program developed by the authors on two data-sets: (1) synthetic data from a hierarchical tree showing recovery of '"observed" network linkage and the use of tile area to infer a point's "rank" in the structure, (2) archaeological data on village location and size in conjunction with graph centrality measures illustrating the method's application to "central place" problems.

"UCINET 4"

Martin G. Everett and Stephen P. Borgatti

Work is currently underway to produce a new version of the network analysis package UCINET. The new version will differ from 3.0 in a number of important ways. First, there will be a new interface which is intended to make the package more user friendly. The editors will also be improved and will be based upon spread sheet concepts. Efforts are being made to incorporate computationally more efficient algorithms so as to allow for the analysis of larger data-sets. In addition, the package will contain more algorithms, remove the bugs in UCINET 3 and will be written in Turbo Pascal. There will also be a "help" facility. The present paper provides details about these improvements. One important task during the design process is that sufficient input is given by users and potential users of the system. We therefore welcome feedback from as many of the network community as possible.

"STRUCTURE OF RELATIONS AND HOMOPHILY: AN ANALYSIS OF SOCIAL NETWORKS IN CHINA"

Wen Xie

This paper begins with a distinction among three basic types of homophily--value-homophily, interest-homophily, and status- homophily. We believe that value-homophily and/or interest- homophily rather than status-homophily are the dynamics of social networks, and status-homophily is only the consequence of structural constraints. At the micro level, the structure of social relations of individuals determines individuals' role/status sets and their selections of social contacts from the people provided by the opportunity structure. Based on probability sampling data on discussion networks among Beijing residents in 1988, we draw all our theoretical arguments into a series of empirical tests. First, status-homophily is operationalized by adopting the analysis method of structural equivalence. The variation of status-homophily is analyzed along with five kinds of social relations, including spouse, parent/child, extended family, coworker, and extended social relations, in which discussion relations between respondents and their alters are built up. Finally, we investigate the relationship between the strength of social ties and status- homophily. In short, the results of the empirical tests show that the structure of social relations of individuals is the key to understand the phenomenon of status-homophily, and status- homophily is not significant in all kinds of social networks. It varies under different structural constraints. More important, the degree of status-homophily has little effect on the strength of social ties.

Session G: Science and Research Networks:
Case Studies from Emerging and Established Disciplines

Chair: **Leah A. Lievrouw**, Department of Communication, Rutgers University

Until recently, network analysts who sought to understand the social "reality" of science or other scholarly disciplines depended almost exclusively on bibliometric and sociometric methods, despite the enormous cultural and intellectual diversity of different research specialties. In more current studies, however, researchers have begun to use bibliometric and sociometric techniques in conjunction with other data-gathering and -analysis techniques, and to use traditional network analytic techniques in innovative ways, to gain more thorough knowledge of the social and intellectual contexts of the scholarly research world.

"MODELING AN INTERDISCIPLINARY RESEARCH ORGANIZATION AS A MEANING SYSTEM"

Noshir S. Contractor

Some organizational researchers (e.g., Van Maanan, 1979) have argued that coordinated activity is made possible as a result of individuals sharing a common set of meanings and interpretations. Others (e.g., Weick, 1979) have proposed that shared meanings, rather than being a precursor of coordinated activity, results form retroactive sense-making. A third group of researchers (e.g., Donnelson, Gray, and Bougon, 1986; Eisenberg, 1986) suggest that coordinated activity is possible in the absence of shared meaning by the process of developing equifinal meanings. Meanings are said to be equifinal if, despite their differences, they achieve similar outcomes. This paper proposes a network model to articulate and test the relationship between coordinated activity and shared meaning at an interdisciplinary research center. Coordinated activity is operationalized in terms of communication and collaborative research. Shared meanings is operationalized in terms of actual and perceived agreement about an interdisciplinary research center's mission. The organization of study is the Beckman Institute at the University of Illinois.

"THE USE OF ELECTRONIC COMMUNICATION TECHNOLOGIES IN SCHOLARLY COMMUNICATION NETWORKS AMONG ARTIFICIAL INTELLIGENCE RESEARCHERS"

H. Julene Butler

Scientific and scholarly communication has long relied on face-to-face and print media for interchange and dissemination of ideas, but the proliferation of electronic communication technologies (e.g., computer-mediated communication) has raised questions about the potential utility in the scholarly communication process. The discipline of artificial intelligence matured in parallel with the development of electronic communication technologies and has readily adopted them, making the field an ideal example for studying this phenomenon. This paper describes the communication patterns of academic AI researchers. Preliminary results from a pilot survey distributed to a selected group of AI faculty will be discussed. The survey addresses the researchers' communication, research, reading, and publication habits as they relate to traditional media and electronic technologies. Questions regarding the researchers' network relationships focus on the purpose, frequency, and media of communication between given individuals. Data will be analyzed in order to determine which aspects of the scholarly communication process lend themselves most strongly to electronic media. It is hypothesized that in a discipline such as AI, where the diffusion of technologies is extensive and user technological capabilities are high, electronic communication systems will be heavily used in both the conceptualization and documentation stages of the scholarly communication process.

"CONVERGENCE OR FRAGMENTATION IN COMMUNICATION AND INFORMATION SCIENCE JOURNAL-TO-JOURNAL CITATION NETWORKS, 1977- 1987"

Ronald E. Rice and Christine Borgman

Due to changes and debates in theoretical, methodological and technological emphases, several disciplines have been hotly debating their identity and future. Within communication research, the debates have centered around the different assumption of qualitative and quantitative methods, and the possible convergence of the interpersonal versus mass media subfields. Within information science, the debates have centered around the relative focus on library services versus information system interfaces. Because of the increasing importance of computer-mediated communication and information systems, the two fields have been showing evidence of overlapping research interests. Insofar as journals represent disciplinary institutions, possible long-term trends in convergence or fragmentation may be indicated in the journal-to-journal citation networks within and across these two disciplines. The present study applies network-analytic methods to 11 years of journal-to- journal citation data to identify any such changes and to test competing theories about these disciplinary changes.

"COMMUNICATION NETWORKS AND THE EVOLUTION OF A 'BIG' BIOMEDICAL RESEARCH SPECIALTY"

Leah A. Lievrouw

Among the various branches of science there are many examples of obscure interest areas that have successfully evolved into major fields of research. Sociologists and historians of science have pointed out the remarkable ability of such fields to attract and use personnel, money, facilities and other resources: in short, to be transformed into "big sciences" (e.g., Studer and Chubin, 1979; Latour, 1987). One such field is the study of human lipid metabolism. Over the last 40 years it has developed from a small subfield of biochemistry into a large and well-funded specialization supporting hundreds of research scientists and other personnel. Scientists studying lipid metabolism have been recent recipients of Nobel prizes, and one of the newest top- selling prescription drugs in the U.S. is a product of lipid research. As the basic science cornerstone of the current understanding of heart disease and atherosclerosis, this specialty has had enormous theoretical, clinical, and economic impact on virtually all other aspects of American medicine. In other words, lipid metabolism research is considered by many to epitomize the best qualities of "big" biomedical science, and it is argued here that effective communication has been an essential element in its growth. Lipid scientists' communication with colleagues inside and outside of their disciplines, with government agencies, foundations, and other funding sources, and with the public via the mass media all contribute to the growth of the field. In this paper, their specialty is examined using sociometric, bibliometric, survey and interview data, as well as historical evidence, to demonstrate the fundamental role of communication in the transformation of the field into a "big science."

"NETWORK MECHANISMS UNDERLYING THE DIFFUSION PROCESS: FRIENDSHIP AND INTERACTION IN A SCIENTIFIC COMMUNITY"

Alaina G. Michaelson

Diffusion of innovations is widely accepted to be a process which occurs over time through social networks. However, very few studies attempt to observe both adoption of practices and social networks through time. The present research is designed to examine explicitly the diffusion of innovations through social networks in a community of role analysts. Adoption dates of several innovations and the dates during which four social relations existed among the scientists have been recorded. Three of the relations measure interaction and one relation measures friendship. The results of the present study illuminate the effect that single and multiplex relations have on the diffusion process.

Session H: Organizations

Chair: **Peter Monge,** Annenberg School of Communications, University of Southern California

"IMPORTANCE OF INFORMAL AND FORMAL COMMUNICATION CHANNELS IN SPANNING PROFESSIONAL BOUNDARIES"

Judy Weedman

The present study examines the ties between three related but distinct professions to determine whether a boundary spanning communication structure could be said to link them, and if so, what its features might be. Such a structure was found to connect 82.2% of the survey respondents and to have both informal and formal components. The informal component was a social circle; the formal components were two journals and the conferences of a professional association. The relative importance of the informal and formal channels was assessed through two partial measures: numbers of individuals linked and perceived importance. Three additional dimensions were explored: the extent to which the structure functioned differently for the three professions, the differences in usage of the structure by central and peripheral individuals, and the use of the boundary spanning media compared to the use of group specific media. The three professions chosen for study function as cultural intermediaries; the nature of their work places them between the creation of works of art and the reception of those works by an audience. Editors, reviewers, and scholars of children's literature share subject matter and an analytic/evaluative approach to it, but the products of their work and their own audiences are different. The purpose of this paper is to explore the relative importance of informal and formal boundary spanning channels between these three distinct but related professions.

"NETWORKED COMPUTERS AND COMMUNICATION STRUCTURE"

Sabrina Searle and Sally Ann Law

This study is a secondary analysis of data collected in a field experiment in which 80 subjects were randomly assigned on two dimensions: (1) employed versus recently retired, and (2) electronic (having access to networked microcomputers) versus standard (having only standard office equipment). We compared the communication structure of the two groups over one year. Further, within the electronic group, we examined the influence of patterns of software use on communication structure over time.

"THE IMPORTATION OF NEWCOMERS: A TRIGGER FOR ORGANIZATIONAL SENSE-MAKING"

Laurie K. Lewis

Socialization of newcomers has long been considered an important issue in organizational communication. Current models of socialization focus on the assimilation experience of newcomers. Largely ignored in these models are the perceptions of tenured organization members in interpreting the importation of newcomers. Members make attributions about organization priorities, preferences and future plans based upon their interpretations of importation "trends." Drawing upon coorientation theory, social comparison theory, and social information processing theory, the present model articulates how the structure of social interaction becomes the basis for assigning meaning to importation. The present paper proposes an investigation of an organization's communication patterns and semantic patterns in order to discover how the system structure gives impetus to the process of sense-making.

"THE IMPACT OF SHARED UNDERSTANDING OF JOB ACTIVITIES ON JOB ATTITUDES"

Jana Bradley

This paper describes a study examining the extent of shared understanding between superiors and subordinates about the subordinates' job activities. We explore the relationship between various aspects of shared understanding, job satisfaction, and organizational commitment. Data were collected from all 38 employees in a small medical library in a midwest city. Participants described their job activities. They also described their superior's views of their jobs. These descriptions were content analyzed. Based on these descriptions, semantic network links were conceptualized for each superior- subordinate dyad. Links were operationalized using the coorientation measurement model. Three indices--agreement, perceived agreement, and accuracy--were computed. Preliminary results suggest that the subordinates' perceived agreement with their superiors was positively related to their job satisfaction and commitment. However, actual agreement and accuracy were not significantly related to satisfaction and commitment.

"COOPERATION AND CO-BROKERAGE IN THE MARKET: AN INVESTIGATION OF THE INVESTMENT BANKING INDUSTRY"

Joel Podolny

Economic and sociological accounts of markets typically view cooperative relations as either frictional or disruptive to the operation of the market mechanism. Atomistic competition, not cooperation, rules the market. This paper takes exception to this view and proposes that cooperative relations are often central to an understanding of market outcomes. Cooperative ties provide information and access to resources which might not otherwise be at a market actor's disposal; as such, they constitute a form of social capital through which market actors are better able to realize their interests. Through a comparative and longitudinal examination of manager/co-manager relations in primary security markets between 1981 and 1987, this paper explores this often overlooked dimension of market behavior. The link between inter-bank ties and the size and stability of market share is analyzed. Particular attention is paid to the co-manager role in an underwriting syndicate as a means by which a bank maintains and perhaps increases its share of the market.

"THE EFFECT OF PARADIGM DEVELOPMENT ON THE SOCIO-EMOTIONAL CONTENT OF ELECTRONIC MESSAGES"

Kelly A. Varerek and Carol Saunders

Despite previous claims that computer conferencing systems are cold and unemotional, we hypothesized that in an educational setting CC courses with higher levels of paradigm development would have higher socioemotional content in messages. The relationship is significant but in the opposite direction. No significant difference in task content is found.

Session I: Social Influence

Chair: **John A. Sonquist**, Department of Sociology, University of California, Santa Barbara.

"COMBINING THE 'ANTITHETICAL AND IRRECONCILABLE': THE USE OF ATTRIBUTE AND RELATIONSHIP MEASURES TO STUDY ORGANIZATIONAL COMMUNICATION"

Rudolf Neuhaus

Organization members can be studied either in terms of their attributes or their relationships with each other. These two approaches are often described by researchers as "antithetical and even irreconcilable." This paper describes the use of both attribute and relationship measures to study communication patterns in an organization. Twenty-nine respondents--seven top- level executives and their immediate subordinates in a technologically advanced organization--indicated with whom they communicated, how frequently, by what means, and on what issues (i.e., general administrative, general technical, product and procedure innovation, informal or social, and personnel). In addition, they also rated their company's success in communicating positive and negative information, as well as information related to innovation. The respondents also rated their satisfaction with their own communication with their superiors, peers, and subordinates. Network characteristics such as betweenness and degree were significantly related to measures of the organization's success in communicating with its employees and to satisfaction with communication. Also related to satisfaction were the respondents' position in the organizational hierarchy and their membership in other organizational subgroups. The relationship between individual satisfaction with communication and ratings of the organization's success in communicating will be examined. The implications of combining attribute and relationship measures in organization assessment will also be discussed.

"SOCIAL SUPPORT AND NETWORKS OF REFUGEES IN RURAL ZAMBIA"

Holly Ann Williams

Since 1964, Angolan refugees have been fleeing to Zambia. Contrary to Zambian law, many have chosen to settle in border villages rather than settling in a government refugee scheme. Little is known about self-settled refugees as they are a fugitive population. Forty-six recent (mean length of stay = 3.18 years) refugees were interviewed to determine (1) the kind of social and financial support they felt they needed and (2) the kinds of support they received. Data were collected to compare support needs and assistance provided at the time of entry and at the present time. Social support was examined in some detail in the context of social network data. This study was a first step in determining how social support and social networks may play a role in the adaptation of refugees after their flight.

"ON THE POLARIZATION AND CLUSTERING OF ATTITUDES IN SOCIAL GROUPS"

Bibb Latane and Andrzej Nowak

Computer simulations of an iterative, dynamic version of Latane's individual-level theory of social impact as applied to attitudes reveal the emergence of two group-level phenomena--polarization and clustering. Here we develop indices of clustering, explore the necessary and sufficient conditions for such emergence and consider the consequences for the study of public opinion.

"CONJUGAL ROLES AND SOCIAL NETWORKS: THE SIGNIFICANCE OF BOTT'S HYPOTHESIS FOR SOCIOLOGICAL THEORY"

Alexandra Maryanski and Masako Ishii-Kuntz

Over 30 years ago, Elizabeth Bott argued that the degree of role- segregation between husbands and wives is a function of the density of family social networks. Efforts to test Bott's hypothesis have resulted in contradictory findings, partly because of the conceptual problems in the hypothesis itself, methodological problems in operationalizing the hypothesis, and substantive problems in sorting structural effects from normative and other cultural as well as psychological variables implied by the hypothesis. The present paper offers a causal model of the key variables in Bott's model and applies it to two distinct data-sets. It is argued that the persistent appeal of Bott's hypothesis is seen to inhere in more general structural processes that the present paper seeks to formalize into a more testable set of propositions.

"COMMUNICATION NETWORKS AS PREDICTORS OF PERCEIVED PROGRAM EFFICACY"

Thomas W. Valente and Mary Ann Pentz

The present research analyzes community leader networks to explain variance in attitudes about current drug-prevention program practices and perceived drug-prevention program effectiveness. Centrality and connectedness scores for individual and subcommittee membership networks co-vary with perceived progress, however they do not co-vary with perceived support. Structural variables, such as organizational size and type, were used as controls. The implications for these results on drug abuse prevention programs is discussed.

"RELATIONAL DYNAMICS OF STRUCTURAL TRANSFORMATION: THE COMPLEMENTARITY OF LOVE/AFFECT AND POWER/CONTROL"

Raymond Travor Bradley and Nancy C. Roberts

This paper outlines a new theory of structural transformation by postulating complementarity as the order of interrelation that connects love/affect and power/control relations. Radical reorganization of social organization requires mobilizing and realigning enormous amounts of social energy (the potential for social action). The source of this energy is love. When patterned as communion, love fuses the group into an undifferentiated whole and releases the energy previously locked up as institutionalized structure. Released from structure or form, however, social energy is highly volatile and produces immense pressures towards instability. Counterbalancing the pressure from communion, a strong, collective order of power functions to harness and align the energy, thereby promoting group stability and enhancing the prospects for structural transformation. Results from a longitudinal analysis of the networks of relations within sixty urban communal organizations are used to ground key aspects of the theory.

Session C2: Human Service Systems & Networks: Substantive and Methodological Issues

Chair: **Joseph P. Morrissey**, Health Services Research Center, University of North Carolina at Chapel Hill.

"THE INTERORGANIZATIONAL DELIVERY OF MENTAL HEALTH SERVICES THROUGH A SERVICE IMPLEMENTATION NETWORK"

Keith G. Provan and H. Brinton Milward

Most past research on interorganizational relationships has focused on resource dependence motives. We argue that in some settings, this focus is inappropriate. Specifically, when attempting to explain linkages among agencies involved in the delivery of services that can be provided most effectively through a network of organizations, service dependence motives are thought to be paramount. Four service dependence hypotheses were tested against data collected from a network of 27 agencies providing services to adults with chronic mental illness (CMI) in a single city. Data were collected on the CMI service component of each provider agency, thereby focussing on a narrowly defined service implementation network. Results are generally supportive of the hypotheses for the two service linkage measures developed: service link density and multiplexity.

"COHESIVENESS AND EQUIVALENCE IN COMMUNITY MENTAL HEALTH AGENCY NETWORKS"

Robert Paulson, Joseph P. Morrissey and Michael Calloway

Cohesiveness and equivalence represent two different principles for identifying structure in interorganizational networks. This paper compares the structure in interorganizational networks in two urban community mental health and social support systems serving persons with a serious and persistent mental illness. The analyses are implemented with the STRUCTURE network analysis program. Discussion will focus on the relationship between major structural differences in two networks and their possible effects on the nature and operations of the service systems.

"MEASURING NETWORK STRUCTURE: OR WHY STRUCTURE AND CONCOR DON'T, AND WHAT TO USE AS AN ALTERNATIVE"

John M. Bolland

The question of system design has important implications for how community-based health and human service organizations provide services. Were it possible to design a model system, organizational roles could be established, and coordination could be achieved through those roles. But unfortunately, community- based systems tend to develop over time, with new organizational roles often ill-defined. As a result, the concept of structural equivalence makes little sense (since no two organizations may serve at all similar roles, conclusions based on structural equivalence are based on only weak associations), and network structure should be defined in terms of coherence instead. In this paper, I use data describing interorganizational relationships in two community health and human service systems, comparing the coherence of interorganizational relationships with their structural equivalence. In the process, I develop measures of fragmentation (and by implication, coordination) in the delivery of health and human services.

"CENTRALIZATION: FROM ACTION SETS TO STRUCTURED INTERORGANIZATIONAL NETWORKS"

Katherine L. Woodard and Patrick Doreian

The centralization and decentralization of systems is a property that has long been discussed, but rarely explored prior to the development and dissemination of network theory and methods. Even with these theories and methods, issues of centralization of community networks are more acute when there are different types of organizations having different affiliations, with varying degrees of permeability and malleability, and which obtain fiscal and political support from very different arenas. Each community organization has its basic tasks spelled out and participation in community networks is expressed through a combination of organizational resources and personal perception, taste, and style. We present baseline data for nine systems with varying degrees of centralization. Six of these systems face funding freezes or cuts within the next two years. This lays the foundation for interviewing administrators and staff from these systems in an effort to characterize changes in the structure of the service delivery system. The properties of centralized/decentralized systems will be discussed utilizing resource dependency theories.

