The International Network for Social Network Analysis
Le Réseau International pour l'Analyse des Réseaux Sociaux

CONNECTIONS

Volume 1   -   Number 3

Summer, 1978

CONTENTS

NETWORK NOTEBOOK

RENEW TODAY! TOMORROW MAY BE TOO LATE FOR INSNA!

This is the last issue of Volume 1 of CONNECTIONS. Unless you are one of the few people to have renewed early, your subscription to CONNECTIONS and your membership in INSNA are now at an end. (If you have renewed already, an 'R' appears on the upper right corner of the cover of this issue.

INSNA is almost completely self-supporting. If we are to print the next three issues of CONNECTIONS in '78-'79 (Volume 2), we need your money to pay the bills. We have grown in a year from 175 to 326 members. A number of solid articles are on the way in the second volume, including critical review round-ups of a number of areas. An all-new, consolidated Directory will appear in the third issue, but it will list only those members who have renewed. We do not have the staff or the funds to send out subscription renewal notices, so consider it done.

Membership is $8 (Cdn. or U.S.). The renewal form is at the back of this issue. Please FILL IT OUT NOW. WE NEED YOUR MONEY!

PERIPATETIC EDITOR

Barry Wellman, INSNA Coordinator, will be a Fellow at the Netherlands Institute of Advanced Studies; Meyboomlaan, 1; Wassenaar, The Netherlands (from August, 1978 through July, 1979). While Editorial Offices (and our steadfast Associate Editor) will remain in Toronto, editorial mail may be sent to Wassenaar as well. Although this may cause some delays and confusions, we hope that the added scope for trans-Atlantic connectivity will more than compensate for inconveniences.

CONNECTIONS/INSNA and SOCIAL NETWORKS/ELSEVIER: Clearing up Confusions.

Mail that should have gone to Toronto for INSNA has been sent to Elsevier in Lausanne by mistake, and vice-versa. The correct destinations are listed on page 3 where NETWORK NOTEBOOK continues.

...Network Notebook, cont'd.

All correspondence and subscription remittances with regard to INSNA and CONNECTIONS should be sent to Toronto. (Barry Wellman, Editor/Coordinator, INSNA, Centre...etc.)

Subscription remittances for individuals to SOCIAL NETWORKS may also be sent to Toronto. All requests for a free sample should be sent directly to Elsevier in Lausanne (PO Box 851; 1001 Lausanne 1, Switzerland). All institutional subscriptions to SOCIAL NETWORKS go to Elsevier. All editorial correspondence re SOCIAL NETWORKS should be sent to the Editor, Linton Freeman, or the Associate Editors, J. Clyde Mitchell and Rolf Zeigler.

INSNA has no paid staff. We put out CONNECTIONS in our spare time and we enjoy doing so. However, we are also busy writing books, dissertations, etc., and just do not have the time to sort out misdirected requests. Thus while we enjoy reading the lengthy letters that some folks write, please be understanding if we fail to answer at equal length. Better still, if you would take a little time to put the letter in a formal format, we might then use it as a brief Research Report or in Network Notebook. And please be understanding when an issue is delayed.

SOCIAL NETWORKS is Coming Soon: First Issue in August.

The first issue of SOCIAL NETWORKS is at the publisher's. It will contain:
Ithiel de Sola Pool and Manfred Kochen, "Contacts and Influence."
Alvin Wolfe, "The Rise of Network Thinking in Anthropology."
Stephen B. Seidman and Brian Foster, "A Note on the Potential for Genuine Cross-Fertilization
    Between Anthropology and Mathematics."
Lee Sailer, "Structural Equivalence: Meaning and Definition, Computation and Application."
Ove Frank, "Sampling and Estimation in Large Social Networks."

Volume 1, Number 2, will include papers by Ronald Burt and by Peter Killworth and Russell Bernard. (A comment by Howard Andrews on a preliminary version of the Killworth/Bernard paper appears in this issue of CONNECTIONS.)

It is not too late to order. A subscription blank for SOCIAL NETWORKS is at the back of this issue.

WE'RE SOLICITING

CONNECTIONS would very much like to publish research reports, reviews of network research in specific disciplines or substantive issues (a good critique of network therapy is especially desired right now), computer programs, course outlines, news announcements, thesis summaries, abstracts, poems, limericks and puzzles. We reserve the right, of course, to referee and reject anything that is submitted. Please submit all material to our Toronto address or, until July, 1979 to the Wassenaar address.

MONEY FOR NETWORK ANALYSIS FROM THE U.S. NATIONAL INSTITUTE OF EDUCATION

N.I.E. has been flooding networkers, from all reports, with a Request for Proposal for "Research on Social Networks in Education." The formal Request was issued May 23, 1978 and the due date for replies is July 12, 1978. To quote from the Request:

> "You are invited to submit a Proposal in accordance with the requirements of Request for Proposals No. NIE-R-78-0016. This Request for Proposals will result in multiple awards for the conduct of research on The Role of Social Networks in Education. Between four and six initial awards will be made, each for a period of up to three years, with a typical level of effort of approximately one person - year per contract year..... The purpose of this research is to increase knowledge about the characteristics, dynamics, and effects of Social Networks in Education, which serve as links among individuals and organizations.

> This RFP seeks research which will advance knowledge about the Role of Social Networks in Education among individuals and organizations. The projects should decribe and interpret the Role of Social Networks in Education; researchers will also be asked to reflect on the implications of their research for educational policy-making and practice..."

For a copy of the Request, write to John Ourand, Contracting Officer, Contracts and Grants Management Division, National Institute of Education, 2 M Street, N.W., Washington, D.C. 20208.

There is no indication that the Request is limited to U.S. researchers.

...Network Notebook, cont'd.

ELITES MEET AT THE ASA

Peter Mariolis is planning to host an informal meeting of those doing network analyses of elites during the American Sociological Association annual meetings, San Francisco Hilton, Wednesday, September 6th, at 8:30 PM.

AND THE REST AT THE ISA

Whoever makes it up to the ISA in Uppsala, August 14-19, is cordially invited to attend seven sessions devoted to Network Analysis (we're Ad Hoc Group 21). The schedule is elsewhere in this News-letter. In addition, there will be an informal organizational meeting and social to discuss future directions for INSNA. See you there.

THE INSNA 10cm BOOK SHELF

"What should a networker take to the beach for summer reading?" We've been asked that question from time to time. Herewith are some suggestions. Additional suggestions from members are earnestly solicited:

Joseph Heller, Catch-22. "M & M Enterprises" was one of the models for INSNA.

Joseph Heller, Something Happened. The first chapter is a delightful account of intra-organizational networks.

Ursula K. LeGuin, The Dispossessed. The "K" means she is Kroeber's daughter. A science-fiction portrayal of an anarchist world, arguing that strong, densely knit networks and heavy internalized norms are needed to make an anarchist society work in the absence of coercive state structures. Much more fun than we've made it sound.