"INTERORGANIZATIONAL TIE FORMALIZATION AS A DYNAMIC PROCESS"

Patrick Doreian and Katherine L. Woodard

This paper considers five degrees of formalization of ties between organizations: contractual; organization agreement; mandate; voluntary; and intermittent. Two of the ties, mandates and inter-organizational agreements, are instituted by extralocal actors (in most cases, state governments) to force the community service delivery system to close perceived crucial gaps. Contractual relationships are intended to serve to bind the network together on a local level and produce the best service at the least cost. Approximately 500 dyadic interactions, over four time-points for a rural county system, are used to assess the operation of these ties. Both the stability of exchanges, together with the emergence and disappearance of ties and actors from the network, are considered in an effort to formulate theories about the continual restructuring of social service delivery networks. The claim that knowledge about the continuity and efficacy of these ties can contribute to better policies and management strategies is assessed.

"COMMUNITY AND CORPORATE COMMITMENT: NETWORKS OF LOCAL POLITICAL PARTICIPANTS"

Jan V. Wilson

While the corporate model for community involvement links activity with position, a study in a large metropolitan area in Alabama shows networks may also be based on personal, rather than corporate, commitment. Using Bellah et al.'s Habits of the Heart as context, we illustrate theories of community through data collected in Huntsville, Alabama. Looking at the personal motivations of individual political participants and the networks through which they interact, we consider how communities develop and bring about change in health and human service delivery systems.

Session J1: Research Community Networks

Chair: **Rolf Wigand**, School of Public Affairs, Arizona State University

"COMMUNICATION NETWORKS AMONG RESEARCHERS IN TSUKUBA SCIENCE CITY"

James W. Dearing

An investigation of communication networks among researchers in Tsukuba Science City, Japan was conducted. Results indicate that the world's most concerted effort at planned science is beginning to pay off. Statistical and network analyses suggest that national research laboratories are increasingly interconnected, through co-author relations among researchers, and that their researchers are increasingly productive. The results of a survey of informal research study groups and case studies of specific communication strategies to increase scientific communication are reported. The present paper analyses (1) theoretical and practical problems in creating research communities, (2) strategies for increasing communication among researchers, and (3) the formation and change of networks among researchers in Tsukuba Science City.

"THE POWER OF COMMUNICATION NETWORKS IN ACHIEVING PUBLIC- PRIVATE COOPERATION: THE CASE OF THE EMERGING TECHNOPOLIS OF AUSTIN, TEXAS"

David V.Gibson and Everett M. Rogers

This paper emphasizes the importance of first- and second-level influencers from public and private sectors in the formation and emergence of the technopolis (high-tech city) of Austin, Texas. First-level influencers from state government, business and governing boards of universities empower second-level influencers from city government, local business, and university administration and professors to build communication networks across public and private sectors. Network influencers, cosmopolites, stars, bridges, and liaisons are identified in the different sectors of the Technopolis Wheel: The university and educational infrastructure; large and small businesses; federal, state and local government; support groups such as the chamber of commerce. Examples are given of coordinated, cooperative action through network development as well as cooperative action. Austin has evolved very rapidly in the 1980s as an emerging technolgy-city, attracting two important R & D consortia, the MCC (in 1983) and SEMATECH (in 1988).

"EXPATRIATE NETWORKS FOR TECHNOLOGY TRANSFER: THE CASE OF THE SILICON VALLEY INDIAN PROFESSIONALS ASSOCIATION (SIPA)"

Harmeet Sawhney and Arvind Singhal

The Silicon Valley Indian Professionals Association (SIPA) represents the approximately 6,000 Indian electrical engineers who work for U.S. high-technology companies in Silicon Valley. Established in 1986, SIPA's mission is to create technology bridges between U.S.-based Indians and their Indian counterparts, thereby fuelling India's high-technology industries. SIPA helps expatriate Indians to return to India with capital and state-of- the-art American microelectronics technology. Personal networks have enabled expatriate Indians (1) to convince their

U.S. high- technology employers to invest in India, and (2) to create their own high-technology companies in India. The purpose of the present paper is to analyze SIPA's role in transferring high- technology to India, especially focusing on the power of personal networks.

"NETWORKS AND EFFICIENCY OF KNOWLEDGE-BASED FIRMS"

Arent Greve

Knowledge-intensive firms are defined as firms with knowledge as a crucial input factor. To achieve efficiency, firms have to mobilize complementary assets. The present paper discusses the problem of pricing knowledge, which also affects the availability of knowledge in markets. Knowledge-intensive firms may require inputs connected to formal contracts (interorganizational networks) and they may need inputs which are difficult to define, and therefore difficult to search. This input may be available through personal networks of employees, therefore, firms operating in environments with rapid knowledge development and ambiguous input sources may depend on the personal networks of their personnel. The paper ends with a discussion of how internal organization of product development may affect internal coordination of knowledge resources.

"NETWORKING AND TECHNOLOGY TRANSFER IN RESEARCH TRIANGLE PARK"

William F. Little

The 6,000 acre Research Triangle Park (RTP), with 57 research organizations, 33,000 employees, and nearly 15 million square feet of construction, is the largest planned university-related research park in the U.S. RTP is based on three universities in three neighboring communities: Duke University in Durham, North Carolina State University in Raleigh, and the University of North Carolina in Chapel Hill. The goals were: To enhance the economy of the entire state through diversification, and to provide a new profile of employment opportunities in science and engineering for the state's youth. RTP was developed by the nonprofit Research Triangle Foundation (RTF) in 1958 entirely with private contributions from individual and corporate citizens to consolidate the partnership between the universities, the business community, and state government. While no state funds were involved, the state played several pivotal roles in the process. Ongoing linkages and networks were necessary between critical groups: Leaders and scientists at the three universities, leaders in state government, leaders from indigenous business and financial institutions in the state, and industrial and government leaders and scientists from RTP organizations. In particular, the university presence in the Park has been critical and was nourished. The present paper describes linkages that have been developed over three decades, some deliberately and some through evolution. These networks include the early establishment of the Research Triangle Institute; a natural growth of professional societies and associated activities; creation of the N.C. Board of Science and Technology, a state agency, in 1985; incorporation of the Triangle Universities Center for Advanced Studies, in 1975; service of mixed communities on boards of nonprofit scientific and scholarly corporations; informal group affinities; data-bases and electronic communications systems; physical facilities; quasi-political entities; publications; and other devices.

Session K: Politics

Chair: **Forrest R. Pitts**, 213 Arboleda Drive, Santa Rosa, CA

"CONSTRAINING NETS IN THE WORLD ECONOMY: AN APPLICATION OF THE CONCEPT OF STRUCTURAL AUTONOMY OF INTERNATIONAL STRATIFICATION"

Steve B. Andrews

World-system and underdevelopment theories of international stratification argue that the location a nation occupies in the structure of (economic) relations may constrain or facilitate certain options the national actors face regarding such decisions as internal development. This paper first reviews several theoretical and then structural approaches to describing the system of international stratification. Since the latter are not causal specifications, it is then proposed that using Burt's concept of structural autonomy allows a causal mechanism of international stratification to be specified. After reviewing Burt's theoretical framework as he develops it for a national product market, an analogous application is developed for the international trade market. Using data from the "World Export Data, 1948-1983" (Faber & Nierop, 1983), this model is then tested.

"WORLD SYSTEM POSITION AND ECONOMIC DEVELOPMENT AND PERFORMANCE"

Ronan Van Rossem

According to world-system and dependency theory, both a country's level and rate of development are affected by its position within the world system. The world system can be conceptualized as a multiplex network of relations among the nations of the world. This paper looks at three such relations between nations: trade (imports and exports), military relations (arms trade + presence of foreign troops), and political ties (the presence of embassies). Role equivalence analysis (based on triad frequencies) will be used to map these different networks. This approach allows us to study not only the effect of each of the different networks on economic development and performance separately, but also to look at the effect of incongruities between the positions in the different networks (blockage and/or transfer). In the past statistical studies of world system and economic development and performance have resulted in weak and contradictory results. In this paper the effect of network position on these characteristics will be examined.

"THE NETWORK BEHIND THE POWER"

Samuel Schmidt and Jorge Gil-Mendieta

Analysis of the Mexican experience reveals the existence of a network of power constructed during the 1910 Mexican revolution. This network allowed the system until today to sustain political stability through the control of the basic element of the political system: The presidency and the presidential succession. Through the network we can analyze the role of different actors in the political system such as the military and the incumbent president in the selection of the new president, thus keeping the country peaceful. We are also able to analyze the division of power geographically and in the public administration. In the present paper some subgroups of the network are presented in order to explain through time some of the internal changes in the networks. How has Mexico been able to sustain 62 years of political stability? What is the role of the military in the Mexican political system? These are examples of questions addressed in this paper.

"THE SOCIAL CONTEXT OF VOTER TURNOUT"

Bruce C. Straits

The present paper reexamines the classic interpersonal explanation of electoral participation. The analysis is based on log-linear modeling of published tabulations from the 1984, 1982, and 1980 November Current Population Surveys. The results support a contagion model of spousal voting. Turnout is higher among those living with a spouse than among other members of the electorate. The high association between husband's and wife's turnout noted in a 1956 presidential election survey (Q + .94), is found to be robust and stable over time. The relevance of these findings for contemporary models of electoral participation is discussed.

"ELITE CONSOLIDATION AND PARTY FORMATION IN RENAISSANCE FLORENCE: THE RISE OF THE MEDICI, 1400-1434"

John F. Padgett and Christopher K. Ansell

Elite marriage, economic, friendship, and patronage networks in Renaissance Florence are analyzed in order to understand the structure and the emergence of the Medici political party. Historically, we demonstrate an intimate connection between party organization in 1425-1434 and specific network mechanisms of oligarchic elite consolidation in the previous period. Anatomically, we reveal the social foundations for the Medici's achievement of extraordinary levels of organizational (and later state) centralization and control. Theoretically, we argue against group or collective action conceptions of politics on the grounds of demonstrable disjuncture between participants' cognitive categories of collective interests, on one hand, and their micro behavioral opportunities for mobilization, on the other. Instead, we develop a structuralist alternative based on cascading, and attributional heterogeneity.

"NETWORKING IN AFRICA"

Ayah Okwabi

The present essay examines the state of networking on the African continent, the ways in which individuals and organizations combine or make connections among themselves, what they seek to achieve by so doing; some concrete examples of this organizational form; a comparison of Mail Art and the Fourth World as practical expressions of it and the future of the total African network in relation to global networking. Schon in his work Beyond the Stable State defines a network as a set of elements related to one another through multiple connections. The metaphor of the net suggests a special type of interconnectedness, one dependent on nodes in which several connecting strands meet. There is the suggestion both of each element being connected to every other and of elements connecting through one another rather than to each other through a center. According to Vittore Baroni, an experienced Italian networker, "the world is full of dull robotic and passive human beings who serve a Higher Power of a materialist or ideological nature; to obtain the crumbs of an unreachable cake. The world is also full of very nice and interesting people, scattered in the most unthinkable places, emanating strange currents of energy that attract and inspire other like minded spirits." Baroni sees traces of such currents in magazines, books, records, faces and places. By networking, like minded spirits are able to cooperate more effectively.

Session L: Methodology

Chair: **Sue Freeman**, School of Social Science, University of California, Irvine

"THE ROBUSTNESS OF NETWORK PARAMETERS USING DIFFERENT SAMPLING TECHNIQUES"

Joseph Galaskiewicz

Practitioners who study large populations often are dissuaded from doing network analysis because of the real and not-so-real problems associated with network sampling. This paper reviews several questions which network sampling must address and presents data on six networks of different size and make-up. The four key questions which every network sampler must answer are: (1) should we sample nodes or should we sample dyads within a population; (2) what sampling percentage should we use; (3) does sampling affect scores (e.g., indegrees) of very popular and very unpopular actors the same as those who are moderately popular; and (4) how many trials do we need to derive dependable estimates of network parameters. Our exploratory analysis examines the network of money, information, and support among 73 organizations in Towertown and 104 organizations in River City. Our task will be to estimate the "true" indegree scores for each of the organizations in each of the six networks using different sampling techniques. Thus we will compute the indegree scores from the six networks for each actor and compare these true scores to computed scores based on samples from each network. These samples, however, will vary systematically. Some will be based on a sample of nodes; others on a sample of dyads. We will sample 25%, 50%, 75%, and 90% of the nodes/dyads to see what effect sampling percentage has on our estimates. We will look at the estimates for actors who are very popular and very unpopular to see if different sampling techniques affects all actors equally. And, finally, we will vary the number of trials from one to twenty to see at what point we get stable estimates of the true indegree scores. The present paper concludes by offering some guidelines which researchers might adopt when doing network sampling.

"BIASED NET THEORY: ALTERNATIVE SIMULATIONS" (L)

John Skvoretz

Rapaport's biased net theory is one of the earliest stochastic approaches to the representation of networks. It remains an attractive view because of its constructivist image that networks are built-up from local events of connection that have both biased and random components. Difficulties in analysis abound, however, and derivations must appeal to approximation arguments: One of the key assumptions is that analytical results for a network of average outdegree a are well-approximated by results from networks of constant outdegree a. My report examines two programs for generating networks in line with biased net formulations. One of these programs attempts to generate nets subject to specific bias factors and matching a target outdegree distribution. Previous research on this program (Skvoretz 1985, 1989) indicates (a) it tracks the Rapoport approximation equations well, but (b) it does not yield networks that fit the target distribution of bias values. This program is reexamined using a different procedure to estimate biases. Also examined is another net-generating program, one in which (other than the bias factors) the only constraint on network formation is that the total number of relations matches a target value. This latter approach is more successful on statistical grounds. It also fits better data from two networks presented by Coleman (1964). Finally, the success of the second approach calls into question the soundness of the Rapoport argument that results for variable outdegree nets can be approximated by those from constant outdegree nets.

"OVERLAPPING SOCIAL CIRCLES AND ORGANIZATIONAL DYNAMICS: MODELING THE RELATIONSHIP BETWEEN NETWORK TIES AND THE DURATION OF ORGANIZATIONAL MEMBERSHIP"

Miller McPherson and Pamela Popielarz

This paper presents empirical evidence in support of a dynamic theory of organizational evolution. The theory ties together basic images from social network analysis and the community ecology of organizations. A central hypothesis of this theory is that social network connections and co-membership in social organizations are co-evolutionary; that is, organizations generate network ties and these network ties mediate organizational growth and decline. Data bearing on this hypothesis come from an event history data-set of organizational memberships gathered in ten communities in summer, 1989. The hypothesis is strongly supported by the data: Sharing an organizational membership with a network alter (i.e., someone with whom the respondent "discusses important matters") doubles or triples the average duration of membership. Implications of the present findings for both the network and organizational literatures are discussed.

"MOTHERS AND BEST FRIENDS: ALTERNATIVE SOURCES OF SOCIAL SUPPORT FOR YOUNG MARRIED WOMEN IN SEVEN WESTERN COUNTRIES"

Scott L. Feld and J. Jill Suitor

The present study is one of the first to investigate how support from mothers relates to, or substitutes for, support from best friends. The present paper analyzes data on married women between the ages of 18 and 35 from seven Western nations (Australia, West Germany, Great Britain, United States, Austria, Hungary, and Italy). The use of mothers is shown to have priority over use of best friends for all of six diverse social purposes examined (help in the household, with illness, with money, with husband problems, with depression, and with advice). In addition, the proximity of mothers is a more important determinant of whether best friends are used than the proximity of the friends themselves; women with distant mothers are more likely to use best friends. In countries where mothers tend to live further from their daughters (e.g., Australia), best friends are used more often than in countries where mothers tend to live closer to daughters (e.g., Austria, Hungary, and Italy). Implications and directions for future research are discussed.

"NONPARAMETRIC INFERENCE FOR NETWORK DATA"

Kathleen Carley and David Banks

Network data exhibit row-column dependencies that invalidate traditional statistical analyses for group comparisons. Such analyses can lead to exaggerated significance probabilities, caused by sample size inflation and positive dependence within rows/columns. This paper uses restricted randomization to develop exact permutation tests for network data. This enables nonparametric inference for group differences and pre-specified group orderings. These methods are demonstrated by examining three different data-sets extant in the literature, Carley's Tutor Selection data, Homan's Bank Writing data, and Samson's Monastery data.

"ON POSITION AND STRUCTURE IN STRUCTURAL THEORY"

Stephen P. Borgatti and Martin G. Everett

In recent years, the dual notions of network position and structure have increasingly been used as independent variables in sociological theorizing. In this paper we suggest that there are two fundamental views of position (of which most others are variants), one based on so-called structural equivalence and the other based on graph isomorphism. We refer to these approaches as location-based and pattern-based, respectively. The difference between the two approaches can be traced to different underlying conceptions of structure, which in the location-based approach can be represented by labeled graph, which in the pattern-based approach can be represented as an unlabeled graph. Both approaches have their uses, but we argue that the location- based notion of position does not form a good building block for structural theory because it requires actors playing the same position to know exactly the same alters, hence confounding structural factors with such extraneous factors as sharing contact with specific individuals who may have specific effects on those who know them. In short, structural equivalence is not structural. In contrast, the pattern-based notion of position makes no reference to individual actors: Isomorphic actors are identical with respect to every structural property imaginable, yet they are not required to run in the same social circles. Hence, the pattern-based approach is better suited as a building block for structural sociological theory.

Session J2: Network Studies in Various Cultures

Chair: **Nan Lin**, Department of Sociology, Duke University

"BUREAUCRACY AND SUPPORT NETWORKS IN HIGH TECHNOLOGY MANUFACTURING"

Andrej Rus

Many high technology firms adopt a matrix structure to avoid rigidity of bureaucratic authority and encourage coordination and information flow beyond the strict limits of functional hierarchy. The result is a multiple command structure in which vertical and lateral channels of information and authority operate simultaneously. In order to successfully realize their projects, managers in such a firm have to rely on contacts outside their hierarchy. This is presumed to diminish the importance and change the character of direct supervisory relations. Using network data and personnel records on a representative sample of middle managers in one of America's largest high technology firms, we show that this does not happen. In the absence of a bureaucratic certainty about their position, managers create one for themselves by establishing complex ties with their direct supervisors while maintaining only specialized ties with those whom they deem to be important to their projects or co-workers. We may conclude that while matrix gives opportunity to act independently it also implies a high level of uncertainty for participants. It is the latter, rather than the former, to which managers respond.

"DEVELOPMENT AND NETWORK STRUCTURES IN YUGOSLAVIA"

Hajdeja Iglic

(No abstract available)

"MARKET STRUCTURE AND PERFORMANCE IN JAPAN AND THE U.S."

Yuki Yasuda

This paper explicates the structural condition of the United States and Japanese production markets using the 1985 U.S.-Japan input-output table. First, the differences and similarities of markets in the two countries detected by the patterns of ties industrial sectors hold are shown and analyzed. Second, the effect of network properties on market performance of industrial sectors of the two nation is estimated. The analysis shows that although the production technology of two nations are similar, the Japanese production market is unique in its high domestic density and its structure whose composing sectors are free from negative interaction effect of constraints. About 65 percent of the variance of market performance can be explained by network properties with some adjustments in the cross-national context.

"WORK AND SOCIAL NETWORKS IN URBAN CHINA"

Danching Ruan and Peter M. Blau with Lu Zhou

This paper reports the findings of the first large-scale social network study in urban China. It analyzes the data of discussion networks from a sample of about 1,000 employed residents in Tianjin, the third-largest city in Mainland China. The results are compared with the social network data from the American General Social Survey (1985). The present results show that the Tianjin networks have a high degree of homogeneity in social attributes and relational density among the social network members. A predisposition to choose close associates with attributes like one's own (homophily) is observed. Disproportionate numbers of these associates are kin and coworkers, with the latter as frequently mentioned as the former. In comparison to the American discussion networks, the Tianjin networks are typically larger, and exhibit more social density, homophily, and homogeneity. Kinship relations are important in both samples; but workplace relations are more important in the Chinese discussion networks than in the American discussion networks. The authors analyze the differences between the Chinese and American social networks in terms in terms of the macro-social structures of the two countries. The focus is on the organizational aspect of the Chinese social structure, which is marked by its extremely low degree of job mobility and the unusually broad role played by the workplace in the life of the Chinese, and which provides a unique opportunity structure for the formation of social networks in urban China.

Session M: Resources and Exchange

Chair: **Jonathan Turner**, Department of Sociology, University of California at Riverside.

"POWER IN EXCHANGE NETWORKS: A NEW APPROACH"

Elisa Jayne Bienenstock and Phillip Bonacich

Recently, there has been some interest in discovering an algorithm to determine which positions in an exchange network yield the most power. The theoretical foundation of this type of work can be traced to Homans, whose principle of least interests predicts that in a dyadic relationship the person with the least to gain from the relationship has more power. Emerson found a similar relationship between power and dependency which he later extended to networks. The person with the most power in a dyad is the one who is less dependent on the trade. Several researchers have tried to come up with an algorithm to determine where coalitions in networks would occur and which positions would have advantage in the coalitions. Cook et. al. came up with point line vulnerability. Markovsky et. al. used a measure of connectedness to determine power. Both of these models seem to assume rational choice, but neither does so explicitly. Another branch of social science, N-person cooperative game theory, is strongly founded in rational choice and has several solution concepts for determining coalition structures and dispersement of side payments within coalitions. These solutions: The Core, the Kernel, the Bargaining Set, the Shapely Value, and other solution concepts can be easily applied to network structures to determine positions of power within networks. The experiment we plan will distinguish between these different theories so that we can compare them in order to gain insight into predicting how coalitions form in networks and which positions have the most power.

"THE INTERACTION OF STRUCTURE AND STRATEGY IN NEGATIVELY CONNECTED EXCHANGE NETWORKS"

David N. Barron and Lynn Smith-Lovin

This paper uses the definition of negatively connected exchange relations proposed by Yamagishi et. al (1988). In the case of the B1--A--B2 networks we study, this means that the probability, p, of an A--Bi exchange, given that an A--Bj exchange has already occurred, is less than the prior probability of an A--Bi exchange. We hypothesize that increasing the conditional probability, p, will decrease the power of A, by reducing the dependence of the peripheral positions. We report the results of computer simulations which demonstrate that the distribution of resources in non-exclusive, negatively connected networks is sensitive to the negotiating strategies adopted by the participants in a variety of interesting ways, even when all actors adopt rational strategies. Aspects of strategy that are varied include resistance of actors to accepting low offers, the rate of increase of rejected offers, the refusal to accept offers below a given threshold, and the effect of acceptance or rejection on future offers. We also find that the normally accepted measure of power use (profit per exchange) is not always closely correlated with total profit. This suggests that the relationship between the strategies of participants in exchange and the ensuing resource distribution is more subtle than has hitherto been acknowledged.

"ORGANIZATIONAL STRUCTURES AND NETWORK PROCESSES II: AN EXPLORATION OF EXCHANGE PROCESSES"

Norman P. Hummon

This paper explores how organizational structures evolve out of the exchange processes associated with the flow of work. A simulation model represents the organization as a collection of individuals with attributes, and a set of decision rules. These rules govern how work tasks are assigned and whether the assignments are accepted. The flow of work tasks is modeled as an organizational network. The structure of this network reveals the organizational structures that result from exchange processes. The simulated organization members have two types of skills: Making task referrals, and completing tasks. Rewards and costs are associated with referring and completing tasks and these rewards and costs govern the decisions of the simulated organization members. The model assumes that organization members are perfectly rational, always making choices which maximize their own positions. The results show that hierarchy and division of labor evolve from a rational exchange process in the referral and completion of work tasks.

Session N: Organizations
Chair: **Joel Levine**, Department of Sociology, Dartmouth College

"ARE HIERARCHIES 'NATURAL' IN HUMAN SOCIAL ORGANIZATIONS? OR WHY DO WE ACT LIKE MONKEYS?"
Karl P. Reitz
Linear dominance hierarchies characterize much of primate social organization. These hierarchies are often based on genealogical kinship and not necessarily on human notions of dominance such as strength, age, and intelligence. It is often assumed that human social organizations which reflect the same hierarchical form are therefore "natural." The present paper presents the case that the form of social organization may instead reflect to a certain degree the ease with which it can be learned. It will attempt to answer such questions as: "What principles can be used to ease the learning of a social organization?", and "Why do the organizations within complex societies more closely resemble primate social organization than do early human societies?"

"STRUCTURE AND STRATEGY: POLITICAL NETWORKS AND LEADERSHIP SUCCESS IN A COOPERATIVE AGRIBUSINESS SYSTEM"
Martin Gargiulo
Network analysis can be used to explain how actors engage in strategic action oriented to improve their structural opportunities for success. Using a network model of strategic action and drawing on the resource-dependence approach to complex organizations, I analyze the dynamics of the dominant coalition in a major cooperative agribusiness system in Uruguay (South America). I argue that changes in the dominant coalition and leadership success are a function of the strategic action of leaders in the organization's life. Actors who take advantage of structural opportunities may have an effect on the distribution of power within the system, thus affecting future organizational policies.

"TRANSACTIONS PATTERNS BETWEEN ISRAELI ECONOMIC MARKETS: 1972-1982"
Ilan Talmud
It is widely accepted that the maintenance and affluence of organizations is shaped by their modes of resource dependence. A key element of resource dependence is the question of predictability and flexibility of external resources. The present paper analyzes technological exchange patterns among resource-dependent units. The study sheds some light onto the exchange patterns among economic industries, each producing a relatively homogeneous set of products and dependent upon other sectors as both sellers and buyers. The present study has two purposes: (1) to inquire into the stability of the Israeli market boundaries between 1972-1982; (2) to assess the linkage between structural position in the Israeli economy and economic performance and profitability of markets. The structural equivalence principle describes similarities among transactions' relational patterns. Multidimensional scaling of the distances matrix among economic sectors provides a visual image of market boundaries, determined by arenas of technological inter- dependencies. It means a relatively stable and certain environment for organizational activity. Dyadic distances among markets are correlated over years, showing a dramatic stability of relational patterns over time. Indicators of economic performance and gains of Israeli sectors are regressed on their network properties. The results show that economic performance and profitability indicators can be predicted by network positions, their source and dispersion of transactions.

"THE EFFECTS OF NETWORKING ON MANAGERIAL CAREER OUTCOMES"
Julia M. Bristor, Mitchell G. Rothstein, and Ronald J. Burke
Despite inroads made by women into managerial level jobs, current statistics still suggest that the relative numbers of women in management positions, and their upward progression, lag behind their male counterparts. The development of relationships, such as mentoring and peer support, has been identified as a key career success factor. Such relationships can provide a person with career and/or social support, as well as access to the "old boys" network. Previous research results have suggested that managerial women have been relatively less successful because they lack supportive relationships and thus, access to the network. Our research studies the personal support networks of 150-200 managers in 4-5 large organizations. Personal support networks can be defined as the set of people who provide some form of personal and/or professional support to the focal person, and can be described along dimensions such as the number of members and their identities, the professional and psychosocial functions provided by the relationships, and the network's gender composition. We hypothesize that: (1) personal support networks vary by gender; and (2) support networks that contain more members, provide more functions, contain more men and powerful members of the organization, more outside members, etc. are associated with greater career success (e.g., satisfaction, promotions, organizational commitment).

Session O: Network Size
Chair: **Douglas White**, School of Social Sciences, University of California, Irvine

"ESTIMATING THE SIZE OF PERSONAL NETWORKS"
Peter D. Killworth, Eugene C. Johnsen, H. Russell Bernard, Gene Ann Shelley, and Christopher McCarty
Some methods for estimating the total size of personal communication networks are presented. All involve the scaling up of a reported network by a factor proportional to the number of people whom informants can recall when they are presented with a representative list of names from a telephone directory. Estimates from Jacksonville, Florida give network sizes of 1,700, plus or minus 400; reevaluations of an estimate made for Orange County, California give 2,025; and estimates from Mexico City give network sizes of about 600. The difficulties, and sources of error, in these estimates, are discussed. The estimates are compared with independent estimates based on the likelihood of informants knowing members of a small, countable subpopulation, which suggests for U.S. informants a network size of 1,526. Thus consistent numbers are beginning to emerge, at least for U.S. informants.

"COMPARING FOUR DIFFERENT METHODS FOR MEASURING PERSONAL SOCIAL NETWORKS"

H. Russell Bernard, Peter D. Killworth, Eugene C. Johnsen, Gene A. Shelley, Christopher McCarty, and Scott Robinson

Researchers often use network generators as memory-jogging devices to get informants to name their social network members. The number of people listed varies according to the type of questions asked. In this paper, we compare four different network generators administered to the same informants: the questions used by Burt in the 1985 General Social Survey to get at respondents' intimate networks; the questions used by Fischer and McCallister to get at the social support network in the Northern California Study; the reverse small world instrument (RSW), designed by Bernard and Killworth to elicit informants' instrumental network; and the phone book technique, originally conceived by Poole and Kochen and developed by Freeman and Thompson to estimate the total size of informants' networks. Informants come from Jacksonville, Florida and from Mexico City. For each group of informants, we examined the size of their networks and the percentage of membership overlap dredged up by each network generator. Overall, Mexico City informants reported fewer network members than did Jacksonville informants. In both cultures, women appear more frequently in the intimate and social support networks, while men appear more frequently in instrumental and global networks. Mexico City residents listed more family in their intimate and social networks than did Jacksonville informants. There were also significant differences between the two societies in how and when spouses were elicited by each network generator. The overlap between the social support network and the instrumental network is greater for Mexico City informants than for Jacksonville informants. Two major differences between how people categorize friends, relatives and acquaintances were also discovered.

"ESTIMATION OF ACQUAINTANCESHIP VOLUME: ANOTHER LOOK AT THE PHONE-BOOK METHOD"

Timothy J. Brazill

Poole and Kochen developed the "phone-book method" in the 1950s to estimate acquaintanceship volume. Freeman and Thompson significantly improved the technique, and recently, Bernard and others replicated the work of Freeman and Thompson. Questions raised by these recent studies include the following: Are the volume estimates determined to some extent by the particular phone-book used and/or by the area from which the informants are drawn? Does the actual manner of selecting the sample names have an effect on the volume estimates? This paper provides some answers to these questions as well as new evidence on acquaintanceship volume.

"OCCUPATIONAL EXPERIENCE AND THE STRUCTURE OF PERSONAL NETWORKS"

Jung-Kyu Lee and Frank P. Romo

In this paper, we investigate the structure of personal networks in terms of size, composition of strong versus weak ties, and multiplexity. Researchers have attributed much to a weak-tie strategy, especially in obtaining information about job and housing opportunities as well as finding professional services. There is, however, no research on why actors choose either weak- or strong-tie strategies, or why the members' personal networks have either segregated or overlapping social roles. Researchers have either implicitly or explicitly assumed that the choice of a personal network strategy is a matter of individual preference, subject to attitudinal factors which are conditioned by forces external to the choice-making situation. In our research, we seek to rectify this deficiency. Employing the "contingency" perspective in organization theory, we develop and test a model which relates the structure of personal networks to occupational experience, especially the typical constitution of tasks in various kinds of jobs. We use a polytomous logit model in which characteristics, education, tenure in the labor force, and gender are explanatory variables. We test this model on network data from the NORC General Social Survey (1985).

"GETTING FAMILY NETWORKS BY SURVEYS"

Walter Bien, Jan Marbach, and Franz Neyer

Can family-related questions adequately be answered with household-related data? This question guided our study of family configurations in the Federal Republic of Germany. We used survey techniques to identify ego-centered networks (10-12 network generators, 406 network interpreters). After two pretests (n1 = 95, n2 = 534), our main survey (n = 10,000) was conducted. We interviewed a subsample of 100 people twice to measure the reliability of our instrument. Our results show: (1) it is possible to obtain network data by using survey techniques (2) the size of networks, named persons, and named relations are reasonably stable over time and (3) the network generator instrument is constant against minor changes in the formulation of the questionnaire and against minor variations in the data- collecting techniques.

Session P: Class and Culture

Chair: **Alvin Wolfe**, Department of Anthropology, University of South Florida

"STATUS DIFFERENCES IN PERSONAL NEIGHBOR NETWORKS"

Karen E. Campbell and Barrett A. Lee

Using data from interviews with adults in 80 Nashville neighborhoods, we evaluate three explanations of status variation in personal neighbor networks. If social integration shapes neighbor networks, we would expect women, married persons, parents, and high SES persons to know more neighbors. If need for local contacts is paramount, then singles, those without children, and low SES persons should have the largest networks. Finally, if network size is dependent on the time available for forging relations with neighbors, men, singles, and those without children will have more neighborhood ties. In addition to the size of personal neighbor networks, we analyze the frequency of contact and intensity that characterize ties within the neighborhood, as well as multiplexity and the spatial dispersion of relations with neighbors. Women, married persons, and high SES persons knew more of their neighbors by name, but married persons, those with children, and high SES respondents had either less frequent contact with, or ties of shorter duration to, neighbors. A blending of the social integration and need perspectives is used to account for this pattern: persons in statuses characterized by high social integration by virtue of those statuses, while those in more marginal statuses largely compensate by building smaller networks distinguished by long- standing friendships that are reinforced by frequent contact.

"INVOLVEMENT IN RITUAL AND THE EMERGENCE OF SOCIAL STRUCTURE IN A JAVANESE COMMUNITY: A NETWORK APPROACH"

Thomas Schweizer and Elmar Klemm

So far anthropology has been examining ritual as systems of meaning or dramatic performance. The organizational dimension of ritual events -- which has been covered by case and situational analysis in the Manchester School tradition a long time ago -- has been neglected. The present paper is a report from on-going social network research. Applying contemporary network procedures, this project tries to reintroduce the organizational dimension into the analysis of ritual. In this perspective, repeated participation in rituals creates order among actors, fusing them into subsets by way of joint involvement in the same events. The data, collected during ethnographic fieldwork in a Javanese village, consist of joint involvement data on the participation of households (1/3 of the village) in all religious feasts occurring during a two-month period. Participation in these rituals is the key to cooperation among households, establishing a sense of community in otherwise weakly structured Javanese society. Hence network analysis of joint involvement data on ritual will be useful to detect the main positions in the village social structure and to trace the influence of class and religious factions on the patterning of ritual exchange.

"PARTITIONING THE INFLUENCE OF SOCIAL NETWORKS AND SUPPORT ON MENTAL HEALTH"

Tonya L. Schuster

Recent investigations of general populations indicated that egocentered network size (defined as those who are close and/or important) may be a more parsimonious predictor of various mental health outcomes than characteristics of the social support network. The current study moves beyond this according to a variety of compositional characteristics, such as relative closeness to the respondent, kin versus non-kin relations, frequency of contact, geographical proximity, etc. Hierarchical regression analyses compare the relative contributions of various network components, controlling for the influence of sociodemographic characteristics and formal social participation/integration for a longitudinal community sample of middle-aged and elderly individuals. Results have implications for theory and future research on the influence of egocentered social networks structure and processes on the mental health and well-being of general populations.

"ORGANIZATIONAL NETWORKS AND THE CRITICAL MASS"

August E. Grant

Traditional research on the diffusion of innovations concentrated primarily upon factors influencing adoption of an innovation by individuals. The present paper seeks to extend these ideas by examining organization-level factors that precede individual adoption. For any innovation, a "critical mass" of organizational function is necessary before individual adoption can take place. The complexity of the innovation is positively related to the number of organizational functions necessary. The key factor in achieving "critical mass" is the pattern of relationships among companies serving these organizational functions. The optimum condition for critical mass, and therefore for adoption, is complete vertical integration in which a single form provides each of the organizational functions. Network analysis is suggested as the appropriate tool to examine organizational adoption.

Session Q: Illness and Social Support

Chair: **Marguerite A. Koster**, Department of Sociology, University of Southern California

"SELF-HELP, SOCIAL NETWORKS AND SOCIAL ADAPTATION IN LUPUS"

Carl A. Maida, Alfred H. Katz, Gayle Strauss, and Cecelia Kwa

This paper reports a pilot study of socio-psychological problems and adaptions of 41 patients suffering from systemic lupus erythematosis. The overall goals of the study were to investigate the "natural history" of SLE, from the perspective of the effects of its biomedical processes upon socio-psychological problems and coping strategies to meet them; to study the effects of peer, self-help support groups on patients' perceptions of, and coping behavior around, problems related to the illness; and to compare a group of 21 patients using lay or self-care resources with 20 controls from a teaching hospital rheumatology clinic, and a population of 16 chronic renal patients who use the CAPD self-dialysis technique. The psychological status instruments used were the Profile of Mood States (POMS), the Multidimensional Health Locus of Control Scales, and the Antonovsky Sense of Coherence Questionnaire. The social status instruments were the Myers Social Resources and Social Supports Measure and the Social Adaptation and Psychological Coping Questionnaire designed for this study. Summarizing the data obtained through the psychosocial battery and detailed interviews with subjects in both the experimental and control groups, we may construct a profile of SLE patients in our sample. Their mean age at the time of study was 37 years. Their illness had taken a long time to diagnose definitively: a mean of 4.3 years since medical care was first sought. While a sizable percentage had never been married, the majority had been. However, 20% of those in marriages and in stable partnerships were divorced or separated after the onset of their illness. There were only slight differences between lupus patients in our sample and the norms for healthy adults on the 3 psychological status measures. There were, however, statistically significant differences, between experimental and control groups, in the structural characteristics of their social networks, as indicated by the mean number of available supports and, consequently, the dimensionality and density of the networks. This may be the result of the experimental group members' participation in the regularly meeting self-help sessions which served as a medium for instrumental and affective support. A specially-designed instrument recorded data about self-help sessions of 2 groups meeting regularly for 8 months. While not statistically significant, observable differences between the groups were found in the contents, intensity of the discussions, the extent of participation in them, and general mood at the session conclusion. These differences are explained in terms of the groups' composition.

"SOCIAL NETWORK CHARACTERISTICS AND PERSONALITY AS MEDIATORS OF THE STRESS-ILLNESS RELATIONSHIP"

Helen Dermatis and Martha Ann Carey

Although considerable attention has been given to identifying dimensions of personality and social support which may protect individuals from becoming ill under stress, the role of social network characteristics, in addition to social support, including social composition, perceived support reciprocity, and network stress (i.e., stressors experienced by members of the individual's primary social network) have largely been overlooked. The purpose of this study was to examine how personality factors and primary social network characteristics mediate the relationship between stress and illness. Three- hundred eighty-eight community health nurses, at varying levels of occupational stress, were assessed with respect to their level of hardiness, a personality style consisting of three attributes (challenge, commitment, and control) and primary social network characteristics including network size, social composition, network stress, perceived satisfaction with social support, and perceived support reciprocity. Results are presented concerning the properties of social networks which may impair as well as enhance one's capacity for illness resistance under stress.

"SOCIAL NETWORKS AT WORK IN SOVIET GEORGIA: THE ROLE OF PERSONAL SOCIAL SUPPORT NETWORKS IN CENTRALIZED COMMAND ECONOMIES"

Yachanan Altman

A five year research into the workings of informal economic sectors (the "black" economy) in Soviet Georgia, possibly the most notorious of all Soviet republics in this regard, highlights the crucial role of personal social networks in the workings of the informal economy. The paper presents the following: a schematic analysis of the composition, build-up and maintenance of one's personal social support network (PSSN); examples of the utilization of PSSN in the workplace dealing with recruitment and promotion, a classification of organizations by PSSN criteria, and relationship with authorities; the relationship between formal and informal economies and the place of PSSN in both; and case studies of the workings of PSSN in times of crises. Finally, an assessment of the impact of current policies (perestroika) on PSSN, will be made.

"THE EFFECTS OF SOCIAL NETWORKS AND FAMILY TIES ON THE TREATMENT OF INFANTILE DIARRHEA"

Gery Ryan

This paper examines the relationship between who rural Mexican women know and how they manage infantile diarrhea. Several questions are involved: How are beliefs about diarrhea and its treatments correlated with who people know? Who are the cultural "experts" in this domain and how are they related to one another socially? How do medical beliefs correlate with reported treatment behavior? Do "experts" differ significantly from "non-experts" in behavior patterns, and if so, why? Answers to these questions have important implications for medical intervention programs.

"SOCIOMETRIC CHOICE AND PSYCHOLOGICAL WELL-BEING AMONG ANTARCTIC WINTER-OVER PERSONNEL"

Jeff Johnson and Lawrence Palinkas

Much of the earlier work on small group dynamics and social networks acknowledged the importance of sociometric preferences in achieving group harmony. Although such preferences generally led to the production of more harmonious and effective groups, there was a lack of any coherent theory to explain such outcomes. This paper examines the relationship between a variety of psychological variables (e.g., depression, cognitive disorientation, irritability, and anxiety) and the network preferences of actors for other winter-over personnel at U.S. Antarctic research stations. A number of hypotheses concerning these relationships are tested.

Session R: Measurement Issues

Chair: **John P. Boyd**, School of Social Sciences, University of California, Irvine

"THE EFFECTS OF URBANISM ON BLACK SOCIAL NETWORKS"

Zhong Deng and Phillip Bonacich

Claude Fischer (1982) argued that urbanism increases the strength of urban subcultures and networks, including the networks and cultures of urban ethnic minorities. However, Fischer intentionally excluded predominantly black communities from his study. Using the 1985 General Social Survey, which asked questions about social networks, and the 1982 General Survey, which over-sampled blacks, it appears that black networks and subculture are not strengthened by urbanism. There is even some evidence that they are weakened.