Ursula K. LeGuin, The Left Handed of Darkness. Sociobiology meets network analysis: the structural and cosmological implications of a single-sexed world. Science-fiction.

Alfred McCoy, The Politics of the Heroin Trade in Southeast Asia. A masterpiece of macroscopic network analysis. Purportedly non-fiction.

SOME 'THANK YOUS' FROM THE EDITOR

TO: Barry Crump (Associate Editor and Associate Coordinator), who has competently handled all of the fussy details and many of the policy decisions of this, our inaugural year;

Peter Carrington (Associate Coordinator), who has taken charge of maintaining our computerized Directory and membership files, using a program that he custom-wrote, to Peter and Trudy Johnson-Lenz who did our original Directory, and to June Corman who did our first membership mailing.

Larry S. Bourne (Director of the Centre for Urban and Community Studies) and Lorna Marsden (Chair of the Department of Sociology, University of Toronto) for providing lots of tangible and intangible support;

Colleen Leighton and Mildred Leighton for typing this issue; Versatel, our printer, who has suffered amateurs with patience.

Karen Anderson, Hazel Bartolo, Stephen Berkowitz, Michal Bodemann, June Corman, Barry Edginton, Bonnie Erickson, Betty Lam, Edward Lee, Christina Marmoreo, Karen Moeller, Livianna Mostacci, Margaret Redford, Lorne Tepperman, and Beverley Thompson for proofreading, stuffing envelopes, sticking labels and helping out lots.

An a special thanks in this for Joel Levine and Nicholas Mullins, Howard Andrews, William Ratcliffe and Simon Langlois who typed 'camera-ready' copy for our offset printer. (On the other hand, don't blame us for their typos.)

ORGANIZATIONS AND PUBLICATIONS

Linkage #3, published by the Institute for Operational Research, will have a review article on the use of network analysis in public administration (free; see CONNECTIONS 1(2): 65, for address).

THE ASSOCIATION OF VOLUNTARY ACTION SCHOLARS is "a professional and scholarly association for all those who are concerned with better understanding of citizen involvement and volunteer participation." It includes both scholars interested in voluntary action research and participants in voluntary, non-profit organizations and programs - "the whole range of noncoerced human behavior which is not directly remunerated." Specific interests include: volunteer programs, voluntary associations, social movements, citizen participation, altruism, helping behavior, philanthropy, leisure, religious activity, cause groups and political participation." AVAS puts out a number of publications, including a quarterly scholarly journal, a quarterly Abstracts publication, a Newsletter and a quarterly journal devoted to Volunteer Administration. Their annual meeting is scheduled for Toronto this Fall; at least one session will be devoted to networks. Dues (including publications) $18., students $10. Write: AVAS, 1919 14th Street, Suite 619, Colorado Building, Boulder, Colorado 80302, U.S.A.

MEETING CALENDAR

INTERNATIONAL CONFERENCE ON MATHEMATICAL APPROACHES TO THE STUDY OF SOCIAL POWER
Bad Homburg, West Germany; March 9 - 11, 1978.

PRELIMINARY PROGRAM:

James Coleman (Sociology, Chicago) "The Corporate Structure of the Economy and Contributions to Income Inequality"
S.D. Berkowitz (Sociology, Toronto) "Economic Structure and Market Power in Canada"
F.N. Stokman (Groningen) "Interlocking Directorates Among Large Corporations in the Netherlands in 1972"
Robert Mokken (Political Science, Amsterdam) "Corporate Governmental Networks in the Netherlands"
Edward Laumann (Sociology, Chicago) "Collective Actors and Community Issue Resolution"
Gudmund Hernes (Sociology, Bergen) "The Open Input-Output-Model, Collective Decisions, and Policy Analysis"

SECOND INTERNATIONAL CONFERENCE ON COMBINATORIAL MATHEMATICS
New York, New York, U.S.A.; April 4 - 7, 1978.

(Selected Papers Listed Only):

Michael Doob (University of Manitoba) "Graphs with a Small Number of Distinct Eigenvalues II"
Melvyn B. Nathanson (Harvard University) "On Additive h-Bases for Lattice Points"
Frank Harary (University of Michigan) "A Class of Extremal Graph Problems"
Michael F. Capobianco (St. John's University) "Graph Equations"
John C. Molluzzo (St. John's University) "Toughness, Hamiltonian-Connectedness, and N-Hamiltonicity"
Pavol Hell (with D.J. Miller), (Rutgers University) "Graphs with Forbidden Homomorphic Images"
Louis B. Billera (with J.S. Provan), (Cornell University) "A Decomposition Property of Simplicial Complexes and its Relation to Diameters and Shellings"
Fred Buckley (Graduate Center, CUNY) "On Ramsey Functions Relating to the Formation of Complete Graphs"
Judith Q. Longyear (Wayne State University) "Determining the Number of Transpose Inequivalent Hadamard Matrices of Order 24"
Norman L. Biggs (Royal Holloway College, University of London) "Some Odd Graph Theory"
Willibald Dörfler (Universitat fur Bildungswissenschaften, Klagenfurt) "Multiple Covers of Hypergraphs"
Izak Z. Bouwer (University of New Brunswick) "On the Extremal Symmetry of Hypergraphs"
Martin Charles Golumbic (Courant Institute of Mathematical Sciences, New York University) "A Generaliation of a Theorem of Dirac on Triangulated Graphs"
Ruth A. Bari (George Washington University) "Some Recent Results on Chromatically Equivalent Graphs"
Jaroslav Nesetril (Charles University, Prague) "Categorical Means for Constructions of Difficult Graphs"
Steven B. Maurer (with P.J. Slater), (Princeton University) "Minimally 2-Edge-Connected Graphs"
Donald J. McCarthy (St. John's University) "Extremal Problems for Graphs with Dihedral Automorphism Group"
J.C. Bermond (Laboratoire de Recherche en Informatique, Universite de Paris-Sud) "k-Connected Oriented Graphs"
Gary S. Bloom (California State University, Fullerton, Fullerton, California and City College,CUNY) "Collecting Auto-Graphs or When Can n (Unordered) Integers Specify an n-Node Graph?
Haim Hanani (Technion, Israel Institute of Technology, Haifa) "Decomposition of Hypergraphs into Octohedra"
William T. Tutte (University of Waterloo) "On the Spanning Trees of Self-Dual Maps"
Daniel H. Younger (University of Waterloo) "From Shortest Paths to Minimum Directed Cut Transversals"
Allen J. Schwenk (U.S. Naval Academy) "The Construction of Cospectral Composite Graphs"
M. Deza (with L. Babai), (CNRS, Universite Paris VII) "Approximation of PG(2,n) by Sharply Edge-Transitive Digraphs"
Alan C. Tucker (SUNY,Stony Brook) "On Berge's Strong Perfect Graph Conjecture"
Albert W. Tucker (Princeton University) "Sperner's Lemma and Another Combinatorial Lemma"
Thomas W. Tucker (with J.L. Gross), (Colgate University) "Local Maxima in Graded Graphs of Imbeddings"
Masao Iri (University of Tokyo) "Principal Partitions of Matroids and Their Applications: A Review of Recent Activities in Japan"
Ronald L. Graham (with F.R.K. Chung), (Bell Laboratories, Murray Hill, New Jersey) "On Universal Graphs"
Louis Weinberg (with T. Inukai), (City College, CUNY) "Graph-Realizability of Matroids"

Brian R. Alspach (Simon Fraser University) "Isomorphisms of Circulant Graphs"
Daniel J. Kleitman (with S. Chaiken and R. Li), (Massachusetts Institute of Technology) "Degree Sequences
    of Strongly Connected Graphs"
Lowell W. Beineke (with E.F. Schmeichel), (Purdue University) " On Degrees and Cycles in Graphs"
Roberto W. Frucht (Universidad Tecnica F. Santa Maria, Valparaiso, Chile) "The Graceful Numbering of
    Wheels and Related Graphs"

*FIRST WORLD CONGRESS OF NETWORK ANALYSIS / integrated with AD HOC GROUP 21 OF THE NINTH WORLD CONGRESS OF
SOCIOLOGY ("ADVANCES IN NETWORK ANALYSIS")
University of Uppsala, Sweden; August 14 - 18, 1978.*

*(Note: All program listings, places and times are tentative; check World Congress of Sociology program
upon arrival.)*

Co-Organizers: Bengt Rundblad (Sociology, Goteborg) and Barry Wellman (Sociology, Toronto).

THEORY AND METHODS I - Tuesday, August 15, 8:30 - 11:00 PM, HSC Building.
Organizer and Presider: Linton C. Freeman

Ronald S. Burt (Sociology, University of California, Berkeley) "Cooptive Interlocking Corporate Dir-
    ectors and Profits in Manufacturing Industries"
Mark Maletz (Sociology, Dartmouth College) "Corporate Linkages Through Voting Rights"
Narciso Pizarro (Sociology, University of Quebec in Montreal) "Places and Networks of Places: A Homo-
    geneous Space for the Definition of Social Structure"

THEORY AND METHODS II - Wednesday, August 16, 10:00 - 12:00 AM, Etnologi, saskilt utomeuropeisk
building (Kungsängatan 19).
Organizer and Presider: Linton C. Freeman

Patrick Doreian (Sociology, University of Pittsburgh) "Activity, Hierarchy and Sentiment in Small Groups"
Linton C. Freeman (Social Relations, Lehigh University) "Point Centrality and Small Group Decision-
    Making"
James R. Lincoln and Jon Miller (Sociology, University of Southern California) "Organizations as Net-
    works: Authority Relations and Social Distance in Organizational Settings"

THEORY AND METHODS III - Wednesday, August 16, 2:00 - 4:00 PM, Etnologi building, Kungsängatan 19.
Organizer and Presider: Linton C. Freeman

Sue Freeman (Social Relations, Lehigh University) and Douglas White (Anthropology, University of
    California, Irvine) "Scientific Communication on an Electronic Medium"
Lee Sailer (Anthropology, University of California, Irvine) "Roles and Network Relations"
Barry Wellman (Sociology, University of Toronto) "The Community Question"
Alden Klovdahl (Australian National University) "Networks in Society: The Random Walk Strategy"

KINSHIP STRUCTURE, HOUSEHOLD ORGANISATION AND THE STATE, PART I - Wednesday, August 16, 8:30 - 11:00 PM,
HSC Building.
Organizer and Presider: Y. Michael Bodemann

Karen Anderson (Sociology, McMaster University) "Relations of Production and the Kinship Structure: A
    Study of 17th Century Huron Indians"
Natalia Damian (University of Bucharest) "Influences of Industrialisation and Urbanisation on the
    Rumanian Urban Family: Task Divisions and Changing Authority Relationships Between Husband and
    Wife"
Mubeccel B. Kiray (Technical University, Istanbul) "Income and Consumption Patterns of Families in a
    Small Turkish Town"
Barbara Laslett (Sociology, University of Southern California) "Household Structure and the Social
    Organisation of Production: Los Angeles, California in 1850"

KINSHIP STRUCTURE, HOUSEHOLD ORGANISATION AND THE STATE, PART II - Thursday, August 17, 9:30 - 12:00 AM,
Etnologi building, Kungsängatan 19.
Organizer and Presider: Y. Michael Bodemann

Peter Aaby (University of Copenhagen) "Towards the Brave New World: A Comment on Marxist Analyses of
    Kinship and Biological Reproduction in Primitive Societies"
Wanda Minge-Kalman (Harvard University) "A Theory of the European Household Economy During the Peasant
    to Worker Transition: With an Empirical Test from a Swiss Alpine Village"
Elias Sevilla-Casas (Universidad de Los Andes, Bogota) "The Role of Kinship Networks in the Structure
    and Functioning of the Cabildo (Indian Council) in Southwestern Colombia"
Louise A. Tilly (History, University of Michigan) "The Family Wage Economy of a French Textile City,
    Roubaix, 1872-1906"

INSNA ORGANIZATIONAL MEETING - Thursday, August 17, 2:00 - 3:00 PM, Etnologi building, Kungsängatan 19.

INTER-ORGANIZATIONAL LINKAGES I - Thursday, August 17, 8:30 - 11:00 PM.

Session Cancelled. Disregard ISA program.

INTER-ORGANIZATIONAL LINKAGES II - Friday, August 18, 10:00 - 12:00 AM.

Session Cancelled. Disregard ISA program.

ANNUAL MEETINGS OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION
Toronto, Ontario, Canada; August 28 - September 1, 1978.

SOCIAL SUPPORT NETWORKS AND SOCIALLY INDIGENOUS HELPERS
Co-Organizers and Presiders: Richard Young and Ronald Curry (Psychological Clinic, Indiana University)

The symposium will deal with what might be called, with a dash of drama, the true community psychology - that is, the manner in which people use other people and social groups for the relief of problems in living in the absence of professional intervention. Papers will deal with conceptual approaches to the area, empirical studies of natural helpers, and the integration of socially indigenous help in community mental health delivery systems.

PARTICIPANTS AND PRESENTATIONS:
Ronald Curry and Richard D. Young "Socially Indigenous Help: The Community Cares for Itself"
Shirley L. Patterson "Natural Helping Approaches: Implications for Humanizing Professional Practice"
Diane L. Pancoast "A Method of Assisting Natural Helping Networks"
Steven J. Danish "Designing and Implementing a Community Self-Help Training Program"
Kenneth Heller and Thomas M. Amaral "Experimental Study of Social Support: An Approach to Understanding
    the Indigenous Helper"

Discussant: Leon H. Levy

The underlying goal of the symposium is to bring together for the first time many professionals interested in the investigation of socially indigenous help. Hence we wish to attract the attention of researchers and practitioners so that they may identify themselves and join in the exchange of ideas - which brings us to the point of this letter.