"WHEN IS A CONTACT NOT A CONTACT? REPORTED AND OBSERVED INTERACTIONS IN AN ELECTRONIC NETWORK"

J. D. Eveland and T. K. Bikson

The lack of coherence between self-reports of communication interactions and external observer assessments of the same interactions has provoked considerable aggravation in the research community. Some have argued that self-report data are "unreliable" and should be discarded in favor of hard observation; others have suggested that the two varieties of data simply represent independent realities. The present paper reports our efforts to reconcile observed and reported contacts in an electronic mail network over a one-year period. Forty individuals -- half currently employed, half recently retired from the same firm -- participated in a task force project to construct a report. In addition to the usual communication technologies -- meetings, phone, letters -- the participants each had a computer and electronic mail links to the others. Electronic mail interactions were logged over the project year; in addition, at four points during the year participants were queried about their interactions with each other. The question is why individuals fail to report contacts with individuals with whom they have in fact exchanged electronic messages. We identify factors that affect the likelihood of convergence between observed and reported contact, and suggest some implications for the assessment of interactions in electronic communication networks.

"TIE STRENGTH: A NEW WRINKLE ON AN OLD FRIEND"

Harold F. Koenig

Research in channels of distribution has been focused on "business-like" aspects of the channel relation for many years. This includes measures of organizational dependence, power, uncertainty, and conflict. Recently, it has been recognized that some of the transactions in the channel should be handled as relationships rather than as discrete exchanges. This perspective focuses attention on variables more frequently associated with other disciplines. The elements of tie strength proposed by Granovetter are congruent with this focus. Channel researchers have measured variables similar to these elements, but they have not "put the pieces together" or combined the elements into one construct. This study extends previous research in channels and attempts to move beyond the single item measures of tie strength employed in most interpersonal research. The theoretical foundation for the interorganizational tie strength construct is dimensions of interorganizational relations which parallel Granovetter's work in the interpersonal area. This paper reports the results of an empirical study which operationalized tie strength as a multiple item construct. This effort was successful; the construct's reliability was acceptable, and preliminary evidence of construct validity was found.

"SOCIOCOGNITIVE NETWORK ANALYSIS OF GROUP DECISION-MAKING AMONG CONSUMERS"

James Ward and Peter Reingan

A sociocognitive network perspective is developed to further the understanding of the relationship between cognitive and social processes. The approach combines social network analysis with a cognitive network perspective to enable the researcher to study how social structure influences cognitive structure and how shared cognitive structure influences choice. This perspective is applied to a neglected subject of inquiry in consumer behavior: Namely, how a group (with several subgroups) makes a consumer decision with consequences for the entire group. The results show that social structure influences cognitive structure, that shared knowledge is related to choice, and that the sociocognitive perspective provides new and significant insights prior to literature on group decision making and the relationship between group memberships and brand choice.

"RANKINGS FROM ROUND ROBIN TOURNAMENTS"

John P. Boyd

The problem of numerically ranking people based on a sample of outcomes from pairwise contests is a classic problem in social science. One of the most highly developed such systems in actual use is the chess rating system developed by Elo (1961). The chess rating system suggested by Barchelder and Bershad (1979) is based on a linear approximation that eliminates consideration of how good were the players that were played, judged by how well they did in the tournament itself. Clearly, some type of recursive calculation similar to the determination of eigenvectors is called for (Bonacich). An obvious approach is to use modern numerical methods on the full Thurstone model. When this was tried, however, there was no convergence in the case of a perfect linear hierarchy. The model can be saved by adding a term corresponding to the a priori probability of the rankings. The method used is conjugate gradients, as described by Polak- Ribiere (1971).

The following abstract from the 1989 Sunbelt Conference was inadvertently omitted when Connections *published those abstracts.*

"Enterprises, Groups, and Complexes: Extending the Topology of Corporate Strucure (M)

Steve Berkowitz

Previous research has shown that "enterprises" -- groups of firms operating under common control -- perform a number of important functions, which are different from those we associate with "establishments" and "firms," in industrial "market areas." This paper seeks to explain and extend this typology. A model is developed which elucidates the roles played by each of these units in defining and maintaining industrial market structure in advanced capitalist economies. Formal definitions of two additional units -- "groups" and "complexes" are then presented and hypotheses are specified about how these units of analysis can be used to modify our understanding of market and non-market -- or organizational -- stucture in an industrial economy. This paper contends that these units can be used to represent and imbed dimensions of corporate structure which are qualitatively different from those which have been historically associated with "establishments," "firms," and "enterprises," and thus extends the topology we use in interpreting corporate structure. Examples drawn on an earlier study of the Canadian economy are used to illustrate these hypotheses.

ABSTRACTS:

BOOKS

Amit, Daniel. (1989). *Modeling Brain Function: The World of Attractor Neural Networks.* **New York: Cambridge University Press. (504 pp.).**

This book summarizes the ideas, techniques, and results developed in the last 5-6 years in the physics community about the collective properties of large assemblies of neurons. These studies have produced a wealth of new concepts and new detailed results which have not gone unnoticed outside physics departments: Biologists have begun to ask themselves whether the properties that physics anticipates in neural networks can indeed be observed and whether they provide useful theoretical guides for the empirical investigation of brain activity; computer scientists consider these ideas as candidates for coherent parallel processing; psychologists and neurologists expect this research to suggest some new useful metaphors for interpreting behavioral dysfunction; and cognitive scientists study the new concepts in their continued struggle with the elusiveness of processes of mind.

Barrett, Edward (ed.). (1989). *The Society of Text: Hypertext, Hypermedia, and the Social Construction of Information.* **Cambridge, MA: MIT Press. (480 pp., $37.50).**

This collection of essays continues Barrett's investigations into implementing networked online systems described in his first book, *Text, ConText, and HyperText*, with a more focused emphasis on specific hypermedia systems. In four parts, the 23 essays take up the design of hypertext and hypermedia systems for the online user; textual intervention and collaboration; new roles for writers; and sense making and learning in the online environment.

Berry, Sara S. (1985). *Fathers Work for Their Sons: Accumulation, Mobility, and Class Formation in an Extended Yoruba Community.* **University of California Press. (225 pp.).**

In this study of Yoruba cocoa farmers and their descendants in Western Nigeria, Berry examines the consequences of agricultural commercialization for economic development, political mobilization, and social change. She describes the ways in which farmers have used their income from export crop production, and examines the implications of farmers' expenditure patterns for the changing structure of economic activity. She also traces income transfers and changing social relationships among migrant farmers, their home communities, and their immigrant sons and daughters, in order to show how social relations have shaped and been influenced by uses of income and productive resources in a highly mobile society. By utilizing case histories of individuals, descent groups, and communities, Berry elucidates aggregate processes of economic, social, and political change in Western Nigeria.

Boswell, Terry, & Bergensen, Albert (eds.). (1989). *America's Changing Role in the World-System.* **Praeger. (300 pp., $37.95).**

The basic premise of this volume is that major social, political, and economic dynamics in the contemporary United States are ineluctably intermeshed with our country's relative decline in the international system. The editors take U.S. hegemonic decline in the past twenty years as a given; their goal in this collection is to understand "the effects this situation has had on the U.S. and world economies." Their introductory chapter summarizes the theoretical issues and attempts to knit all of the thirteen chapters that follow into a coherent whole. The first section of the book provides four synthetic assessments of "continuity and change" in the global system of the late twentieth century. Part two focuses on the U.S. in the international system. The final section of the volume consists of four essays examining the effects of hegemonic decline on American art, culture, and gender relations.

Clegg, Steward R. (1989). *Frameworks of Power.* **Newbury Park, CA: Sage. (272 pp., $49.95).**

This overview opens with classic literature on power as expressed by Machiavelli and Hobbes. Clegg then addresses more recent analyses. Included are the works of American political and social theorists, British sociologists, the German critical theorist, Jurgen Habermas, and the increasingly important contributions of the French school, Michel Foucault, Bruno Latour, and Michel Callon.

Coontz, Stephanie. (1988). *Social Origins of Private Life: A History of American Families, 1600-1900.* **New York: Verso. (365 pp., $50.00 cloth; $13.95 paper).**

This history of American families from pre-Revolutionary times through the advent of the 20th century weaves family history into a larger tapestry of economic, political, social, and cultural developments. Virtually all aspects of family life are covered in considerable depth: native American families prior to European colonization, slave and plantation families in the antebellum South, immigrant families, working-, middle-, and upper-class families throughout our history, changing gender roles and definitions, notions of childhood household division of labor, and so on. The viewpoint on family history taken here is largely Marxian in that the evolution of family forms is seen as derivative of larger economic and market forces; the function of the family in this analysis is to reproduce the social class structure. Coontz argues that there has never been a "Golden Age" of American family life and never will be. The history of families is one of gains in some areas offset by losses in others, always in the adaptation of the family to the demands of an industrializing capitalist economy.

Crowfoot, John, & Glebov, Oleg (eds.). (1989) *The Soviet Empire: Its Nations Speak Out.* **New York: Harwood Academic Publishers. ($45.00 cloth; $22.00 paper).**

This is the first in a topical series of books on current, informed opinion and discussion of events in the Soviet Union. Volume 1 consists of excerpts from speeches at the recent historic Congress of People's Deputies (May 26-June 10 1989). The theme which emerged most clearly and insistently from the Congress discussions was not the 'state of crisis' in the Soviet economy or in society, with its dissatisfactions and rising crime rate, but the long neglected problems of half the population who are not ethnic Russians, and the issue of national self-identity of the Russians themselves.

Danet, Brenda. (1989). *Pulling Strings: Biculturalism in Israeli Bureaucracy.* **Albany: NY: State University of New York Press. (374 pp., $18.95).**

This book examines devices for the processing of citizens' complaints about unfair treatment in organizational encounters. These devices include ombudsmen, small claims courts, newspaper Action Line columns, Better Business Bureaus, and media programs which investigate complaints. Arising initially in the West, these devices have spread rapidly around the world, both in industrialized countries and in those on the road to industrialization. Their appearance is a response to the call for greater accountability of public institutions, and for at least partial redress of the tremendous imbalance of power between individual citizens and these huge institutions. In this study, Danet examines Israeli's knowledge and attitudes toward two strategies of demanding redress: universalistic channels which are open to everyone and particularistic channels in which personal connections are used to get something one wants ("pulling strings"). This study is cast primarily at the social- psychological level: Danet surveyed Israeli citizens on their knowledge and attitudes toward universalistic and particularistic channels of redress and asked what channels were utilized when redress was sought and what the outcomes of these actions were.

DiMaggio, Paul J. (ed.). (1986). *Non-Profit Enterprise in the Arts: Studies in Mission and Constraint.* **Oxford: Oxford University Press. (370 pp., $39.95).**

This book is an attempt to illuminate the reasons for the proliferation of the non-profit organization as the dominant form of arts organization, to discern the comparable advantages and disadvantages of this form over the proprietary model, and to examine the effects of various types of funding on the missions of non-profit organizations. The organizational structure (the internal structure of culture-producing organizations) and industry structure (the number and size of firms in a culture- producing industry) are the primary focus of this volume. DiMaggio has gathered an array of interdisciplinary work representing the contributions of seven sociologists, three economists, two lawyers, and two students of management.

Duck, Steven, & Gilmour, Robin (eds.). *The Emerging Field of Personal Relationships.* **Broadway, NJ: Lawrence Earlbaum Associates.**

This volume presents the results of the first International Conference on Personal Relationships. The conference sought to lay the groundwork that would define the area of personal relationships as a new field. The editors did not merely produce actual transcripts of the conference, but instead furnished select highlights of significant issues in personal relationships research.

Erie, Stephen P. (1988). *Rainbow's End: Irish-Americans and the Dilemmas of Urban Machine Politics, 1840-1985.* **Berkeley and Los Angeles: University of California Press. (345 pp., $27.50).**

This book on machine politics in eight heavily Irish cities (Albany, Boston, Chicago, Jersey City, New York, Philadelphia, Pittsburgh, and San Francisco) rejects portrayals of the Democratic machines as distributive institutions or as positive models for contemporary minority politics; Erie argues that machine politics did not facilitate economic mobility for the Irish and did not incorporate other ethnic groups. Erie, a political scientist, offers an original version of exchange theory as a substitute for sociological interpretations of the machine. He defines the political economy of the machine by resource scarcity. Material incentives, such as patronage jobs and municipal services, are most effective in inducing citizens to support the machine as voters or activists. In his comparative study of individual cities, Erie explains intercity differences by examining relations between would-be machine leaders and state and national officials. Simply by pointing out that Boston, the most Irish of America's big cities, never had a central machine, Erie demonstrates that machine politics did not grow automatically from Irish ways.

Fararo, Thomas J. (1989). *The Meaning of General Theoretical Sociology: Tradition and Formalization.* **Cambridge: Cambridge University Press.**

The main objectives of this book are to set out a conception of general theoretical sociology and to show how its key problems can be defined and studied in formal terms. Four topics are treated in detail: (1) a philosophy of general theoretical sociology; (2) a dynamic systems formulation of its key problems, all of which pertain to social structure; (3) formal studies in action theory and social order; and (4) integrative theory construction centered on the analysis of social structures in network terms.

Fennel, Mary L., & Warnecke, Richard B. (1988). *The Diffusion of Medical Innovations: An Applied Network Analysis.* **New York: Plenum Press. (285 pp., $34.50).**

In this monograph, the authors present research findings on the efforts of the National Cancer Institute (NCI) to disseminate state-of-the-art cancer-treatment strategies to hospitals and community practitioners in seven regions of the United States. Several research questions are addressed, but mostly the authors attempt to show how and why strategies were more or less successfully disseminated. Although there is reference to organizational theory and some effort to test hypotheses, the book is highly descriptive, with a strong applied emphasis. This book shows that models of innovation diffusion that focus on individual decision making are inadequate for understanding the diffusion of many innovations. Often there is a change agent, which has a mandate to disseminate an innovation and does this through interorganizational channels. In this case the outside actor is the NCI, the innovation is a multidisciplinary treatment strategy for treating head and neck cancers, and the interorganizational channels are the linkages between regional medical research centers and community hospitals. Under these circumstances, models based on individual adaptation are inappropriate since there are dynamics working independently at the national, regional, hospital, and network levels. Findings suggest that community-hospital participation in networks may depend upon a combination of resources, interest, and network structure.

Green, Paul, Carmone, Frank, & Smith, Scott. (1989). *Multidimensional Scaling: Concepts and Applications.* **Boston: Allyn and Bacon. (407 pp.).**

This book on multidimensional scaling is intended for the non- technically oriented student and practitioner. The presentation of analytic techniques emphasizes conceptual clarity over technical detail. This book includes a set of readings from multidimensional scaling literature to offer the beginning student and practitioner an appreciation for the work that has been done in this area. To provide readers with an opportunity to become familiar with the computer software available for carrying out this methodology, descriptions of seven computer programs are included.

Grossberg, Stephen. (1988). *Neural Networks and Natural Intelligence.* **Cambridge, MA: MIT Press. (544 pp., $42.50).**

An anthology of some of the latest research in neural networks. Presenting real-time computer simulations and rigorous demonstrations of these phenomena, this book includes results on neural network architecture for pre-attentive 3-D vision, mathematical and computer analyses of self-organizing multiple- scale cognitive recognition codes, explanations for data about decision-making under risk based on cognitive-emotional interactions, and adaptive robotics.

Hechter, Michael. (1987). *Principles of Group Solidarity.* **Berkeley: University of California Press. (219 pp., $28.50 cloth; $10.95 paper).**

In this book, Hechter notes that the influence of a group on its members' behavior depends on how solidary the group is. Hechter takes up the question of how group solidarity is produced and, after reviewing normativist and structuralist explanations, tries to answer it using rational choice principles. His answer is that solidarity is produced by the combination of two factors: the dependence of members on a group (which makes it costly for them to leave the group) and the control of members' behavior through monitoring and sanctioning (which prevents them from exploiting the group by free riding). Hechter uses intentional communities to illustrate that controls continue to be needed in even the most solidary groups and that certain institutional arrangements common in intentional groups can make control cheaper. Those intentional communities that have extensive controls are more likely to survive than those that lack controls.

Heise, David R., & Smith-Lovin, Lynn (eds.). (1988). *Analyzing Social Interaction: Advances in Affect Control Theory.* **New York: Gordon & Breach. (192 pp., $32.00).**
Affect control theory asserts that people interpret their social experiences in such a way as to confirm sentiments they already hold about the people with whom they are interacting. This work describes a variety of tests, using both experimental and survey data, that demonstrate the accuracy of the theory's prediction of behavior. The authors expand the theory to cover such topics as emotions, attributional processes, establishment of identity, and the impact of locations of social interaction. They also show how the theory can be explored through a powerful computer simulation that predicts behavior based on brief descriptions of the actors within the social setting.

Jackall, Robert. (1988). *Moral Mazes: The World of Corporate Managers.* **New York: Oxford University Press. (249 pp., $21.95 cloth; $7.95 paper).**
Jackall's account is based on hundreds of interviews with corporate managers in three companies, including a major conglomerate (within which he focuses largely on its chemicals division, a large Southern textile company, and a prominent public relations firm. He found that managerial careers are made or broken in a web of relationships which are intensely personal, in which the criteria of evaluation are ambiguous, and in which the vicissitudes of outside events and the whims of top management pose challenges and opportunities as unpredictable and unavoidable as the weather. A sense of being constantly on probation is endlessly recurrent. The picture Jackall paints is one of men (primarily) who feel constantly vulnerable and anxious, acutely aware of the likelihood at any time of an organizational upheaval which could overturn their plans and possibly damage their careers fatally.

Kimmel, Michael S. (1988). *Absolutism and Its Discontents: State and Society in Seventeenth Century France and England.* **New Brunswick, NJ: Transaction Books. (265 pp., $34.95).**
This book provides a view of the English revolution of 1640-60 and the 1648-53 *frondes* against the French monarchy as similar reactions to efforts by states to appropriate the organizational and fiscal resources to subdue domestic rivals and to wage foreign war. Michael Kimmel draws upon state-centered models of Skopol, Tilly, and others to contend that monarchs and their allies were the principal agents of social structural changes in England and France in the early modern period. He argues that state policies magnified initially "small differences in aggregate output or level of commercialization" and thereby produced different antiroyalist coalitions with varying agenda and prospects for success.

Kiser, John W., III. (1989). *Communist Entrepreneurs.* **United States: Mafia Press. (225 pp.).**
Long before Mikhail Gorbachev came along, individuals in Eastern Europe and the USSR were creating mini-perestroikas before their time, testing the flexibility and patience of their systems. They were creating models from which Gorbachev's reform process could learn and expand. The tenacity of these successful entrepreneurs shows that such strains exist even in the most hostile environments. The individuals profiled in technology-broker Kiser's study have carved out niches in their home economies, and like their Western maverick counterparts, have succeeded by being unquestioned performers in their chosen fields.

Knox, Paul, & Agnew, John. (1989). *The Geography of the World-Economy.* **New York: Edward Arnold. (410 pp., $21.95).**
The objective of this introductory text on economic geography is to provide a broad synthesis of modern work and thinking from which more specialized studies may be developed. The emphasis throughout is on the presentation and explanation of contemporary patterns of economic differentiation. Recurring themes include center-periphery relationships and the interdependence of economic development at all spatial scales -- international, national, regional and local -- and in both market-oriented and centrally-planned economies. The book moves away from the linear models and monolithic perceptions of economic change which dominate most of the current introductory literature. At the same time, it achieves a balance between the analysis of regularity and the description of diversity in the economic landscape. This, in turn, involves the recognition and explanation of historical processes and inter-regional linkages which extend beyond the individual resource bases, factors of production and industries, around which most textbooks are based.

Kochen, Manfred (ed). (1989). *The Small World.* **Norwood, NJ: Ablex Publishing Corporation. (382 pp.).**
The phenomenon of two strangers meeting in a strange place and discovering that they have a common

acquaintance occurs surprisingly often. It is related to the equally counterintuitive fact that a chain of at most seven intermediaries, and more commonly two or three intermediaries -- friends of friends -- are sufficient to link most pairs of people in the world. This is the small world phenomenon. This phenomenon is of great practical importance. For example, political influence is transmitted over such chains of acquaintances. The small world phenomenon is also of great theoretical importance. There is the possibility that the small world phenomenon could shed light on the secret of how networks more generally give rise to emergent properties, such as the higher mental functions of neural nets and their analogs in social nets or computer nets. In Part I, the small world phenomenon is introduced. Part II describes the small world phenomenon in some of its various uses and actual manifestations, which are to be explained by experimentation and analysis. Part III gives an account of advances in experimental and empirical methods and of what is being discovered in using them. Part IV features some new theoretical approaches and new conceptualizations.