Time (three to five minutes) will be made available for audience members to describe their own interests and research in the field. Following the formal presentations we intend to open the floor to audience members who have previously contacted us about making such brief presentations. After the conclusion of the audience presentations we will throw open the floor.

ANNUAL MEETINGS OF THE AMERICAN SOCIOLOGICAL ASSOCIATION
San Franscisco, California, U.S.A.; September 4 - 8, 1978.

SOCIAL NETWORKS - Thursday, September 7, 4:30 PM.
Organizer: Barry Wellman
Presider and Discussant: Nicholas Mullins

Ronald S. Burt (University of California) "Autonomy in a Social Topology: An Analysis of the Structural Determinants of Profits for Manufacturing Industries in the 1967 American Economy"
Peter Harris (Yale University) "Measuring Change in the Homogeneity of a Citation Network"
Starr Roxanne Hiltz (Upsala College and New Jersey Institute of Technology) "Electronic Networks: The Social Dynamics of a New Communications Medium"
Peggy Wireman (U.S. Department of Housing and Urban Development) "Intimate Secondary Relations"

METHODOLOGY: DATA BASES: PROBLEMS OF DESIGN, IMPLEMENTATION, AND USE - Tuesday, September 5, 2:30 PM.
Organizer: S.D. Berkowitz
Presider: Rob Kling
Discussant: David Knoke

Ernest Change (University of Waterloo) "The Use of Distributed Data Bases for Medical Information Systems."
Rob Kling (University of California, Irvine) "The Social Dynamics of Instrumental Data Base Use."
S.D. Berkowitz, Peter Carrington and June Corman (University of Toronto) "A Flexible Design for a Corporate Information Data Base."
Joel H. Levine (Dartmouth College) "The BARON Corporate Information Data Archive."

SUB-SYSTEMS: INTER-ORGANIZATIONAL NETWORKS - Wednesday, September 6, 4:30 PM.
Organizer and Presider: Howard E. Aldrich
Discussant: Karen S. Cook

David Knoke (Indiana University) and David L. Rogers (Iowa State University) "A Block Model Analysis of
    Interorganizational Networks."
Joseph Galaskiewicz (University of Minnesota) "Hierarchical Patterns in a Community Interorganizational
    System."
Wolfgang Bick and Paul J. Mueller (University of Cologne) "Stable Patterns Within a Network of Urban
    Bureaucracies: Domains or Positions?"
Charles L. Mulford and Mary Ann Mulford (Iowa State University) "Correlates of Interdependence Between
    Voluntary Organizations."
Johannes M. Pennings (Carnegie-Mellon University) "Interorganizational Relationships: The Case of
    Interlocking Directorates."

THEMATIC PANEL: SOCIETAL GROWTH: THE LOCALITY GROUP IN AN EXPANDING SYSTEM (Transportation improve-
ments, the widening universe of choice, neighborhood survival) - Thursday, September 7, 12:30 PM.

Presider: John D. Kasarda
Discussants: Sylvia F. Fava, Robert Gutman, Albert Hunter

Morris Janowitz (University of Chicago)
Gerald Suttles (University of Chicago)

...*NETWORK NOTEBOOK Continued from page 4.*

    The NATIONAL SELF-HELP RESOURCE CENTER is devoted to fostering U.S. Community Resource Centers and connections between them. They publish a Newsletter ("Network Notes"), give book discounts, and provide services to Centers. Write The National Self-Help Resource Center, Community Resource Centers Network, 2000 "S" Street, N.W., Washington, D.C. 20009.

THREE BIBLIOGRAPHIES NOW AVAILABLE

1.   *Alden Klovdahl (Department of Sociology, Arts, Australian National University) Social Networks: Selected References for Course Design and Research Planning. (Preliminary Draft, 70+ pp., available on request.)*

2.   *Patrick Joseph Meehan (School of Architecture and Urban Planning, University of Wisconsin) Social Network Analysis: A Man/Environment Approach to Urban Design and Planning. Council of Planning Librarians Exchange Bibliography No. 1504, April, 1978 (P.O. Box 229, Monticello, Illinois, 61856; $2.00). This is a 16pp. annotated bibliography, concentrating on recent publications in the urban studies literature.*

3.   *Paula C. Barker and Elinor Ostrom (Department of Political Science, Indiana University) Community Organization and Neighborhood Government: A Preliminary Bibliography. In addition, Supplement #1 by Frances Pennell Bish is available Write Elinor Ostrom.*

SOME DEFINITIONS

    "Network: Any thing reticulated or decussated, at equal distances, with interstices between the intersections." "Reticulated: Made of network; formed with interstital vacuities." "To Decussate: to intersect at acute angles." (From Samuel Johnson, Dictionary. London: 1755). Our thanks to W.W. Watt for this item.

    "Like the fish net, a Network is set up to catch specific things. Fish with titles like information resources, skills, needs. When these fish are caught in the net, they are passed along the lines connecting members along the net's lines, done visually in a workship." (John Briggs, National Self-Help Resource Center, suggests the above as a way of explaining networks to the average citizen in community centres.)

    The following definitions were compiled by Anne Dosher in an article titled, "Networking: The Vision" (publication information not known):
    Pierre Teilhard de Chardin, The Prayer of the Universe. "My starting point is the fundamental initial fact that each one of us is perforce linked by all the material, organic, and psychic strands of his being to all that surrounds him. Not only is he caught up in a network, he is carried along, too, by a stream. All around us, in whatever direction we look, there are both links and currents. We are all interconnected elements of one and the same curve that extends ahead of and reaches back behind us."

SPECIAL JOURNAL ISSUES

CONTENTS FOR A SPECIAL ISSUE OF SOCIOLOGICAL METHODS & RESEARCH ON APPLIED NETWORK ANALYSIS
This Issue is Scheduled for November, 1978.

(Note: Some of these Titles may change in the final issue. Copies will be available from the publisher,
Sage Publications, 275 South Beverly Drive, Beverly Hills, CA 90212.)

Ronald S. Burt (University of California, Berkeley) "Applied Network Analysis: An Overview." (see below)
L.M. Jones and Claude S. Fischer (University of California, Berkeley) "A Procedure for Surveying Per-
    sonal Network."
Nan Lin (State University of New York, Albany) and P.W. Dayton and P. Greenwald (New York State Depar-
    ment of Health) "The Instrumental Uses of Social Relations."
Richard D. Alba and Gwen Moore (Cornell University) "Elite Social Circles."
Ronald S. Burt (University of California, Berkeley) "Cohesion Versus Structural Equivalence as a Basis
    for Network Subgroups."
Ronald L. Breiger (Harvard University) and P.E. Pattison (Australian National University) "The Role of
    a Community Elite."
Paul W. Holland (Educational Testing Service) and Samuel Leinhardt (Carnegie-Mellon University) "An
    Omnibus Test of Social Structure Using Triads."
Terry N. Clark (University of Chicago) and Joseph Galaskiewicz (University of Minnesota) "Community
    Characteristics and Leadership Structure in American Cities."

BURT, Ronald S. "Applied Network Analysis: An Overview."
(First paper from issue)

There seems to be agreement among those working in the area that network analysis consists of anal-
yzing the linkages among actors (actors being persons, groups or corporations) as opposed to analyzing
attributes of the actors as individuals. As such, network analysis provides a means for capturing in
substantive, empirical research classic social concepts such as the status / role-set duality, primary
and secondary group affiliations, reference groups, prestige, power, stratification, et cetera. Un-
fortunately, there is currently a disconcerting separation between theoretical treatments of network
structure and the substantive use of network concepts. This condition could change in the future. It
currently is contradicted by occasional network analysts. My suspicion, however, is that the division
of labor between mathematical theorists and substantive researchers is likely to deepen rather than dis-
appear. I therefore believe that there is need for developing what could be termed "applied network
analysis" - methodology for applying abstract models of network structure in substantive, empirical re-
search. This collection of papers is directed toward that need.

Manuscripts have been solicited for this collection so as to represent six modes of network anal-
ysis currently popular in the social sciences. The collection will hopefully expose the range of prac-
tical issues relevant to applied network analysis. The six modes of network analysis are distinguished
by two parameters; (1) the level of aggregation of actors - individuals versus subgroups within a sys-
tem versus whole systems, and (2) the approach taken to linkages between actors - the relational
approach versus the positional approach. The relational approach is typified by traditional sociometry
in its focus on the relations between actors. Subgroups within this approach are "cliques." Actors
are aggregated into a clique to the extent that the actors are connected to one another by intense rel-
ations. The positional approach focuses on the pattern of relations in which an actor is involved.
All an actor's relations to and from other actors in a system defines the actor's position in the sys-
tem. In terms of academic tradition, the positional approach is associated with social stratification;
positions operationalizing statuses and role-sets. Subgroups within this approach are "statuses" or
"jointly occupied positions." Actors are combined into a single position to the extent that they have
identical patterns of relations with other actors in a system. Such actors are "structurally equivalent"
to one another (Lorrain and White, 1971).

The relational approach to network analysis at an individual level can be termed the study of
"personal" networks. This mode of analysis is predominantly pursued by anthropologists (Mitchell, 1969,
1974; Boissevain, 1974) as well as some sociologists (Fischer et al. 1977; Wellman, 1977). The analysis
here consists of asking an individual to describe his relations to others and the individuals with whom
he has different types of relations. Note that relations here are treated in the same manner as actor
attributes in traditional mass surveys so that established sampling techniques can be used to generate
large sample sizes representative of whole communities, regions or nations. In the first paper of the
collection here, Jones and Fischer discuss their use of traditional mass survey techniques in order to
gather data on the personal networks of persons representative of the population in Northern California.

The positional approach to network analysis at an individual level differs from the relational approach in that instead of basing the analysis on a random sample of egos reporting relations, the analysis considers all relations from ego and to ego within a system of actors. There are two directions of work here. One line of work concerns the construction of indices that capture aspects of the pattern of relations defining an actor's position. For example, Freeman (1977) provides a useful review of different measures of the "centrality" of an actor within a system. Actors are central to the extent that they are involved in strong relations with all actors in a system. Bonacich (1972) provides a synthesis of earlier efforts to measure the "prominence" of an actor within a system. Actors are prominent to the extent that they are the object of strong relations from prominent actors. A second line of work concerns the analysis of personal networks in the context of the position ego occupies in a social structure. The most commonly used social structure here is the occupational structure. The personal networks of actors are compared across different occupational statuses. For example, Laumann (1966) studied the tendencies for men to have friendship relations with men in their own occupational status versus those in higher or lower prestige occupational statuses. In the second paper of this collection, Lin et al. discuss their use of the small world technique to study the manner in which individuals in a status use existing relations to reach strangers occupying the same as well as different statuses.

The relational approach to analyzing subgroups within a system consists of locating and comparing "cliques" as sets of actors among whom there is dense interaction. The problem of clique detection has received - and continues to receive - considerable attention from social scientists. In the United States, Columbia University has long been a center for the analysis of cliques and social circles through work at the Bureau of Applied Social REsearch resulting in recent years in studies of political and intellectural elites (e.g., Barton et al., 1973; Kadushin, 1974). Central in this recent work has been Richard Alba's work translating graph theoretic concepts into practical guides for substantive research. The paper by Alba and Moore in this collection discusses some of the issues involved in detecting cliques and social circles among American intellectual elites.

The positional approach to analyzing subgroups within a system is a relatively recent development consisting of locating and comparing jointly occupied positions as sets of structurally equivalent actors. Actors in a set are structurally equivalent to the extent that they have identical patterns of relations with all actors in a system. To the extent that two actors have different relations with other actors in a system, then the two actors are separated by high "distance" within the system. This positional approach is currently represented by work that measures distance on a nominal scale - two actors are equivalent or they are not - to construct a "blockmodel" of social structure (White et al., 1976; Breiger, 1976) and by work that measures distance on a continuous scale - two actors have a quantifiable level of equivalence - to construct a "social topology" of social structure (Burt, 1976, 1977a, 1977b, 1978). My own paper in this collection compares the relational and positional approaches to locate subgroups among elite experts in methodological and mathematical sociology in order to highlight parameters for deciding whether to use "cliques" or "positions" as subgroups in a particular analysis.

Further aggregating actors, the analysis of network structure at a system level has two components. First, types of system structures need to be determined. For example, hierarchical structures could be distinguished from pluralistic structures. Following this classificatory work, the etiology and consequences of different types of system structures are analyzed. This second line of work has been discussed often in sociology as contextual analysis. Actors are analyzed in the context of the structure of the system in which they act (cf. Blau, 1960).

The positional approach to analyzing overall system structure focuses on the relations among positions in the system. Harrison White has made Harvard University a center for schemes classifying social structures into types. White (1963) provides an early effort in this genre by developing Weil's insights into Levi-Strauss' work on kinship exchange. In the context of bold assumptions, White is able to develop a scheme for classifying kinship structures of exchange into types of structures where structures within a type are homomorphisms of one another, i.e., are derivable from one another or from a common ideal type structure. This line of work has been continued with reference to more general network structures in Boorman and White (1976). In a considerably more empirical vein, Burt (1975) estimates topological representations of social structure among types of corporate actors and persons in the United States over the last century and finds three types of structures that occur repeatedly at separate points in time with the occurrence of specific social and economic conditions in the country. In an effort to provide a framework for generalizing empirical case studies of community power structures, Breiger (1978) reviews available studies so as to discern types of blockmodels of elite structures. In this collection, Breiger and Pattison discuss some of the practical problems involved in selecting a proper blockmodel representation for the network structure among elites in the community Laumann and Pappi (1976) named "Altneustadt."