Kock, Christof, & Segev, Idan. (1988). *Methods in Neuronal Modeling: From Synapses to Networks.* **Cambridge, MA: MIT Press. (448 pp., $45.00).**

This book is the first technical handbook on computational neuroscience. It outlines methods and techniques used for simulating on digital computers the functional properties of single neurons from synapses, dendrites, single cells, and small invertebrate networks to large-scale neural networks in the mammalian nervous system. Each chapter concludes with a description of the model discussed and the details of its implementation on the computer.

Lavit, C. (1989). *Analyse Conjointe de Tableaux Quantitatifs.* **Paris: Masson. (252 pp.)**

This book presents a method (STATIS) for joint analysis of several matrices of numerical variables using techniques related to those of Principal Component Analysis. It contains all the elements required for the reader interested in the STATIS method to understand the technique. One finds: the type of data to which it applies, a formal presentation of the calculations in the linear applications language as well as in matrix language and several examples of applications.

Levine, David. (1987). *Reproducing Families: The Political Economy of English Population History.* **Cambridge: Cambridge University Press. (251 pp., $34.50 cloth; $9.95 paper).**

Levine interprets the changing articulation of production and reproduction in England from 1066 until the decades between the two world wars. Levine's essay is an extended dialogue, in which the Malthusian model of population growth interacts with limited resources to yield poverty and eventual demographic costs. Levine uses Wrigley and Schofield's (1981) data to trace what he calls the "industrialization" and later the "proletarianization" of the "cottage economy." Levine agrees with Wrigley and Schofield that age of marriage was the key determinant of birth rates, yet rejects their "dilatory homeostasis" model. Levine argues that marriage age and birth rates are determined by the contemporaneous prospects for establishing a new family. The era of high birth rates was limited at both ends by cultural factors. Levine contends that patriarchy and the social networks open only to landholding peasants combined to encourage families, even in the eighteenth century, to delay marriage and limit children in order to maintain a foothold in the cottage economy. Peasants increased family size -- and maximized income from children -- only after they had been proletarianized and thereby removed from the "moral economy of patriarchalism." Once families began to respond instead to the "political economy of capitalism" they became targets for a ruling-class ideology that condemned "idleness," even as enclosure created unemployment and vagabondage.

Madan, T.N. (1989). *Family and Kinship: A Study of the Pandits of Rural Kashmir.* **OUP India. (320 pp., $41.50).**

Since its first edition, this book has been recognized in anthropological and sociological circles as an ethnographically rich account of the Hindu family. The book describes a typical Kashmiri homeland and examines the composition and models of recruitment to the household. This enlarged edition has three new appendices, a revised list of references, and a new index, although the text remains unchanged.

McCartney, Laton. (1988). *Friends in High Places: The Bechtel Story -- The Most Secret Corporation and How It Engineered the World.* **New York: Simon & Schuster. (273 pp., $19.95).**

In this book, Laton McCartney discusses how the Bechtel Corporation -- an international engineering firm -- became not only a technological, but also an economic, political, and diplomatic force to be reckoned with. One key to Bechtel's success was that it discovered early the attractiveness of turnkey operations. The company was pleased to build entire facilities and simply turn them over to clients, ready to go. This service included the necessary bribes to Arab princes, low- interest loan arrangements from the Export-Import Bank, changes in presidential policy, and enthusiastic projections by "disinterested" think tanks. Bechtel was able to make these delicate arrangements because the family had "friends in high places," as the title has it. This account demonstrates that Bechtel's success was based in large part on its ability to shape the social context of its technological activity.

Morgan, K., & Sayer, A. (1988). *Microcircuits of Capital.* **Oxford: Polity Press. (321 pp., 35.00 pounds).**
This book is an account of the evolution and regional differentiation of the electronics industry in the UK and of the impact of the industry on host regions. The interpretive framework is basically Marxist, though this theoretical starting point is never allowed to determine conclusions. Rather, an interplay between theoretical concepts, empirical results and the interpretation of key actors in the development process provides Morgan and Sayer with the basis for their account. The authors assess the prospects for the electronics industry in Britain in light of current economic policies, and speculate on the scope for an industrial strategy based on European cooperation, a more selective attitude towards inward investment, shifting resources out of defense electronics, and more decentralized support for innovation diffusion. The authors combine concepts from different theoretical traditions (Marxist, business organization, industrial policy analysis) and reject or qualify concepts that do not do justice to the complexity of the issues under scrutiny.

Mosco, Vincent, & Wasko, Janet. (1988). *The Political Economy of Information.* **Madison: University of Wisconsin Press. (334 pp., $40.00 cloth; $17.50 paper).**
This book is divided into three sections: chapters 2-5 address questions involving the theoretical significance of information, chapters 6-11 explore specific domains in which the role and consequences of a political economy of information are revealed, and chapters 12-14 add to those observations a specifically international cast. This book documents how developments in information technology are driven by political and corporate interests that would use the technologies to "increase profit and extend control over workers and consumers."

Nadel, Lynn (ed.). (1989). *Neural Connections, Mental Computation.* **Cambridge, MA: MIT Press. (320 pp., $39.95).**
This book is a multidisciplinary investigation into connectionism as an alternative to traditional symbolic cognitive models. The authors address these questions: Are connectionist models computationally sufficient to account for complex cognitive functions? Can connectionism account for such functions in a neurobiologically realistic way? Contributors include: Valentino Braitenberg, Patricia Smith Churchland, Gerald Edelman, Jerome Feldman, Gary Lynch, Richard Granger, John O'Keefe, Terrence Sejnowski, Paul Smolensky, and Roger Shepard.

Noel, S.J.R. (1990). *Patrons, Clients, and Brokers: Ontario Society and Politics, 1791-1896.* **(328 pp., $45.00 cloth; $18.95 paper).**
Noel argues that the patron-client bond, expanded and complicated by the role of a broker, eventually became the basis of provincial party politics in post-Confederation Ontario. As the province evolved through various stages of agricultural, resource-based, and industrial development, so too did the cement that held together the decentralized, brokerage-based political formations of the mid-nineteenth century. And later, to meet the new exigencies of post-Confederation politics, it was crafted into the structure of Ontario's first large-scale, cohesive, recognizably modern political party: the Liberals of Oliver Mowat. Noel develops a theory of clientelism to explain the gradual evolution of the key linkages in the political process from simple patron-client dyads to progressively more complex forms of brokerage and machine politics.

Oliker, Stacy J. (1989). *Best Friends and Marriage.* **Berkeley, CA: University of California Press. (321 pp., $20.00).**
Stacy Oliker delves into the intimate realm of women's friendships and family life. Based on a series of interviews with women from the middle and working classes, this book reveals the distinctive values of best friendship and marriage, how husbands and their wives' friends feel about one another, and how women's friends talk about marriage problems. This book suggests that close friendships provide women with unique sources of intimacy, affection, identity, and community. In this book, the institutions of family and friendship are linked in explaining intimacy in sociological and historical as well as psychological terms.

Perrucci, Robert, & Potter, Harry (eds.). (1989). *Networks of Power: Organizational Actors at the National, Corporate, and Community Levels.* **Hawthorne, NY: Aldine de Gruyter. (136 pp., $36.95 cloth; $15.95 paper).**
This book explores how large organizations are able to extend their influence beyond a single community or nation-state, and how networks among large corporations impact decision-making at the national and multinational

level to achieve their own goals. The book applies interorganizational analysis to the study of power in three main areas: national policy domains, community influence structures, and national corporate structures.

Pinker, Steven, & Mehler, Jacques (eds.). (1988). *Connections and Symbols.* **Cambridge, MA: MIT Press. (255 pp., $17.50).**

This book raises issues that lie at the core of our understanding of how the mind works: Does connectionism offer a truly new scientific model or does it merely cloak the old notion of associationism as a central doctrine of learning and mental functioning? Which of the new empirical generalizations are sound and which are false? And which of the many ideas such as massively parallel processing, distributed representation, constraint satisfaction, and subsymbolic or microfeatural analyses belong together, and which are logically independent? Common themes emerge from the contributors: criticism of connectionist models applied to language or the parts of cognition employing language-like operations; and a focus on what it is about human cognition that supports the traditional physical symbol system hypothesis. While criticizing many aspects of connectionist models, the authors also identify aspects of cognition that could be explained by the connectionist models.

Pollock, Linda. (1987). *A Lasting Relationship: Parents and Children Over Three Centuries.* **Hanover, NH: University Press of New England. (319 pp., $25.00).**

This anthology makes easily available for the first time extensive excerpts from diaries, memoirs, autobiographies, letters, and account books concerning the home life of children in England, Scotland, and North America for the three centuries from 1600 to 1900. These personal accounts reflect parental views on the bearing of children; caring for them; childhood accidents, illness, and death; children's daily activities, play, and recreation; childrearing and discipline; moral, religious, and academic education; and intergenerational conflict. The anthology is based on the writings of persons from the middle and upper social classes, since most persons from the working and lower classes were not able to read and write in those times. Pollock's anthology suggests that many important aspects of the parent- child relationship have changed little since 1600, except for the advent of compulsory, universal education.

Popenoe, David. (1988). *Disturbing the Nest: Family Change and Decline in Modern Societies.* **Hawthorne, NY: Aldine de Gruyter. (420 pp., $49.95).**

Popenoe attempts to provide an objective analysis of family change to present as much solid knowledge as possible about how the institution of the family in modern society is changing, why it is changing, and what the social implications of that change may be.

Quale, G. Robina. (1988). *A History of Marriage Systems.* **Westport, CT: Greenwood. (399 pp., $45.00).**

This work is an attempt by historian G. Robina Quale to present a history of marriage systems throughout the ages. Quale uses the term "marriage systems" to describe the patterns or sets of rules in different societies concerning the establishment, continuance, dissolution, and reestablishment of marriage. Following two preliminary chapters that deal with such topics as the relationships between rules of marriage and socioeconomic conditions, the functions of exogamous regulations, and the demographic realities within which all family systems must operate, the author opens her journey through history with some speculative observations regarding the formation of families in early human groupings. In the remaining nine chapters she traces, for each of the major regions of the world, the modifications in marriage patterns from the rise of herding and agriculture to commercial urban societies and on to contemporary industrial life. This work incorporates theoretical and empirical contributions from a multitude of disciplines. It devotes considerable attention to contemporary trends and consistently relates the institution of the family to the overall socioeconomic, political, and demographic contingencies within society.

Rose, Clive. (1989). *The Soviet Propaganda Network: A Directory of Organizations Serving Soviet Foreign Policy.* **New York: St. Martin's. (313 pp., 29.50 pounds).**

The author's purpose is to detail the 'active measures' pursued by the Soviet Union to enhance its image and interests abroad. It covers everything from the British-Soviet Friendship Society to the Asian Buddhist Conference for Peace. British readers will be particularly intrigued by lists of organizations proscribed by the British Labor Party. Others will value the details on such well known institutes such as the Institute for World Economy and International Relations (IMEMO).

Saris, Willem E., & Gallhofer, Irmtrand (eds.). (1988). *Sociometric Research, Volume 1: Data Collection and Scaling.* **New York: St. Martin's Press. (246 pp.).**

This book contains a series of 14 separate but related reports on research in the area of survey analysis drawn from papers presented at the International Sociological Association's first international methodology conference. This book reflects the growing tendency to employ non-classical nonparametric statistical procedures, the growing dissatisfaction with binary choice survey questions, the growing necessity of utilizing simulation and specialized software in order to analyze particular models and data, and a resurgent interest in extracting respondent's mental models but in a quantified form.

Shanin, Teodor. (1990). *Defining Peasants: Essays Concerning Rural Societies, Expolary Economies, and the Learning from them in the Modern World.* **Basil Blackwell. (256 pp., $82.50).**

In this book, peasant studies are set within the broader context of development theory. It includes debates which focus on the nature and dynamics of so-called "developing societies," republishing two of the papers which laid the foundations for the debate on the nature of peasant societies and merging new and well-established articles in four major areas: the conceptualization of peasantry, aspects of peasant particularity (the peasant economy, migration, culture, and political action), methodology, and studies of the most influential theorists.

Smith, Christopher. (1988). *Public Problems: The Management of Urban Distress.* **New York: Guilford Press. (276 pp., $19.95).**

This volume introduces an approach to analyzing the problems currently afflicting the modern city. Defining public problems as those issues that have become matters of such urgency that official action is required by public agencies, Smith adopts an interdisciplinary perspective that considers the historical, political, economic, and environmental factors that influence their etiology. He also consider how distance, accessibility, location, and movement affect the delivery of services. With a focus on three representative public problems (substance abuse, delinquency, and mental illness), he illustrates how methodology and data from the fields of sociology, psychology, public health, and geography can be integrated for more effective measurement and management of problems of public concern. Rather than arguing for an independent, self-contained "geography of public problems," this volume demonstrates that the addition of geographic information to knowledge in various other social science fields can contribute significantly to a greater understanding of the problems that plague the urban population.

Walker, David W. (1987). *Kinship, Business, and Politics: The Martinez del Rio Family in Mexico, 1823-1867.* **Austin, TX: University of Texas Press. (278 pp., $27.50).**

This is the story of the business life of two generations of a Panamanian merchant family in early republican Mexico, one of countless Spanish and Creole merchants who were obliged swiftly to adapt to the collapse of the Spanish empire and the intrusion of other European and North American merchants into what had hitherto been their exclusive preserve. The family established one of Mexico's principal export-import houses, founded the best known banking firm and owned the country's most modern textile mill. Yet, ultimately, the family firm went bankrupt, the family's fortune not returning until well into the Porfiriato. David Walker, who has gained access to the family papers, sets out to explain why the family's business endeavors failed. The breadth of its activities, its cosmopolitanism, its aspiration to be considered part of Mexico's elite, yet its painful exclusion from the inner circle of Santa Anna's Mexico, make this an incomparable source for understanding this 'enigmatic' period. By a close examination of the social strategies and business practices of this family, Walker diagnoses the state of the entire post-independence Mexican economy. Walker examines the 'function' of the family in what he calls the 'social economy' (an economy in which business activity depended heavily upon kinship or fictive kinship ties).

Wallerstein, Immanuel. (1989). *The Modern World-System III: The Second Era of Expansion of the Capitalist World-Economy, 1730-1840.* **New York: Academic Press. (372 pp., 39.50).**

Volume 3 is the latest of *The Modern World-System*, in which Wallerstein covers world-system developments between the 16th century and tomorrow. The agenda for this third installment is to analyze, within a single theoretical apparatus, the birth and spread of modern capitalism and its transformation into a global system.

Walston, James. (1988). *The Mafia and Clientelism: Roads to Rome in Post-War Calabria.* **London: Routledge. (265 pp., 35.00 pounds).**

Walston's work is an analysis of the importance of Mafioso activities in contemporary Italian politics. By intertwining the concepts of clientelism and delinquency, the author successfully shows the extent to which Calabrian society has projected itself beyond its geographical domain to exercise influence and power in Rome.

Ware, Lan. (1989). *Between Profit and State: Intermediate Organizations in Britain and the United States.* **Princeton: Princeton University Press. (308 pp., $42.50).**

In this book, Ware discusses nonprofit organizations' relationship to the private and public sectors. As Ware points out, nonprofits are now significantly entwined with the public sector. Apart from the ways in which tax and regulatory policies affect them, nonprofit groups in the United States now receive over one-quarter of their income in the form of grants and payments for carrying out government programs. Ware cautions that if nonprofits identify too closely with the public sector, they may forfeit much of what distinguishes them from government. In reference to their involvement to the private sector, Ware maintains that as voluntary groups derive more of their revenues from sales and contracts, commercial considerations are more likely to govern their activities than charitable ones. And even gifts often come with strings attached, or for purposes important mostly to the donor. As a result, the actual nature of private funding may incline the "independent sector" more toward preserving a healthy balance sheet than responding to pressing social concerns.

Wilmott, Peter. (1989). *Community Initiatives: Patterns and Prospects.* **Oxford, UK: PSI Publications.**
Peter Wilmott's review of community initiatives is in two parts. In the first, he takes a broad look at what has been happening, exploring the role of community and the influence of community policies and initiatives in modern Britain. The second part of the review comprises case studies examining particular community initiatives. The key questions with each are what the community element really means and how far in practice the promise is matched by achievement. These case studies provide the material on which the broader analysis is based. Detailed examinations of community groups and projects, local government decentralization, community care, community policing, and community architecture are complimented by eight briefer portraits, covering for example, community work, community development, and community education and business.

ABSTRACTS:

Journals

Adan, Ivo, & Van der Wal, Jan. (1989). Monotonicity of the throughput of a closed queuing network in the number of jobs. *Operations Research, 37,* **953-957.**

In this paper, the authors use a sample path argument to establish the intuitively obvious result that for the closed queuing network with general service times the throughput does not decrease if an extra job is added to the network. Monotonicity is studied to obtain estimates for the performance of nonproduct form networks by bounding the network between product form networks. In Section 1, the model, some notation and the theorem are given. In Section 2, the theorem is proved for the case that all stations are single servers. The case of multiservers is treated in Section 3.

Andreoni, James. (1989). Giving with impure altruism: Applications to charity and Ricardian equivalence. *Journal of Political Economy, 97,* **1447- .**

Models of giving have often been based on altruism. Examples include charity and intergenerational transfers. The literature on both subjects has centered around the neutrality hypotheses: charity is subject to complete crowding out, while intergenerational transfers are subject to Ricardian equivalence. This paper formally develops a model of giving in which altruism is not "pure." In particular, people are assumed to get a "warm glow" from giving. Contrary to the previous literature, this model generates identifiable comparative statics results that show that crowding out of charity is incomplete and that government debt will have Keynesian effects.

Ayalon, Hanna, Ben-Rafael, Eliezer, & Sharot, Stephen. (1989). Ethnicity, class and friendship: The case of Israel. *International Sociology, 4,* **293-310.**

Debates over the forms and levels of ethnic pluralism and the relationship between class and ethnicity in the Israeli Jewish population provide the background of an analysis of friendship networks of four groups of origin, two from the Middle East and two from Europe. It is shown that, whereas only small minorities have homogeneous networks based on country of origin, the broad ethnic division between white-collar and blue-collar workers are important bases of friendship. Differences among the eth-class categories in the ethnic heterogeneity/homogeneity of their networks are largely a consequence of the class distribution of Jews of Middle Eastern and European origin in Israeli society.

Basu, Kaushik. (1989). A theory of association: Social status, prices and markets. *Oxford Economic Papers, 41,* **653- 671.**

This paper looks at a special class of goods and services. It is a study of commodities (services, memberships, awards, and commodities), the utility from which depends on who its other recipients (or consumers) are. Basu shows that the value to an individual of an award or a prize does not depend on merely its inherent value -- for example, the gold in an Olympic medal. It depends on the allocation rule itself which is used to decide who will receive the awards. If the awards are allocated by a rule which picks the 'best' or most talented, they would have a certain value to the recipients. If they are allocated via the price mechanism, they would have another value. By acquiring such a commodity a person tries to gain association, in the eyes of fellow human beings, with its other recipients or consumers. This paper illustrates the role of association goods in understanding several real-life phenomena, especially the existence of excess- demand and excess-supply equilibria, through a series of simple models.

Baulieu, F.B. (1989). A classification of presence/absence based dissimilarity coefficients. *Journal of Classification, 6,* **233-246.**

Several desirable order properties for dissimilarity coefficients based on presence/absence of attributes are given and several popular dissimilarity coefficients are examined with respect to these properties. A characterization for rational functions with linear numerator and linear denominator satisfying all of the desirable properties is given.

Berg, John H., & McQuinn, Ronald D. (1989). Loneliness and aspects of social support networks. *Journal of Social and Personal Relationships, 6,* **359-372.**

The relationship between loneliness and both structural and social behavioral aspects of social support was investigated in a sample of 150 college students. Loneliness was found to be significantly correlated with self-disclosure and network density for both men and women. Significant correlations between loneliness and network size and network multiplexity were found only for men. Together the four different aspects of the support network accounted for 32 percent of the variance in men's loneliness scores and size, multiplexity, density, and self-disclosure each made significant individual contributions. For women, these four variables together accounted for 19 percent of the variance in loneliness and self-disclosure was the only factor to make a significant individual contribution when controlling for the others.