The relational approach to overall system structure focuses on relations between actors and groups. For example, there is a growing literature on the analysis of overlapping group memberships as a means of characterizing system structure (Bonacich, 1977) particularly in systems of organizations (e.g. Levine, 1972). Building on Heider's (1958) concept of structural balance, systems can be classified

according to the frequency with which each of sixteen types of triad structures occurs. If the structures of relations among all triads in a system is "balanced" then some types of triad structures should occur frequently and others should not occur at all (Cartwright and Harary, 1958; Davis, 1967; Hallinan, 1974). Central in this work has been the efforts by Paul Holland and Samuel Leinhardt (1970, 1975) to provide statistical tests for the frequency with which each of the sixteen possible types of triads occurs. Their contribution to this collection proposes a global measure of the extent to which there is any network structure at the triadic level beyond random chance. Unfortunately, the structure of group memberships and triads in a system have been used less often in substantive work comparing different systems than have far less sophisticated indices of related network features such as density, connectivity, centralization or hierarchization (e.g., Coleman, 1964; Barnes, 1972). In particular there has been considerable work comparing communities in which cliques or groups of actors are interconnected to different extents (cf. review by Turk, 1977: 97-132). The University of Chicago has long been a center for such studies and Terry Clark is continuing that work with his studies of community structure and decision-making. The Clark and Galaskiewicz contribution to this collection discussed some recent work linking community characteristics to leadership structures in American Communities.

Although I am pleased with this collection of papers given the space limitations imposed by Sage, my effort to cover the range of different modes of network analysis has resulted in a failure to cover two basic issues common to all modes. There is no systematic discussion here of how relations can be operationalized. Most of the authors are using sociometric citations as a basis for relations as seems to be the general preference (see discussion and references in Holland and Leinhardt, 1973). However, there are alternative transformations for operationalizing relations using sociometric citations and where citation data is impractical either because there are too many actors being considered or such data is unavailable, then compromises are required (cf. Aiken and Mott, 1970:193-404; Burt and Lin, 1977). An important topic for applied network analysis is the study of how different relational operationalizations affect inferences within different modes of network analysis. Also lacking in this collection is a discussion of how systems are to be operationalized. Where does a system stop? The most popular operationalization appears to be a combination of positional and snowball sampling. Central actors in a system are located according to their prominent positions. These actors then cite other actors who are also important in the system. Through multiple waves of citations, the sample "snowballs" into the final system. Coleman's (1958) early discussion of sampling for relational analysis still merits attention and the works in Aiken and Mott (1970) compare methods used by community researchers to determine the system of elites within a community. Since none of the modes of network analysis are inherently robust over changes in system operationalization, another important topic for applied network analysis is the study of how different system operationalizations affect inferences within the separate modes of analysis.

The purpose of this collection then is not to introduce new models of network structure (e.g., Leinhardt, 1977b), nor to introduce new substantive applications of network concepts (e.g., Mitchell, 1969; Boissevain and Mitchell, 1973), nor to gather together early work leading to the current state of network analysis (e.g. Leinhardt, 1977a). Rather, the purpose here is simply to discuss methodological issues faced by persons applying currently popular modes of network analysis. The intended audience is composed of individuals not yet conversant in - yet interested in - applying network concepts in their own substantive research. Hopefully, current network analysts will also find the collection useful as an exposure to problems encountered by analysts working in other analytical modes.

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SPECIAL ISSUE OF RECHERCHES SOCIOGRAPHIQUES ON SOCIAL NETWORKS
This Issue, Number 2, 1977, is now available.

A special issue of the French-Canadian sociological journal, Recherches Sociographiques, has just
come out which deals with social networks. It is edited by Professor Vincent Lemieux from the Uni-
versité Laval de Québec. The issue includes six papers. V. Lemieux and R. Fortin analyse two networks
affecting the founding of two community organizations in Quebec city. Their study deals (i) with the
relative importance of occupational, partisan and affective ties in the founding of these organizations,
(ii) with the connections between networks and corporate groups, and (iii) with the political meaning
of the issues in question in the networks. Couture and Gravel's paper studies the interlocking net-
works between members of hospital boards of directors with elected representatives. They point out how
these participatory mechanisms strengthen the boards' powers. In Simon Langlois' paper, one will find
an analysis of information flows on jobs through personal networks. It compares the networks of both
men and women and shows that the strong ties are important in lower occupational groups. It also com-
pares the results with Granovetter's data published in Getting a Job. Pierre Maranda refers to network
concepts in a content analysis of a short story which deals with networks of actors. Two research
notes are also published in the issue, the first by N.Leavy on graph theory and the other by P. Joubert
on the connections between networks and corporate groups. All the papers, published in French, are
summarized below. Copies of Recherches Sociographiques are available from (at $ CAN.4.00 per issue):
Revue Recherches Sociographiques, Presses de l'Université Laval, Université Laval, Québec, G1K 7P4,
Canada.

The above information and the following abstracts were provided by Simon Langlois.

LEMIEUX, Vincent et René FORTIN. 1977. "Réseaux et Appareils dans L'Implantation de Deux C.L.S.C."

        Etude de deux réseaux, reliés à l'implantation de C.L.S.C. dans un comté rural de la région administrative de Québec. Ces réseaux sont en relation avec des appareils du secteur public ou du secteur privé. A l'intérieur des réseaux on peut distinguer des liens occupationnels, des liens partisans et des liens affectifs (parenté, amitié, etc.). De façon générale les acteurs qui occupent des postes électifs jouent un rôle prédominant dans les réseaux.

COUTURE, Maurice et Jean-Paul GRAVEL. 1977. "Le Rôle des Réseaux dans la Composition des Nouveaux Conseils D'Administration des Centres Hospitaliers et des Centres D'Accueil."

        En vue d'évaluer les structures de participation des organismes para-publics, les auteurs analysent la composition des conseils d'administration des centres hospitaliers et des centres d'accueil dans le comté de Lévis. Les personnes élues ou nommées sur ces conseils à titre de représentants du milieu sont caractérisées selon leur appartenance de classe au moyen de deux indicateurs: l'occupation et l'appartenance au réseau des dirigeants des établissements étudiés. La majorité de ces représentants de la population s'avèrent reliés aux dirigeants des établissements. On conclut que les mécanismes de participation servent surtout à consolider le pouvoir de la partie patronale face à l'intervention du gouvernement.

LANGLOIS, Simon. 1977. "Les Réseaux Personnels et la Diffusion des Informations sur les Emplois."

        L'auteur propose une approche déductive pour montrer comment la structure et le contenu des réseaux personnels de relations sociales affectent l'accès à l'information sur les offres d'emplois dans une organisation. L'analyse porte sur les conditions qui affectent l'utilisation des différents champs de relations sociales (relations de sociabilité, relations occupationnelles et relations indirectes) à l'intérieur des réseaux personnels, sur les rapports entre les informateurs et les répondants et sur la longueur des chaînes d'informations. Deux résultats en particulier pourront retenir l'attention: la position de classe ne suffit pas à expliquer l'accès à certains types de relations et les liens forts jouent un rôle important dans la diffusion d'informations sur les emplois alors que les liens faibles ne semblent caractériser qu'un certain type d'occupations, les cadres et les administrateurs.

MARANDA, Pierre. 1977. "Cartographie Sémantique et Folklore: 'Le Diable beau danseur' à Rimouski."

        Une analyse digraphique de trois variantes de la légende <u>Le Diable beau danseur</u> permet d'abord d'en définir une structure élémentaire pouvant servir à des fins comparatives et taxinomiques. Ensuite, le passage des digraphes aux réseaux ajoute à l'analyse une dimension quantitative (débit des trajets) qui justifie le titre <u>Le Diable beau danseur</u> plutôt que <u>Rose Latulippe</u>. La problématique formelle utilisée dans cet essai débouche sur une psychosociologie du folklore.

LEAVY, Normand. 1977. "Aspects Techniques d'un Projet de Recherche sur L'Influence."

        L'auteur présente un projet de recherche sur l'influence, dont l'intention de base est de relier deux courants actuels des sciences sociales: le formalisme et le descriptif. On propose que l'adaptation au domaine de l'anthropologie de certains concepts mathématiques de la théorie des graphes et de l'algèbre des relations (écart, centralité, statut, connexité, densité, équilibre, équivalent structural) pourrait s'avérer profitable. L'interprétation anthropologique de ces concepts sert à élaborer quelques hypothèses théoriques concernant l'aspect relationnel du processus d'influence.

JOUBERT, Pierre. 1977. "Le 'réseau' comme Méthode d'Approche des Rapports Sociaux dans les Organisations."

        L'emploi de plus en plus répandu du terme de "réseau" dans les milieux scientifiques n'est pas sans relation avec les problèmes concrets de nos sociétés. Un exemple est donné à propos de la santé publique. Des mouvements de réseaux sont nécessaires pour réaliser ce qui est prévu dans le système. Ces réseaux peuvent être distingués en réseaux d'information, réseaux de consultation et réseaux d'instigation.

ANALOGUE MODELLING OF THE SMALL-WORLD PROBLEM: A COMMENT ON THE REVERSE SMALL-WORLD METHOD

Howard F. Andrews (University of Toronto)

ABSTRACT. The application of analogues from physical theory for modelling problems of social structure and process should not be ignored in exploring the characteristics of small-worlds. One source of potentially useful analogues might be process models drawn from percolation theory. A number of the structural characteristics of percolation problems are described, and certain relationships analogous to critical parameters in the abstract small-world problem are defined. It is suggested that the reverse small-world method is also analogous to methods of deriving numerical results for certain percolation problems.

The application of mathematical models of physical processes to the worlds of social processes and forms has had a long, though at times, regretably dubious history. Most of us, intrigued by the mathematical and statistical properties of social networks, have at one time or another speculated on their sometimes remarkably conceptual similarities with the properties of purely theoretical mathematical structures and models of the physical behaviour of totally inanimate or lower order biological phenomena. The notion that purposive and goal-directed behaviour of individuals, collectivities or institutions may be reduced at one level of analysis to models of, say, the behaviour of atoms on a plane, may be disarming in the extreme, but while the quest for theoretical understanding proceeds such analogue reasoning or lateral thinking should not be forgotten: the history of science tells us, after all, that they may turn out to be highly productive.

Consider, for example, the more or less simultaneous resolution of certain problems in the apparently diverse areas of kinetic theory, cosmic physics and biology, with the introduction of certain density functions in 1949-50. These different density functions, as noted by Srinivasan (1967), were simply different formulations of correlations associated with the same generalized stochastic process. What was common to the problems of the three fields was that the phenomena of interest – molecules, particles and individuals, respectively – are distributed over a continuous parameter characterizing the process, namely the phase-space of an individual molecule, energy-field and time(age).

Closer to the phenomena of social organization in space, diffusion models of the spread of innovation, the characteristics of 'social physics', gravity formulations of distance-decay effects on interaction and their more general articulation as entropy-maximizing models (Wilson 1967), are all examples of analogue reasoning; of bringing to bear on complex problems of social structures the better-formed theory and mathematical models of various physical processes. White has explored, albeit in a preliminary way, some of the more obvious structural relationships between elements of social networks and those of telecommunication systems (White 1973). One particular class of social network phenomena – the small-world problem – seems to be a potential candidate for further development through analogue models (Andrews 1977). As noted below, a recent discussion of the results of an experimental design characterized as the 'reverse small-world method' appears to support this contention (Bernard and Killworth forthcoming).

Essentially, Bernard and Killworth expand on the original design of the small-world method in an attempt to estimate the number of links people have "with the rest of the universe". Milgram's initial experiment (1967) was designed to estimate the number of links in a chain between the starter and target individuals, characterized by Bernard and Killworth as the target's "incoming network". Repeating the original design with many hundreds of starters would still provide only a more exhaustive indication of the incoming network of the single (target) individual, and would clearly present a variety of research problems from a logistical point of view. Instead, therefore, they estimate what would amount in the original method of Milgram to be the number of penultimate links to a single target individual, by reversing the design and requiring a single starter individual in effect to initiate chains with many (≈1000) targets. Given that the number and characteristics of these initial contacts (in relation to given attributes of the long list of target individuals) supplied the data for the experiment, chains of links were not generated beyond this first step. Indeed, the target individuals given to the respondents were fictional and their attributes were artificially constructed.

In a previous paper, it was suggested that the analysis of small worlds in their spatial contexts might proceed appropriately with certain analogues from <u>percolation theory</u> in mind (Andrews 1977). Percolation theory concerns the movement of some item through a medium: for example, of a fluid through a porous solid, the spread of disease through an orchard, rumour through a 'grape-vine' or, in the small-world problem, of a folder of information concerning a target individual. What is important to recognize in these situations is that the movement of the entity <u>per se</u> is deterministic (or purposive) and <u>not</u>

stochastic as would be characteristic of diffusion models. For example, viewing the small-world problem in diffusion terms would imply the <u>selection</u> of the next person in the chain (the recipient of the information on the target individual) to be a probabilistic process, which is patently not the case in the instructions given to participants in small-world experiments. Whatever stochastic mechanism influences the attributes of the passage of the item (such as length of chain, path taken, mean passage time, etc.) must therefore be ascribed to the medium through which the item moves, and it is this characteristic which identifies the process to be a percolation process, and not a diffusion process. Thus, we are ascribing to the space itself the stochastic qualities: we are faced, then, with the challenging notion of stochastic or random space, and the more appropriate analogues are to be found in the literature on random walks and random graphs, rather than, say, on the spatial diffusion of information or innovation.