Bielby, William T., & Bielby, Denise. (1989). Family ties: Balancing commitments to work and family in dual earner households. *American Sociological Review, 54,* **776- 789.**

This paper examines the process by which married men and women form and balance work and family identities. Hypotheses derived from alternative conceptualizations of the commitment process are tested with data from the 1977 Quality of Employment Survey. We find that for both men and women, engagement in work and family roles leads to identification with those roles. However, the process of identity formation differs for men and women in ways that correspond to gender-based differentiation in household and workplace activities. Married women employed outside the home give precedence to family in balancing work and family identities, while married men may have the discretion to build identification with work and family roles without trading one off against the other. Despite differences in the process of commitment formation, our results suggest that when men and women engage in similar work and family roles, they are almost equallycommitted to those roles.

Bo, Inge, & Cochran, Moncrieff. (1989). The social networks, family involvement, and pro- and antisocial behavior of adolescent males in Norway. *Journal of Youth and Adolescence, 18,* **377-398.**

The focus of this study is on the ecology of pro- and antisocial behavior. The study was conducted in Stavenger, Norway, with a representative sample of ninety-two 16-year old boys. Data collected includes socioeconomic background, neighborhood risk level, amount of time spent with parents and peers, maps of social network relations, self-reports of alcohol use and criminal activity, and school reports of academic performance, truancy, school motivation, and social behavior. Analysis of results produced two models linking background and process with outcome variables: (A) higher neighborhood risk and less time spent by the boys with their parents were linked with greater propensity for self-reported alcohol use and illegal activity, and (B) more educated parents and larger numbers of nonkin adults in the boy's network were related to better school performance, less absenteeism, and more positively evaluated social behavior. Discussion of these findings centers on the neighborhood and family process involved in social control and on adult network members in their roles as positive models, norm reinforcers, and sources of information for adolescent boys.

Boies, John L. (1989). Money, business, and the state: Material interests, Fortune 500 corporations, and the size of political action committees. *American Sociological Review, 54,* **821-833.**

This paper uses data from the Federal Elections Commission on political action committees, sponsored by Fortune 500 industrials in 1976 and 1980, to examine the determinants of business PAC size. Of the five groups of variables suggested by the extant PAC literature -- availability of resources, free rider problems, material interests, previous campaign activity, and industry categories -- just the measures of material interests have consistent and important effects on the level of firm political activity. Firms with the richest history of interaction with the state, top defense contractors, major acquirers of other business, and corporations prosecuted for criminal acts are the most politically active of large firms. Thus, while material interests are an important determinant of political action, this study suggests only interests tied to special long-term relationships with the state serve to increase the amount of political action taken by large firms. These results suggest that the pluralist-based theory of business political involvement, so widely accepted among contemporary PAC researchers, is of little utility for explaining firm differences in political activity.

Borgatti, Stephen P., Boyd, John, & Everett, Martin. (1989). Iterated roles: mathematics and application. *Social Networks, 11,* **159-172.**

Recent work by Borgatti and Everett (1989) has shown that the collection of regular equivalences described by White and Reitz (1983) forms a lattice. In this paper, we present a procedure called **iterated roles** for tracing systematic paths through the lattice. At the heart of iterated roles is the proof that the regular equivalence is itself regular. The procedure enables us to find several otherwise unknown regular equivalences, including an extension of automorphic equivalence (Everett 1985) that is not sensitive to degree. A key benefit of iterated roles is the generation of sequences of hierarchically nested equivalences. This capability suggests an approach to role structure analysis in which one examines not just one blocking of actors but a series of increasingly broad implications of the data. Consequently, we are able to (a) choose the level of simplification that proves most illuminating, and (b) view both to see the broad structural outlines and the finer details of the datasimultaneously.

Borgatti, Stephen P., & Everett, Martin G.. (1989). The class of all regular equivalences: Algebraic structure and computation. *Social Networks 11,* **65-88.**

In this paper, we explore the structure of the set of all regular equivalences (White and Reitz 1983), proving that it forms a lattice, and suggest a general approach to computing certain elements of the lattice. The resulting algorithm represents a useful complement to the White and Reitz algorithm, which can only find the maximal regular equivalence of a graph. Using this algorithm, it is possible to compute several well-known equivalences, such as structural equivalence (Lorrain and White 1971), automorphic equivalence (Everett and Borgatti 1988), and Winship-Patison equivalence (Winship and Mandel 1983). In addition, any number of other useful equivalences may be generated, providing suitable mathematical descriptions of them are available.

Boyd, Robert, and Richerson, Peter J. (1989). The evolution of indirect reciprocity. *Social Networks, 11,* **213-236.**

Human societies are based on cooperation among large numbers of genetically unrelated individuals. This behavior is puzzling from an evolutionary perspective. Because cooperators are unrelated it cannot be the result of kin selection, and the large scale seems to preclude explanations based on direct reciprocity. Alexander (1987) has proposed that large-scale cooperation among humans can be understood as resulting from networks of "indirect" reciprocity. For example, individual A may help individual B even though A receives no direct reciprocal benefit. Instead, B might help C who helps D who finally returns the help indirectly to A. Here we describe a simple mathematical model of the evolution of indirect reciprocity. Analysis of this model suggests that indirect reciprocity is unlikely to be important unless interacting groups are fairly small.

Bradley, Raymond Trevor, & Roberts, Nancy C. (1989). Network structure from relational data: Measurement and inference in four operational models. *Social Networks 11,* **89-134.**

An empirically-based assessment of the operational procedures routinely used in network analysis reveals serious measurement deficiencies that render spurious images of network structure. Based on explicit, exhaustive measurement along three basic relational dimensions, an alternative approach is described that resolves these problems. The three dimensions (type of relation, the relation's existential status, and level of analysis) combine to create a general framework for classifying and assessing a range of relational operational procedures in terms of measurement capability and inference potential.

Broadbent, Jeffrey. (1989). Strategies and structural contradictions: Growth coalition politics in Japan. *American Sociological Review, 54,* **707-721.**

The elite coalition that pushes local industrial growth is composed of six actors: local state, business, and party and national state, business, and party. The question of which dominates the coalition reflects current debates about the structure of power in capitalist society. This paper addresses these debates through the detailed study of a growth coalition in a rural industrialization project in southern Japan. It traces the strategies and modes of influence of the six actors, their structure and process, through the 25-year history of the project. Contrary to the "strong state" image of Japan, national big business dominated the growth coalition. The rest of the society, including the state, adjusted around its motion. This resulted in policies which favored economic growth over social needs, giving some of the other actors legitimation problems. Yet, success at rapid growth prevented these from assuming crisis proportions. The findings run counter to state autonomy arguments and suggest closer attention be paid to multiple levels of structure and process.

Bridges, William P., & Nelson, Robert L. (1989). Markets in hierarchies: Organizational and market influences on gender inequality in a state pay system. *American Journal of Sociology, 95,* **615-658.**

A pivotal issue in sociological theories of labor markets, as well as legal and policy debates on pay equity, is the relative importance of market and organizational forces in determining pay differences between jobs held predominantly by men and those held predominantly by women. This article develops two models of the market organizational relationship -- an administered-efficiency model and a bureaucratic-politics model. Quantitative analyses of individual and job-level data in a state government pay system indicate that the administered efficiency model does not adequately explain male-female earnings differences. Documentary, testimonial, and interview data strongly suggest the significance of the bureaucratic politics model in the pay-determination process. The authors conclude that market forces influence wage rates but are heavily mediated by organizational factors unrelated to efficiency considerations in the type of organizations studied here.

Burt, Ronald S., & Carlton, Debbie S. (1989). Another look at the network boundaries of American markets. *American Journal of Sociology, 95,* **723-753.**

Measuring transactions as proportional variables rather than as marginal variables produces important differences in our images of economic networks. Market boundaries defined by proportional transactions emphasize the differences among specialized markets (production markets with a single principal supplier or consumer market). Boundaries defined by marginal transactions emphasize the differences among diversified markets (production markets defined by unique transaction patterns with multiple supplier and consumer markets). The results reported here with marginal measures of transaction strength offer a substantially richer map of market boundaries than the results that Burt reported with proportional measures. These findings promise to guide organizational research by offering clearer distinctions among the market environments in which organizations operate. Proportional transaction measures are well suited to their traditional use in economic input-output models tracing the flow of resources through a network. Marginal transactions are the more useful measures for sociological studies of market boundaries for organizational analysis, more clearly revealing variation in the resource-flow patterns that define structurally equivalent (substitutable) production activities as a market.

Caldwell, Robert A., Bogat, G. Anne, & Cruise, Karen. (1989). Brief report: The relationship of ego identity to social network structure and function in young men and women. *Journal of Adolescence, 12,* **309-313.**

Psychosocial development has been conceptualized as a progression of changes in the way people understand others and the nature of their relationships with them. As children get older, increasing numbers of non-related individuals are added to the social network, displacing some extended family members. Gender differences in ego identity formation may also influence the development of social networks. The subjects for the present study were college students who were administered a measure of ego identity and a social network scale. This population was chosen because the greatest growth in identity formation seems to occur during late adolescence/young adulthood; thus, these subjects could inform our knowledge of developmental changes in social networks. We hypothesized that increasingly mature levels of development would be positively related to size of network, satisfaction with support, and the proportion of peers in the network. Further, it was hypothesized that, compared with men, women would have larger social networks, a larger number of persons providing emotional support, and greater mutuality in their social networks. Finally, both men and women were expected to have more same-sex network members than opposite-sex members.

Galasi, Peter, & Sik, Endre. (1988). Invisible incomes in Hungary. *Social Justice, 15,* **160-178.**

Despite two decades of pace-setting economic reform, Hungary has found itself in a prolonged economic crisis with the standard of living declining in each of the last 10 years. Debate rages within Hungary as to the direction and character of further political and economic reforms. The following article by two leading Hungarian social scientists argues that the informal economy within Hungary has been a necessary stabilizing factor in light of the economic crisis, providing much-needed goods and services not available through the socialist or formal sector. They differ with the previous article by Sampson, who argues that "state policies of integrating the second economy into the formal economy have resulted in long-term undermining of the formal economy." In Galasi and Sik's view, the growth of invisible incomes, which are gained through the informal economy, is a symptom of the general failure in performance of the formal economy; thus, repressive measures undertaken by the state or political leadership to suppress these incomes can only lead to further deterioration of the economy as a whole.

Gandy, Oscar H., Jr. (1989). The surveillance society: Information technology and bureaucratic social control. *Journal of Communication, 39(3), 61-70.*

Advanced electronic technologies dramatically increase the bureaucratic advantage in the workplace, marketplace, and government by enabling -- and encouraging -- increasingly automatic methods of surveillance of the individual that the U.S. legal system cannot control.

Garnier, Maurice, Hage, Jerald, & Fuller, Bruce. (1989). The strong state, social class, and controlled school expansion in France, 1881-1975. *American Journal of Sociology, 95,* **279-306.**

Current theories argue that school expansion reflects demands that stem from changes in the occupational structure, from an ideological commitment to building an integrated nation-state, or from the processes of modernization. However, these theories have not been tested relative to different social classes. Since most of the evidence has accumulated in the United States, where demand is usually met by supply, the possibility that demand might not be met has been ignored. This article relies on the concept of controlled expansion, testing whether the policies and politics of the central French state influenced the expansion of secondary schooling between 1881 and 1975. The states' policies regarding the supply of pupil spaces and the improvement of quality affected actual enrollment growth when the influence of labor structure and institutional values is controlled. Importantly, both economic demand and state supply exert differing levels of influence on the elite school system versus the mass system.

Gerhards, Jurgen, & Anheiter, Helmut K. (1989). The literary field: An empirical investigation of Bourdieu's sociology of art. *International Sociology, 4,* **131-146.**

Bourdieu describes the structure of society as a result of class conflicts and status competition. Art in general, and the literary field in particular, is interpreted as a differentiated social field that is autonomous in the sense that it follows its own logic -- the competition for cultural legitimation. What literature has in common with other social systems is the stratification of its internal structure into a hierarchical arrangement. Thus the literary field can be described as a horizontally differentiated system that is, however, vertically differentiated internally. The concern of the paper is to test Bourdieu's theoretical considerations empirically. Data for the analysis and interpretation are based on interviews of Cologne writers. The data are analyzed with the aid of blockmodel and correspondence analysis. As far as the data allows us to operationalize the thesis that the literary field is an autonomous differentiated system, Bourdieu's thesis is confirmed. The internal structure can be described more precisely: the first line of demarcation is, in fact, the difference that Bourdieu described between legitimate and illegitimate art: high-culture literature and low-culture literature are the two poles of the literary field. The realm of the legitimate literature is further differentiated into the blocks (elite, junior elite, periphery). The elite and the periphery differ in terms of the different degrees of success. The junior elite occupies an intermediate place. Bourdieu's sociology of literature is supported by the empirical material at hand.

Ghorayshi, Parvin. (1989). The indispensable nature of wives' work for the farm family enterprise. *Canadian Review of Sociology & Anthropology, 26,* **571-595.**

This paper argues that the contributions of farm wives are essential for the survival of the farm family enterprise. Our case study of St. Charles, Quebec, confirms the emphasis of other studies on the multi-dimensional role of the farm wife. However, property relations, methods of data collection, research frameworks and the women themselves ignore, underestimate, de- emphasize or conceal this role. This paper questions such treatment and the perception of women's role in farming and calls for the identification of forces that have mystified our view of work in general, and farm wives' work in particular. Any analysis of farming which omits or de-emphasizes wives' work presents a misleading view of agricultural structures.

Gillis, A. R. (1989). Crime and state surveillance in nineteenth-century France. *American Journal of Sociology, 95,* **307-341.**

Historians and other social scientists argue that cultural change and increasing civility generated a five-century decline in rates of violent crime. This study presents a structural perspective that indicates that, as emerging nation-states consolidated power, they also extended surveillance, and this deterred crime. The proposition is tested in France, between 1865 and 1913, where rates of major crimes declined and minor offenses increased as state surveillance expanded in the form of two national police forces. A time-series analysis suggests that, although the growth of policing initially increased charges for all types of crime, for major crimes the long-run effect was deterrence and declining rates. Subsequent deterrent effects failed to compensate for the initial inflationary effect on minor offenses, so rates increased. The effect of policing on major property crimes holds when the possibility of reclassification of such crimes as minor offenses is controlled, but the deflationary effect of policing on major crimes of violence disappears when urbanization is introduced as a control. The other relationships persist, further supporting the idea that policing contributed to the decline in serious property crime. A reversal of the equations shows that crime rates had little or no effect on the growth of national policing. This, and historical evidence, suggests that state surveillance expanded less from a specific intent to control crime than from a broader interest in repressing "dangerous classes," new repertoires of social protest, and political challenge to the state.

Greeley, Andrew. (1989). Protestant and Catholic: Is the analogical imagination extinct? *American Sociological Review, 54,* **485-502.**

The notion of the "Protestant Ethic" is reconceptualized to reflect theoretical expectations about the difference between the "Dialectical Imagination" and the "Analogical Imagination." Protestants are expected to be individualist because of an imagination of society as "sinful and God-forsaken." Catholics are expected to be communitarian because of an imagination of society as sacramental, that is, revelatory of God. The research question is whether the analogical/communitarian imagination can persist in a world of industrialization, modernization, urbanization, and homogenization. The issue was tested against data from seven nations (36 variables) with the null hypothesis that denominational background does not predict value orientation. The null hypothesis was again rejected. Further testing with data and 13 hypotheses from only the United States tested the null hypothesis that differences in religious imagery could not account for some of the variance between Protestants and Catholics on value measure. This null hypothesis was also rejected.

Halaby, Charles N., & Weakliem, David M. (1989). Worker control and attachment to the firm. *American Journal of Sociology, 95,* **549-591.**

This article asks whether the exercise of choice and discretion over task-related aspects of a job strengthens or weakens the bond that ties workers to their employers. Past work on the relationship between worker control and attachment has been theoretically vague, and the empirical evidence generally consists of only positive associations between indicators of control and attachment. The research reported here changes this situation in two ways. First, it systematizes prevailing commentary through the formulation of a series of hypotheses that specify the intervening mechanisms through which control shapes attachment. Second, it incorporates these hypotheses into a model of the causal relations generating the association between control and attachment. The results of a covariance structure analysis largely confirm the hypotheses derived from past work even as they show that the total effect of control on attachment is virtually zero because positive indirect effects offset a negative direct effect. The findings suggest a rethinking of prevailing conceptualizations of the significance workers assign to control of their own immediate work process.

Hansen, P., Jaumard, B., & Frank, O. (1989). Maximum sum-of- splits clustering. *Journal of Classification, 6,* **177- 193.**

Consider N entities to be classified, and a matrix of dissimilarities between pairs of them. The split of a cluster is the smallest dissimilarity between an entity of this cluster and an entity outside it. The single-linkage algorithm provides partitions into M clusters for which the smallest split is maximum. We study here the average split of the clusters or, equivalently, the sum of splits. A (N**)algorithm is provided to determine maximum sum-of-splits partitions into M clusters for all M between N-1 and 2, using the dual graph of the single- linkage dendrogram.

Heller, Kenneth. (1989). The return to community. *American Journal of Community Psychology, 17,* **1-13.**

The goal of this paper is to rekindle an interest in community as an exciting research topic, and to return the study of community to prominence in community psychology's research agenda. According to the author, community psychologists tend to study individuals, not collective groups, and their bias is to focus on behaviors with clear health-related outcomes. Heller maintains that not asking about community structures reflects theoretical biases which, in turn, define the domain of relevant inquiry. The conception of community to which Heller is advocating we return is not a simple longing for **gemeinschaft** but a recognition that group attachments are at the core of the development of self-identity and self-efficacy. The study of community and group processes have an important place in psychological scholarship because these processes impact upon personal and social development. The conceptions of community that we develop must recognize its multifaceted nature and go beyond locality-based models of village and neighborhood to include the diversity of groups with which most of us identify and which give meaning to our lives.

Hummon, Norman P., & Doreian, Patrick. (1989). Connectivity in a citation network: The development of DNA theory. *Social Networks, 11,* **39-63.**

The study of citation networks for both articles and journals is routine. In general, these analyses proceed by considering the similarity of articles or journals and submitting the set of similarity measures to some clustering or scaling procedure. Two common methods are found in bibliometric coupling, where two citing articles are similar to the extent they cite the same literature, and co-citation analysis where cited articles are similar to the extent they are cited by the same citing articles. Methods based on structural and regular equivalence also seek to partition the article based on their positional location. Such methods have in common focus on the articles and portions of them. We propose a quite different approach where the connective threads through a network are preserved and the focus is on the links in the network rather than on the nodes. Variants of the depth first search algorithm are used to detect and represent the mainstream of the literature of a clearly delineated area of scientific research. The specific citation network is one that consists of ties among the key events and papers that lead to the discovery and modeling of DNA together with the final experimental confirmation of its representation.

Irwin, Manley R., & Merenda, Michael J.. (1989). Corporate networks, privatisation and state sovereignty: Pending issues for the 1990s? *Telecommunications Policy, 13,* **329-336.**

Since the 1980s the growing importance of the corporate network has raised sensitive policy issues in telecommunications relating to privatisation and national sovereignty. This paper explores these issues in relation to the corporate network and analyses the existing problems and those that will arise in the next decade. The authors examine the corporate network, its workings, its importance as a competitive strategy, especially in a global context, and explain how this causes policy tensions. The authors suggest that these tensions will not dissipate over time, but that they will continue to affect policy-making well into the 1990s.

Jenkins, J. Craig, & Brents, Barbara G. (1989). Social protest, hegemonic competition, and social reform: A political struggle interpretation of the origins of the American welfare state. *American Sociological Review, 54,* **891-909.**

Recent neo-Marxian and state-centric analyses of the origins of the American welfare state have misspecified the autonomy of the state, thereby conflating policy formulation with policy-making and missing the complex political struggles that shaped the formation of the Social Security Act of 1935. Synthesizing Poulantzas's "class struggle" theory of state with social protest theory and Domhoff's analysis of capitalist dominance, the authors advance a political struggle theory that identifies two major processes leading to social reforms: (1) sustained protest waves by excluded groups and threatened polity members that create a sense of political crisis among elites; and (2) hegemonic competition between capitalistic blocs that use policy- planning and electoral investments to promote alternative political programs. This model is then applied to the formation of the Social Security Act. Unemployed protests, industrial strikes, and middle-class reform movements, interacting with electoral instability, created an elite sense of political crisis. Simultaneously, rival capitalistic blocs centered in bank groups and industrial segments competed for political dominance, creating opportunities for protest and placing major reforms on the national political agenda.

Johnson, J.C., Boster, J.S., & Holbert, D. (1989). Estimating relational attributes from snowball samples through simulation. *Social Networks, 11,* **135-158.**

The difficulty of studying large networks is widely recognized by social network researchers. The fuzzy boundaries of networks and the high cost of data collection often make the exhaustive exploration of a social network impractical. Researchers have applied a variety of alternative procedures for sampling social networks (such as snowball sampling) and have discussed the adequacy of statistics for estimating a variety of network population parameters. However, little empirical work has been done on these estimates of social network parameters. With the use of computer simulations, this paper examines estimates of centrality in snowball samples that vary in initial sample size, number of stages, and number of choices. The effects of varying sample parameters on estimated error is discussed.

Joyce, Jon A. (1989). Effect of firm organizational structure on incentives to engage in price fixing. *Contemporary Policy Issues, 8,* **.

This article examines price fixing and bid rigging by applying the theory of the economics of crime to explain the calculus of the individual decision maker in the firm. This approach departs somewhat from the traditional approach to investigations of collusion. The latter has emphasized market structure and firm interrelationships while it has ignored the characteristics of the firm itself. But analyses ignoring firm organizational and financial structure are incomplete insomuch as these factors are crucial to the incentives and costs that the decision maker confronts. This paper offers an alternative approach in which price-fixing and bid-rigging offenders' prominent characteristics apparently are mirrored in defendant firms and individuals that the Antitrust Division has prosecuted recently.

Kane, Catherine F. (1988). Family social support: Toward a conceptual model. *Advances in Nursing, 10,* **18-25.**

Nursing clinical assessment and empirical investigations of the social support resources available to families are hampered by the lack of theoretical bases regarding the family social support process. This article presents a preliminary conceptual model of family support in the interest of stimulating discussion and further development. Assumptions of the model are presented, family characteristics and interactions processes are identified, and propositional statements are derived from the model. The model proposes that social support is not an outcome or a resource but a process of interaction through which the family develops versatility and resourcefulness in identifying and using resources available in its environment. The conceptual model presents family social support as a process of relationships between the family and its social environment.

Kerckhoff, Alan C. (1989). On the social psychology of social mobility processes. *Social Forces, 68,* **17-25.**

For the past twenty years the status attainment model of social mobility has included social psychological measures which are used to help explain the levels individuals come to occupy in the stratification system. The early elaborations of the Blau-Duncan "basic model" of status attainment proposed by Sewell and others, modeled social psychological factors affecting educational attainment. More recently, two kinds of research have evolved which provide a basis for further clarification of the occupational attainment portions of the mobility model. One of these is the "new structuralism" approach to the world of work which has emphasized the importance of sectors of the economy, the structure of firms, vacancy chains, internal labor markets and career line. The other is the "work and personality" literature which is concerned with the interrelations between the structure of the work setting and the personal qualities of the worker. Suggestions are made for the integration of these approaches with earlier attempts to explain social mobility. Methodological and conceptual issues are discussed, and the need to recognize the interrelated contributions of structural and social psychological perspectives is emphasized. A life course approach to social mobility processes appears to provide the basis for accomplishing the needed integration of the structural and social psychological perspectives.

Kieser, Alfred. (1989). Organizational, institutional, and societal evolution: Medieval craft guilds and the genesis of formal organizations. *Administrative Science Quarterly, 67,* **540-564.**

A theoretical frame is developed that links the genesis of formal organizations to societal evolution. This theoretical frame lends itself to an analysis of the peculiarities of the craft guilds and the developments that caused their decline and replacement by formal organizations. Medieval guilds were not yet formal organizations but formed important predecessor institutions in the evolutionary process that led to the emergence of organizations.

Kind, Stuart S. (1989). Science and the hunt for the criminal. *Impact of Science on Society, 154,* **113- 123.**

Modern science is used in many ways in the solution of crime. These range from the examination of bloodstains in the laboratory, through fingerprint classification and searching, to the computer-mediated direction of crime investigation system. The author gives some illustrations of the involvement of science in this fascinating field.

Klare, Michael T. (1989). Subterranean alliances: America's global proxy network. *Journal of International Affairs, 43,* **97-118.**

Co-existing and sometimes overlapping with the network of formal military alliances established by the United States over the past 40 years is a second, informal alliance system composed of proxies, surrogates and paramilitary formations of various sorts. The formal alliance structures, notably NATO and the Australia- New Zealand-United States (ANZUS) Pact, are designed to protect the industrial heartland of the Western world against the expansion of Soviet power. The informal system is intended to support covert U.S. paramilitary operations against Soviet-backed regimes, and to facilitate U.S. military intervention in the Third World. Both alliance systems were forged in the early cold war period, but the relative importance ascribed to each has varied through the years. During the Truman and Eisenhower administrations, for example, high priority was accorded to the establishment of formal alliance systems. In more recent years, however, and especially in the Carter-Reagan period, greater emphasis has been placed on informal (and often secret) proxy relationships. This shift in emphasis from formal alliances to covert proxy arrangements is a product of altered world conditions and the changing priorities of U. S. foreign policy. In the late 1940s and early 1950s, when Europe and Asia lay in ruins and the Kremlin's expansionist impulse appeared irrepressible, the establishment of formal anti-Soviet alliance systems naturally assumed paramount importance. In more recent years, the threat of direct Soviet aggression has evidently subsided, and thus the maintenance of these systems has figured less prominently in U. S. strategic planning. However, although the apparent threat to Europe and Japan has diminished, American policy-makers have perceived an increased threat from Soviet involvement and subversion in the Third World. Countering this threat has been a major preoccupation of U. S. strategists since 1960; but because the American public has been reluctant (especially since the Vietnam War) to enter into formal, binding military alliances with Third World governments, Washington has tended to rely instead on informal military arrangement with friendly (or co-optable) forces and regimes.

Klauer, K.C. (1989). A mathematical programming approach to fitting general graphs. *Journal of Classification, 6,* **247-270.**

We present an algorithm for fitting general graphs to proximity data. The algorithm utilizes a mathematical programming procedure based on a penalty function approach to impose additivity constraints upon parameters. For a user-specified number of links, the algorithm seeks to provide the connected network that gives the least-squares approximation to the proximity data with the specified number of links, allowing for linear transformations of the data. The network distance is the minimum- path-length metric for connected graphs. As a limiting case, the algorithm provides a tree where each node corresponds to an object, if the number of links is set equal to the number of objects minus one. A Monte Carlo investigation indicates that the resulting networks tend to fall within one percentage point of the least-squares solution in terms of the variance accounted for, but do not always attain this global optimum. The network model is discussed in relation to ordinal network representations (Kauler 1989) and NETSCAL (Hutchinson 1989), and applied to several well-known data sets.

Kurdek, Lawrence A. (1989). Social support and psychological distress in first-married and remarried newlywed husbands and wives. *Journal of Marriage and the Family, 51,* **1047- 1052.**

In a study of the relation between social support and psychological distress, the providers of social support to husbands and wives in four types of newlywed couples were identified: those in which each spouse was married for the first time, those in which either the husband or the wife was married for the first time and the wife or the husband was remarried, and those in which each spouse was remarried. For all 427 subjects, the most frequently named providers of support were spouse, friends, and family of origin. With controls for background factors, couples in which each partner was remarried named members of their family of origin as providers of support less frequently than did couples in which each partner was married for the first time, and they named in-laws as providers of support less frequently than did each of the other couples. Across type of couple, wives reported more satisfaction with social support; the wives more frequently identified spouse, friends, family, kin, and in-laws as providers of support; and they had larger social support networks than did husbands. First-married wives reported more support from their families of origin than did their remarried husbands. Across spouse and type of couple, psychological distress was negatively related to both satisfaction with social support and the frequency with which spouse was named as a provider of support.

Lawless, Michael W., & Moore, Rita A. (1989). Interorganizational systems in public service delivery: A new application of the dynamic network framework. *Human Relations, 42,* **1167-1184.**

Many key activities in both the public and private sectors today occur in international networks involving high interdependence among otherwise autonomous agencies. Miles and Snow outline a special form of such systems called "dynamic network". It is characterized by vertical disaggregation, a flexible governance structure resembling a market mechanism, a single strategy maker in the role of a "broker", and shared information among members. The combination of these features distinguishes the dynamic network from other interorganizational systems. Miles and Snow claim their model is useful in both public and private settings. However, applications are, so far, limited to the private sector. Utilizing six comprehensive case studies, the authors examine the dynamic network model in public service delivery. New propositions are developed concerning structure and agency conduct in public interorganizational systems.

Lea, Martin. (1989). Factors underlying friendship: An analysis of responses on the acquaintance description form in relation to Wright's friendship model. *Journal of Social and Personal Relationships, 6,* **275-292.**

Wright provides a theoretical perspective of friendship based upon self-referent motives in which it is proposed that friendship is valued to the extent that it fulfills or facilitates the expression of self-referent rewards. The Acquaintance Description Form (ADF) has become an important measurement technique for studying personal relationships. Its construction rests partly on this theoretical perspective and partly on earlier empirical observations of friendship. The present study sought evidence to support Wright's theoretical model from an analysis of the factors underlying the responses of 105 subjects on the ADF. Maximum likelihood factor analysis was used to explore two-, three-, and four-factor models. Using a combination of psychometric and statistical criteria, a four- factor model was selected as the most appropriate. The factor pattern was subjected to a large number of rotations of varying obliqueness, and simple structure criterion was used to determine the terminal solution. The analysis revealed a moderately oblique four-factor structure underlying friends' scores on eight ADF scales. Two factors described by the friendship model, **friendship strength** and **tension/strain** were identified, as well as two distinct categories of interpersonal reward: **utilitarian rewards** and **self-referent rewards.** The results of the study support the relevance of the central concepts of Wright's model for these friendships and the adequacy of the ADF as an operational measure.

Lee, Gary R., & Shehan, Constance L. (1989). Social relations and the self-esteem of older persons. *Research on Aging, 11,* **427-442.**

This study employs survey data from a sample of persons 55 years of age and older to examine the antecedents of self-esteem. Hypotheses are derived from a theoretical orientation that hinges on the ability of the individual to terminate relations that might be productive of negative reflected appraisals. Consistent with hypotheses, friendship interaction is positively related to self-esteem, whereas kinship interaction is not. Marital satisfaction also affects self-esteem positively; among men, this effect is stronger for the retired than for the employed. Finally, never-married and nonemployed older women have lower self-esteem than other women have. Implications are drawn regarding the importance and role of self-esteem in theories of psychological well-being among older persons.

Lehmbruch, Gerhard. (1989). Institutional linkages and federal policy networks in the federal system of West Germany. *Publis, 19,* 221- .

West Germany's federalism looks paradoxical. It combines considerable social and cultural homogeneity with persistent institutional cleavages and a plurality of political and economic centers. Regional economic disparities are much less important than in other larger Western European countries. Traditional cleavages, such as religion, have lost much of their former salience. Uniformity of the legal framework and of standards of welfare are widely shared political goals. In this, the Federal Republic resembles the centralized nation-states of Western Europe rather than the United States, Canada, or Switzerland. However, homogeneity is not promoted by a strong centralizing force. Instead, political power and social influence are regionally dispersed. Among the rival economic and cultural centers, such as Dusseldorf, Frankfurt, Hamburg, Munich, or Stuttgart, none can claim a dominant metropolitan (hauptsadtische) role -- not to mention Bonn, which has not been able to introduce much metropolitan flair into its politico- bureaucratic monoculture. These apparent paradoxes can be understood as distinctive features of a complex network-like structure of German Federalism. It grew out of a long and intricate process of institution-building which has few parallels in other federal systems.

Leighton, Barry. (1988). The community concept in criminology: Toward a social network approach. *Journal of Research in Crime and Delinquency, 25,* **351-374.**

This article is a theoretical analysis of the concept of community in criminology. It imports a critique of the concept from urban sociology, where a guiding question has been over the decline and survival of community. A social network analytic approach is presented as an alternative model for community which captures the diversity of community types and respects its persistence as a social organizational form. The article then reviews some of the ways community has been used in criminology and offers some examples of its potential application. By freeing criminology from the traditional notion of community as a primarily local, territorially bounded phenomena, the conceptualization of community as a network of personal networks draws attention to and facilitates insights into deviance, criminality, and the criminal justice system that might not otherwise be obtained.

Leslie, Leigh A. (1989). Stress in the dual-income couple: Do social relationships help or hinder? *Journal of Social and Personal Relationships, 6,* **451-461.**

This study examines the role of social relationships in husbands' and wives' adjustment to work and family stress in the dual- income couple. The literatures on both role overload and social support were examined and found to suggest contradictory stances on the value of social support and network membership. Sixty couples in which both partners were employed provided information on their current level of work and family stress, characteristics of their significant social relationships and their overall well- being. Men and women who reported greater stressors experienced less well-being, with women focusing more on family stressors than did men. Results also indicated that the aspects of social support considered here were of little benefit in understanding adjustment in this sample, although social support did predict adjustment better for women than for men. The utility of social support theory as opposed to role overload theory in understanding the relationship among these variables in this population is discussed.

Lewis, Edith A. (1989). Role strain in African-American women: The efficacy of support networks. *Journal of Black Studies, 20,* **155-169.**

Historically, African-American women in families have been responsible for the care and nurturance of their spouses, children, and aging family members. Limited attention has been given, however, to their ability to carry out these responsibilities. Furthermore, few strategies have been suggested which may enable them to balance role responsibilities more effectively. This article reports the finds from a study investigating the use of support networks as a possible survival strategy adopted by African-American women with children.

McKee, Katharine. (1989). Microlevel strategies for supporting livelihoods, employment, and income generation of poor women in the third world: The challenge of significance. *World Development, 17,* **993-1006.**

Programs that support poor women's income earning can use four measures of effectiveness. These are: meaningful, sustainable increases in income levels for large numbers of participants; policy and regulatory changes that expand economic choices for the poor; increases in aggregate employment, economic growth, and diversification of the local economy; and "empowerment" -- evidence that women can mobilize and gain more control over their social, political, and economic lives. Using these criteria, the paper analyzes the strengths and weaknesses of three strategies for addressing the problems of self-employed individuals and microenterprise; the area-, sector-, and function-focused approaches. It concludes that the sector- and function-focused strategies offer the most promise for helping women to make significant economic gains and deserve further experimentation and donor support.

Macioti, Manfredo. (1989). Innovation and diffusion of technology: An example of the printing press. *Impact of Science on Society, 154,* **143-150.**

This article deals with the lessons we can derive about innovation and diffusion of technology from the history of the printing press with movable metal type. The invention of paper, ink and metal type, and their combination into a mechanical press for printing with movable type, constitutes one of the most important technological innovations in the history of the world. It offered mankind a new dimension of communication that made widespread literacy possible, accelerated scientific development and ultimately led to the industrial revolution. Several of the lessons that can be learnt from this revolution are still valid today and would be applicable to other paradigms of human endeavor.

Meyer, William H. (1989). Global news flows. *Comparative Political Studies, 22,* **243-264.**

This article seeks to test certain hypotheses drawn from structural communications theory, hypotheses that tend to support the call for a New World Information Order (NWIO). Structural theorists such as Johan Galtung and NWIO advocates from the Third World have charged that developing nations are dependent upon the West for international news. New dependency, in turn, is said to lead to the adoption of Western news values and subsequent cultural imperialism in the South. Finally, news dependency is said to be neocolonial in the sense that information flows through "vertical" channels (from North to South) and within district spheres of communication hegemony. These claims are tested with a news flow study drawn from African and Latin American dailies. Results of the empirical tests show that the Third World is dependent on Western agencies for the bulk of its international news, and that Third World newspapers to be more resistant to journalistic westernization, as their coverage is markedly different from that of the Western wire services. Finally, news flow patterns do exhibit a pronounced neoimperial character. Agencies from the United States, Great Britain, and France each hold sway over their own regional domains within the Third World.

Michello, Janet, & Tausig, Mark. (1988). Seeking social support. *Basic and Applied Social Psychology, 9,* **1-12.**

This study tested predictions made by social resources models about the choice of network ties for help in situations requiring social support. According to this perspective, help seekers should choose ties based on the nature of the problem (practical or emotional) and on the resource strength of different types of ties (instrumental aid or expressive aid). We distinguished the separate practical and emotional concerns represented in ten different problems and tested whether subjects choose ties based on these characteristics. Results indicate an overwhelming preference for strong ties regardless of the perceived characteristics of the problem. Moreover, prior experience and the structure of the interpersonal network affected choices. The authors conclude that social resources models that predict choice of social supporters need to be refined by differentiating the nature of specific resources possessed by strong and weak ties as well as by consideration of the complete network structure.

Mizruchi, Mark S. (1989). Similarity of political behavior among large American corporations *American Journal of Sociology, 95,* **401-424.**

Political sociologists have debated for decades without resolution about whether elites in advanced capitalist societies are integrated. Rather than ask whether elites are integrated, this study examines the conditions under which convergence of political behavior occurs, focusing on campaign contributions of political action committees in the American business community. A model of similarity in corporate political behavior is proposed that draws on principles developed by resource-dependence and social class theorists of intercorporate relations. The model was supported by an examination of the 1,596 dyads created by relations among 57 large U.S. manufacturing firms in 1980. Membership in the same primary industry or several similar industries, geographical proximity of headquarters locations (but not plant locations), market constraint, and common relations with financial institutions (through either stock ownership or directorate ties) were positively associated with the similarity of political behavior between firms. Market constraint affected the similarity of political behavior primarily because it increased the likelihood that firms would produce in the same industries. The effect of indirect board interlocking through financial institutions was a stronger predictor of similarity of political behavior than was direct interlocking between manufacturing firms. The findings suggest that simultaneous importance of organizational and social network factors in understanding common political behavior between firms.

Molm, Linda D. (1989). An experimental analysis of imbalance in punishment power. *Social Forces, 68,* **178-203.**

The restriction of power-dependence theory to reward-based power has limited knowledge of power use in exchange relations in which actors control both rewarding and aversive outcomes for one another. This study, the second in an experimental program studying exchange relations that incorporate both forms of power, investigates the effects of increasing imbalance in punishment power on (a) the use of punishment, and (b) the level and asymmetry of reward exchange, under different structures of reward power. Greater punishment power imbalance increases the use of punishment, as predicted, but not the asymmetry of punishment. Punishment power imbalance and reward power interact in their effects on reward exchange; a punishment power advantage enables an actor who is weak on reward power to increase the other's reward exchange; but it reduces reward exchange when held by an actor who is already advantaged on reward power.

Murdock, Graham, & Golding, Peter. (1989). Information poverty and political inequality: Citizenship in the age of privatized communications. *Journal of Communication 39,* 180-195.

The new market-oriented communications and information system that is currently gaining ground within liberal democracies is being sold to the general public on the promise that it will enlarge people's choices and increase their control over their lives, that it will be both liberating and empowering. This emerging order is the product of two major processes: technological innovation and convergence, and "privatisation." The first is creating a range of new kinds of communications and information services and restructuring established media industries; the second is providing the essential social and ideological context in which these changes are being developed and promoted. "Privatisation," the primary concern of this paper, operates on two main levels. Economically it involves moving the production and provision of communications and information services from the public sector to the market, both by transferring ownership of key facilities to private investors and by making success in the marketplace the major criterion for judging the performance of all communications and information organizations. This reconstitution of production is accompanied by a parallel restructuring of consumption. First, nonwork activity becomes ever more securely rooted in the home. Second, the new market-oriented system of provision addresses people predominantly through their identity as consumers, both of the communications and information products they buy and of the products promoted in the expanded advertising system that finances many of the new services.

Murphy, Christopher. (1988). Community problems, problem communities, and community policing in Toronto. *Journal of Research in Crime and Delinquency, 25,* **392-410.**

The current development of "community"-based policing as the new reform model of urban policing has been characterized by vague conceptualization and limited empirical testing. A series of propositions derived from the community policing model are examined using the findings from a recent community policing project in Toronto. The results of this analysis suggest that the community policing model needs further conceptual and empirical elaboration, despite its apparent public popularity.

Nee, Victor. (1989). A theory of market transition: From redistribution to markets in state socialism. *American Sociological Review, 54,* **663-681.**

State socialist redistributive economies are characterized by the allocation and distribution of goods through central planning. This paper develops a theory of market transition which argues that, in reforming socialist economies, the transition from redistributive to market coordination shifts sources of power and privilege to favor direct producers relative to redistributors. The shift improves incentives for direct producers, stimulates the growth of private markets, and provides to entrepreneurs an alternative path for socioeconomic mobility. A set of hypotheses test the market transition theory with household- and village- level data.

O'Reilly, Patrick. (1988). Methodological issues in social support and social network research. *Social Science Medicine, 26,* **863-873.**

With the plethora of articles describing a relationship between social support and/or social network and health status, it was considered useful to take stock of the current status of research in this area, focusing on two critical methodological issues: clarity of definition, and validity and reliability of measurement instruments. Of the 33 instruments reviewed, only modest agreement was found in conceptual definition, and frequently the concepts were not defined or ill-defined. Of particular concern is the definitional confusion between social support and social network. Variables used to operationalize these concepts confirm this lack of specificity and ambiguity in definition. As for validity and reliability, many of the investigators reported no data on these issues; others provided information that only modestly supported the validity and reliability of their instrument. The conclusions of this assessment point to the need to clarify the essential elements of social support and social networks in order to better distinguish between the behavioral (support) and structural (network) variables that may be affecting health status. A question is also raised as to the likelihood of a single questionnaire being designed that would accurately measure the perceptions of support or supportive behaviors in the variety of supportive research that will continue to be studied. Finally, more rigorous standards need to be used by investigators in establishing the validity and reliability of the instruments in order to improve their predictive utility.

Ozawa, Martha N. (1989). Distributive effects of social security and pension benefits. *Social Service Review, 63,* **335-358.**

As the public debates the danger of the increasing federal deficit, social security is once again receiving public attention. Should the government de-emphasize social security and emphasize employer-provided pensions as a vehicle for providing retirement income? Before policy makers face this question, it is important to evaluate the role of these programs in shaping the level and the distribution of income among the retired. This article presents findings from a study based on the 1982 New Beneficiary Survey. The study found that, compared with employer- provided pension benefits, social security benefits not only assure a relatively higher level of income to economically disadvantaged demographic groups of recent retirees but also are significantly more effective in equalizing income distribution among a recent cohort of retirees. Policy implications are drawn from the study's findings.

Perl, Harold I., & Trickett, Edison J. (1988). Social network formation of college freshmen: Personal and environmental determinants. *American Journal of Community Psychology, 16,* **207-223.**

A prospective approach was utilized to identify personal and environmental determinants of social networks formed by 92 college freshmen during their transition to an on-campus residential setting. Results indicate that social exploration preference (a personal coping style variable) and residence hall emphasis on exploration behavior (a social climate variable) can predict various aspects of social network structure and function, as well as other adaptive behaviors. In addition, men and women appear to develop networks with differing attributes. Similarities and differences between the results of the present study and those reported in other social network research are highlighted. A discussion of these issues underscores the necessity for taking into account specific ecological conditions when designing research into structure and function of social networks.

Pollock, Gregory B. (1989). Evolutionary stability of reciprocity in a viscous lattice. *Social Networks, 11,* **175-212.**

In randomly mixing populations, reciprocity cannot resist invasion by appropriate concurrent multiple mutants. Here I show how reciprocity can resist such invasion when the clustering ("viscous") population structure necessary for the emergence of reciprocity in a world of defection is retained after reciprocity has saturated the population. A mutation heuristic is introduced under which only forgiving reciprocity can resist Boyd/Lorberbaum invasions populations; this provides a selective basis for forgiveness and extends TIT FOR TAT's collective stability to evolutionary stability under multiple mutation. The results are generalized to n-person games, where Boyd/Lorberbaum invasion is precluded among insular commons, whether or not reciprocators are forgiving. Non-insular commons are, however, invadable, providing a selection rationale for the maintenance of in/out group distinctions under n-person social ecologies.

Powers, Beth Ann. (1988). Social networks, social support, and elderly institutionalized people. *Advances in Nursing Science, 10,* **40-58.**

This article shows how social networks studies contribute to the development of knowledge about social support and describes research on the social networks of elderly institutionalized people. Network data emerged from data obtained through an anthropological fieldwork approach to network analysis. They are discussed in connection with a conceptualization of support as esteem enhancement and coping assistance. Residents' points of view are reported in their own words as much as possible to preserve active images that confront stereotypes of elderly people as passive and dependent. Their responses illustrate important aspects of social support in institutional settings that have implications for scientific nursing practice.

Pulat, P. Simin. (1989). Maximum outflow in generalized flow networks. *European Journal of Operational Research, 43,* **65-77.**

A generalized flow network (GFN) is characterized by positive arc 'multipliers' that differ from one for some or all the arcs. GFNs have proven to be excellent models of many production, investment, and allocation problems. To date, the problem of maximizing the flow at the terminal has been treated via linear programming primal-dual arguments. An algorithm is presented that departs radically from the previous contributions in two respects: It is based on the combinatorial structure of the network, and it reverses the order of iterations by first increasing flow along paths from source to terminal, followed by increasing flow to the terminal from 'flow generating cycles'. Computer implementation of the procedure is discussed.

Ratcliff, Kathryn Strother, & Bogdan, Janet. (1988). Unemployed women: When "social support" is not supportive. *Social Problems, 35,* **54-64.**

Despite major changes in the social and occupational position of women in the last two decades, resistance to women's employment endures. This paper reports on 89 unemployed women who were personally interviewed and asked about their job orientations, the nature of support they received from others while unemployed, and their perceptions of the unemployment period. While the women reported close and extensive social support networks, the content of the messages from those networks about work was often not supportive. The nature and extent of this non-support is documented and the effect of a non-supportive social "support" network is analyzed. Our findings suggest that while some unemployed women suffer from a lack of close friends, a more common pattern may be for a woman to be surrounded by "caring others" who may undermine her by denying the legitimacy of an activity which she regards as important.

Reed, C.Y. (1989). Marriage by arrangement: A metaphor for one particular use of network therapy. *Journal of Adolescence, 12,* **279-294.**

This paper uses the metaphor of the wedding in an arranged marriage to describe the process of using a network meeting to overcome resistance and engage a hostile adolescent and her family in a residential treatment program. A review of the literature is followed by a description of the clinical case. Finally, practical and theoretical issues are discussed.

Rohrle, Bernd, & Hellmann, Ilse. (1989). Characteristics of social networks and social support among long-term and short-term unemployed teachers. *Journal of Social and Personal Relationships, 6,* **463-473.**

The impact of unemployment on social networks and social support has remained widely unknown. The cross-sectional study presented here shows that the characteristics of social networks among teachers affected by different periods of unemployment (n = 31 up to 23 months, and n = 33 from 24 to 42 months) differ only partially. No differences could be found concerning the size of social networks, the frequency of contact, and the intensity of social relationships. Unemployed teachers, however, were significantly more satisfied with their social networks and received more social support than the job holders (n = 15). Analyses of covariance made clear that neither financial distress, self-esteem, nor tendencies towards external vs. internal attribution account for these differences. These results are discussed in terms of different kinds of 'network activation'.

Ross, Hildy S., & Lollis, Susan P. (1989). A social relations analysis of toddler peer relationships. *Child Development, 60,* **1082-1091.**

We examined whether young children form different relationships with specific peers. Using the social relations model, effects of individuals as either actors or partners were distinguished from effects of relationships. Relationship effects are inferred when behavior within a dyad cannot be predicted from behavior that both partners give and receive in other social contexts. Thirty- two 20- or 30-month-old children were each paired with 2 partners (same age and gender) and observed for 18 40-minute play sessions. The social relations analysis indicated that children differed consistently in their initiation of interaction (actor effects) and in the conflict contributions they elicited from their peers (partners effects). Relationship effects were found in games and contingent interaction, and were generally reciprocal. Relationship effects emerged gradually; in contrast, neither actor nor partner effects increased over time. Results were discussed in the context of definitions of relationships and peer relationships of young children.

Rynning, M. (1989). Reciprocity in a gift-giving situation. *The Journal of Social Psychology, 129,* **769-778.**

Reciprocity in a flower-giving situation was investigated. Norwegian business students (N = 251) were randomly assigned to 12 flower-giving situations that varied by descriptive congruence of the sex of the giver relative to the receiver, affective value attached to the gift, and occasion for gift-giving. Analysis of covariance (ANCOVA) results controlled for the closeness of relationship between the giver and receiver suggest that reciprocity through flowers and reciprocity through other gifts as a continuation of earlier flower-giving are more likely when men are reciprocating rather than women and when the flowers are given as a thank-you.

Sade, Donald Stone. (1989). Sociometrics of Macaca Mulata III: N-path centrality in grooming networks. *Social Networks, 11,* **273-292.**

An individual's status is the position in a social network, which is usefully modeled by the mathematical properties of directed graphs. Katz (1953) argued that an index of status based on "who chooses whom" should also include information on the status of the choosers. This recursive concept of status was adapted by Sade (1972), who used the sum of inward directed paths as a measure of centrality to distinguish the position of individual monkeys in a grooming network. Sade et al. (1988) used the same measure to describe the progression through time of the statuses of a set of male monkeys. These studies were limited by the perceived computational difficulties in finding paths longer than 3-paths. Although ad hoc formulae for up to 6-paths were available from Ross and Harary (1952) and a general algorithm was known from Parthasarathy (1964) the methods were cumbersome and impractical to apply to large networks. The present paper makes use of simple counting algorithm to find the n-paths in a binary matrix. The characteristics of centrality statuses in the grooming network are then described using paths of up to maximum length, thus avoiding the limitations of the earlier studies.

Seltzer, Judith A., Schaeffer, Nora Cate, & Chang, Hong-wen. (1989). Family ties after divorce: The relationship between visiting and paying child support. *Journal of Marriage and the Family 51,* **1013-1032.**

Children are increasingly likely to grow up in a household with only one of their parents, usually their mother. Fathers' visits and child support payments compensate, in part, for the social and economic disadvantages children often suffer after their parents divorce. This study investigates the social and demographic determinants of the frequency of visits between noncustodial fathers and children and the amount of child support that noncustodial fathers pay. It also examines the association between visiting and paying support. Drawing on research and theory about relationships between nuclear and extended kin, we develop three interpretations of the visiting-paying association. Visits and payments (a) result from common demographic causes; (b) reflect unobserved social-psychological factors such as parents' commitment to children; and (c) are causally related to each other. We also investigate whether visits and payments are complements or substitutes. We use data from a telephone survey of a random sample of 180 divorced custodial mothers to evaluate these interpretations. Non-custodial fathers' education and living in the same state as their children increase both frequency of visits and the amount of child support paid, while the amount of time since the divorce is inversely related to the number of visits and payments. Our findings suggest that much of the association between the two outcomes can be explained by these common demographic predictors, but that visiting and paying support are also complementary activities. We consider the implications of this finding for a better understanding of noncustodial parent-child relationships after divorce.

Sered, Susan Starr. (1989). The religion of relating: Kinship and spirituality among middle eastern Jewish women in Jerusalem. *Journal of Social and Personal Relationships, 6,* **309-325.**

A participant observer study is reported. It is argued that, for elderly Jewish women in a Day Center in Jerusalem, the mundane relational realities of life are given religious significance, so that relationships become 'sacralized'. It is also shown that, for these women, religious duties are couched in relational terms. Relationships are not so much a series of discrete activities but rather the paradigm through which they interpret and organize the sacred and the profane. For these women, the aim of religious ritual is to relate the sacred to interpersonal relationships.

Sharkey, Peter. (1989). Social networks and social service workers. *British Journal of Social Work, 19,* **387-405.**

'Networks' is a word often used in the discussion of social work practice and within social service departments. It is a word which was central to the Barclay Report (1982) and important within the more recently published Griffiths Report (1988) on community care. It is a word also known to sociologists and anthropologists through the development of 'network analysis'. There is, however, a fairly wide gap between its use within social work and its use within social science. This article tries to explore this gap and the ways in which social science ideas might have some use and relevance to social service workers. It does this by using some illustrative data from a study done of the personal networks of thirty elderly people who were all clients of a social service district office.

Smith, Robert W. (1989). The Cambridge network in action: The discovery of Neptune. *ISIS, 80,* **395-422.**

In this paper, Smith argues that the place of the Cambridge network in the British scientific community is central to understanding the events surrounding Neptune's discovery. Smith scrutinizes the responses of the members of the Cambridge network to the prospect of the discovery of Neptune and the discovery itself, with Airy's place within the network as only one aspect of the account, albeit a significant one. He argues that Airy and the relatively small number of people in Britain who knew of Adams's and Le Verrier's results generally assumed that the optical, as well as the mathematical discovery, should naturally go to Cambridge, and that there was no urgent need to inform other observers. This analysis is founded in part on a large body of source material -- most notably the Herschel Papers, the Whewell Papers, and various collections in the archives of the Royal Astronomical Society -- never previously used in accounts of the discovery of Neptune. In employing this material, Smith proposes changes in the interpretation of episodes previously assumed to be settled. For example, other writers have accepted that there was only one failed search for the new planet (that by James Challis), whereas evidence indicates that there were at least three, with searches also conducted by J.R. Hind and the Paris Observatory.

Spitze, Glenna. (1988). Women's employment and family relations: A review. *Journal of Marriage and The Family, 50,* **595-618.**

Research concerning effects of women's employment on families is reviewed for the past decade. Researchers have changed an earlier assumption of negative effects on marriages and children, but they still tend to focus solely on differences by employment status rather than on consequences of various aspects of women's employment experience. They also tend to neglect minority, working-class, and single-parent families. This review begins with a discussion of effects of women's employment on the formation and dissolution of marital unions, on marital quality, and on spouse health and well being. Research on the division of housework and its relation to power and equity is treated next; then several issues relating to the interaction of husbands' and wives' jobs are reviewed. Effects on fertility and outcomes for children are considered, followed by a brief section on relations with extended family members. The review concludes with suggestions regarding future trends and research directions.

Staggenborg, Suzanne. (1989). Organizational and environmental influences on the development of the pro-choice movement. *Social Forces, 68,* **204-240.**

Social movement organizations (SMOs) play a critical role in the maintenance of a social movement. This paper focuses on the problems of how a social movement is able to maintain the participation of SMOs. Documentary and interview data on a sample of 13 single- and multi-issue pro-choice movement organizations are used to examine the development of the movement from the mid- 1960s to 1983. It is argued that environmental opportunities and threats, including countermovement expansion, aided the mobilization and expansion of the movement after legalization of abortion. Weaknesses in the single-issue movement kept multi- issue SMOs involved in the race of threat. Interorganizational linkages and preexisting organization aided ongoing mobilization. Variations in SMO participation are attributed to differences in internal structure and resources.

Stanfield, J.R. (1989). Karl Polanyi and contemporary economic thought. *Review of Social Economy, 47,* **266-279.**

This essay examines the significance of Karl Polanyi for contemporary economic thought. The key to this significance is indicated by the expression "lives and livelihood," which refers to the place of economy, or livelihood, in human society. Contemporary economic thought is dominated by a habitual outlook, formalism, which almost completely precludes consideration of the problem of lives and livelihood. This essay discusses the limitations of formalism in light of another key theme of Polanyi, the "disembedded economy." An alternative perspective, which Polanyi referred to as "substantivism," is presented, and it is argued that this perspective provides the foundation for a much needed reconstruction of economic thought.

Stephenson, Karen, and Zelen, Marvin. (1989). Rethinking centrality: Methods and examples. *Social Networks, 11,* **1-37.**

A new model of centrality is proposed for networks. The centrality measure is based on the "information" contained in all possible paths between pairs of points. The method does not require path enumeration and is not limited to the shortest paths or geodesics. We apply this measure to two examples: a network of homosexual men diagnosed with AIDS, and observations on a colony of baboons. Comparisons are made with "betweenness" and "closeness" centrality measures. The processes by which structural changes in networks occur over time are also discussed.

Symons, Donald. (1989). Comments on "distinctions among reciprocal altruism, kin selection, and cooperation and a model for the initial evolution of beneficent behavior." *Ethnology and Sociobiology, 10,* **449-451.**

For two reasons, by-product beneficence may sometimes become fixed in an unstructured population even more easily than Rothstein and Pierotti's (1988) analyses indicate. Also, contrary to their disclaimer, Rothstein and Pierotti's analyses do imply the existence of alleles specifically for beneficent behaviors.

Taylor, Verta. (1989). Social movement continuity: The women's movement in abeyance. *American Sociological Review, 54,* **761-775.**

This article uses social movement and organization theory to develop a set of concepts that help explain social movement continuity. The theory is grounded in new data on women's rights activism from 1945 to the 1960s that challenge the traditional view that the American women's movement died after the suffrage victory in 1920 and was reborn in the 1960s. This case delineates a process in social movements that allows challenging groups to continue in nonreceptive political climates through social movement abeyance structures. Five characteristics of movement abeyance structures are identified and elaborated: temporality, purposive commitment, exclusiveness, centralization, and culture.

Thus, social movement abeyance structures provide organizational and ideological bridges between different upsurges of activism by the same challenge group.

Tittle, Charles R. (1989). Influences on urbanism: A test of predictions from three perspectives. *Social Problems, 36,* **270-288.**

Predictions from the determinist compositional/systemic, and subcultural perspectives concerning effects on five "urbanism" variables -- anonymity, tolerance, alienation, community social bonds and deviant/unconventional behavior -- are tested using individual level analog measures based on data from a three-state survey. Interpretations of the results in terms of the relative strength of the three perspectives depends upon how one conceptualizes their implications. This diversity of interpretational options underlines the imprecision of each of the three perspectives. Ambiguous elements are identified and it is argued that if the three perspectives were more fully specified and synthesized, it would move us toward a genuine and more adequate theory of urbanism.

Toseland, Ronald W., Rossiter, Charles M., & Labrecque, Mark S. (1989). The effectiveness of two kinds of support groups for caregivers. *Social Service Review, 63,* **415-432.**

Adult women caring for frail older relatives were assigned to peer-led or professional-led support groups or to a control condition. Compared to control participants, groups participants experienced significantly greater improvements in their ability to cope with the stresses of caregiving. As with past research, few differences were found between participants in the peer-led and professional-led conditions.

Wellhofer, E. Spencer. (1989). The comparative method and the study of development, diffusion, and social change. *Comparative Political Studies, 22,* **315-342.**

This research investigates substantive and methodological concerns in comparative research, particularly the confounding influences of within-system developmental or causal dynamics, across-time or within-system diffusion, and across-system or spatial diffusion. The article argues that extra-system influences represent a special case of the unmeasured relevant variable problem resulting in model specification error and that proper model specification can mitigate the problem Structural equation modeling is advocated as a significant advance in such specifications. The argument is elaborated with time-series data on Argentina from 1908 to 1946 to test the developmental relationship between industrialization and political behavior.

Wills, Thomas Ashby, & Vaughan, Roger. (1989). Social support and substance use in early adolescence. *Journal of Behavioral Medicine, 12,* **321-**.**

In data from two cohorts of urban adolescents, measures of coping through support-seeking from peers and adults were related to indices of cigarette smoking and alcohol use. Peer support was positively related to substance use. Peer support had interactive relationships (positively weighted) with peer smoking and alcohol use: support had no effect when there were no friends who smoked/drinking. Adult support had a similar (negatively weighted) interactive effect in relation to peer smoking and alcohol use. Peer and adult support interacted, with an increasingly greater effect of peer support on substance use for subjects with lower levels of adult support. Interactions with gender indicated peer support more strongly related to substance use for females than males. Implications for the theory of social networks and the prevention of substance use are discussed.

Wilson, David Sloan. (1989). Levels of selection: An alternative to individualism in biology and the human sciences. *Social Networks, 11,* **257-272.**

Biology and many branches of the human sciences are dominated by an individualistic tradition that treat groups and communities as collections of organisms without themselves having the properties implicit in the word organism. In biology, the individualistic tradition achieves generality only by defining self-interest as "anything that evolves by natural selection." A more meaningful definition of self-interest shows that natural selection operates on a hierarchy of units from genetic elements to multi-species communities, and that a unit becomes organismic to the degree that natural selection operates at the level of that unit. I review levels-of-selection theory in biology and sketch a parallel argument for the human sciences.

Zemel, Eitan. (1989). Small talk and cooperation: A note on bounded rationality. *Journal of Economic Theory, 49,* **1-9.**

Neyman has shown that bounded rationality can lead to cooperation in the finitely repeated prisoner's dilemma game, if the game is conducted by finite automata of fixed size. We obtain similar results utilizing finite automata which can send messages back and forth over a given communication channel. The communication protocol utilized does not involve the transfer of any relevant information. Rather, it saturates the computational resources of the players thus preventing them from engaging in complex strategies which could potentially undermine cooperation.

Zhou, Min, & Logan, John R. (1989). Returns on human capital in ethnic enclaves: New York City's Chinatown. *American Sociological Review, 54,* **809-820.**

This study addresses a recent controversy over the character of labor markets in enclave economies: does the enclave provide positive earnings-returns to educational and other human capital characteristics to immigrant minority-group workers? We study the case of the Chinese enclave in New York City, using three distinct operational definitions of the enclave -- as a place of residence, place of work, and industrial sector. Regardless of the definition employed, there is considerable evidence of positive returns for earnings for enclave workers from education, labor market experience, and English-language ability. By contrast, none of these human capital variables is positively related to income of female enclave workers. Implications of these results for comparative research are suggested.

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