Two classes of problems formed the focus of early attention in the development of percolation theory. Of these, the <u>bond problem</u> described below, bears more direct resemblance to the small-world problem, although the other class of <u>site problems</u> can, in many but not all instances, be converted to bond percolation problems. (However, the structure of all bond problems may be mapped as site problems, which makes the latter the more general of the two.) The medium of the bond percolation problem may be described as a partially oriented graph, though it has been demonstrated that in terms of certain results and characteristics of the problem, a fully-oriented graph or even unoriented graphs may also be described (Frisch and Hammersley 1963). The graph is thus made up of a set of abstract objects – atoms, sites, nodes, individuals – and a set of bonds connecting these objects. Bonds are therefore paths or links between nodes, oriented or unoriented, singly or severally connecting two nodes. The stochastic mechanism characterizing this medium consists of randomly and independently assigned probabilities to each bond such that the movement of the item along it, either is or is not possible: each bond has a probability $q = 1-p$ of being blocked and a probability p of being unblocked. In the language of the original development of the theory, a fluid is then introduced to a given subset of the nodes (the <u>source atoms</u>) and flows from node to node along those bonds which are unblocked and possess the appropriate orientation. The fluid therefore 'wets' of all of the atoms, outside of the subset of source atoms, which it is able to reach. The important outcomes of the theory are statements concerning the resultant set of wetted atoms. Some aspects of these may be summarized briefly.

The simplest and basic case is described when fluid is supplied to a single source atom only: the analogy here would be a single starter only in the small-world problem. Write $P_N(p)$ as the probability that the chain initiated by the single starter individual comprises at least N other individuals. $P_N(p)$ is a nonincreasing function of N and the <u>percolation probability</u>, $P(p)$ may be defined as the probability that the message from a single starter individual will reach infinitely many other individuals:

$$P(p) = \lim_{N \to \infty} P_N(p)$$

The <u>critical probability</u> above which all individuals will become connected, may also be defined:

$$P_0 = \sup_{P(p)=0} p$$

implying the chain extends only locally when $p < p_0$. A chain extending out from a single starter individual may also be characterized as a <u>self-avoiding walk</u> on the graph, i.e. a connected sequence of bonds and atoms, given the sense of bond orientation, which includes no atom-individual more than once (Hammersley and Morton 1954). Write $W_A(n)$ as the number of separate self-avoiding walks/chains of n steps/links. It has been shown (Hammersley 1957) that the linear graph may be characterized by a geometrical invariant, the connective constant, defined as:

$$k = \lim_{n \to \infty} n^{-1} \log W_A(n)$$

where k is independent of A and measures the richness of the connectivity of the medium. Further, a critical probability satisfies the relation

$$p_0 \geqslant e^{-k}.$$

The <u>reverse</u> small-world method designed by Bernard and Killworth and summarized above is, in effect, an effort to evaluate the function $P(p)$, and conceptually is closely parallel to the methods used to yield numerical estimates of this function in the literature on percolation processes. A summary of the resolution of this problem and the original references are included in Andrews (1977). While the phenomena of interest in the original development of percolation theory are distinctly different from those

of social networks in general and the small-world problem in particular, there is, I believe, sufficient communality in the conceptual underpinnings of both to merit closer attention. As Ross pointed out twenty years ago, the basic assumption of such a speculation is that

> ... two analogues are more likely to have further properties in common than if no resemblance existed at all, and that additional knowledge concerning one consequently provides some basis for a prediction of the existence of similar properties in the other .... (Ross 1958)

To date, the formal properties of percolation processes are far better known than those of processes embedded in social networks. It would appear that the basic assumption of analogue reasoning described by Ross is certainly worth accepting for the short term at least, and the potentially fruitful applications of percolation models for examining the structure of social networks merit further attention.

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STRUCTURALIST ANALYSIS OF DATA IN SOCIOLOGY

Joel H. Levine (Dartmouth College) and Nicholas C. Mullins (Indiana University)

ABSTRACT. Harrison White and colleagues have developed a framework of descriptive and analytic methods, blockmodels, for the structural analysis of sociological data (White et al., 1976; Boorman and White, 1976). They have created a structure that incorporates a wide range of assumptions about data, about the presumptive nature of social relations and about the structure of structuralist theories of social behavior. We will discuss blockmodeling in terms of the theoretical problems it is meant to solve and suggest alternative assumptions, thereby placing blockmodeling as one solution among many possible (but mostly untried) solutions to the problems of structural analysis.

(Editor's note: Readers interested in blockmodels should consult the paper by Phipps Arabie, Scott Boorman and Paul Levitt (1978), whose abstract appears later in this issue. It is a clear explanation and review of the concept, its development and its use.)

The theoretical and methodological problems that distinguish contemporary structural analysis from the preceeding generation of sociological theorists stem from the definition of the unit of analysis. The unit is a relation, e.g., the kinship relation among persons, the communication links among officers of an organization, the friendship structure within a small group. The interesting feature of a relation is its pattern: it has neither age, sex, religion, nor income, nor attitudes; although these may be attributes of the individuals among whom the relation exists. These fundamental definitions prevent structuralists from adopting measurement techniques and methodologies available to other socio- logists (e.g., you cannot interview a friendship). A structuralist may ask whether and to what degree friendship is transitive or clustered. He may examine the logical consistency of a set of kin rules, the circularity or hierarchy of communica- tion, or the cliqueishness of friendship. We have, as yet, few tools for these tasks and almost none upon which there is universal agreement. Simply defining such terms as degree of transitivity has proven difficult.

THEORETICAL IMPLICATIONS

As with any research, blockmodeling concentrates on some problems and skims others solving them superficially to permit further work. Among the major problems faced and solved by blockmodeling are:

1. Transformation of ambiguous social, cultural, and behavioral phenomena into data: White uses binary matrices and relations as the "data" upon which the formal analysis begins. The problems of the adequacy of the representation are not considered.
2. Abstraction of reality so that problems retain important features of still larger problems, without at the same time being so complex as to defy analysis: Blocking forcefully reduces the complexity of reality both in its choice of "data" and by mapping data matrices into still-simpler "images" which are then the basis for further analysis.
3. Decision rules: White gives some hints for testing the goodness of fit of the models, their validity, etc. However, the lack of simple-appearing standards, such as the distributional methods by which we compare ordinary variables and test conventional models makes decision rules either unfamiliar or "judgmental".
4. Compounding and aggregation of the units: The analytically separate relations must aggregate to form other substantively significant relations. White's choice of Boolean matrix multiplication is more than a mathematical device. It is a hypothesis. It is one model for the compounding or relation such as "friend" and "enemy". They have hypothesized that the semigroups generated by this multiplication (and, implicitly, not by other compounding rules) are the important aspects of patterns of compound social relations.
5. Maintenance of logical consistency among explanations (of empirically consistent phenomena). When theorizing is being done about images, theorizing about the joint homomorphism of two sets of images must be consistent with it.
6. Construction of an analytical system that describes the regularities, simplicities and laws of behavior, and which generates explanations of observed behavior and predictions about, as yet, unobserved behavior. White's system, like most structuralist analysis is weak here. There are indications of rules such as the "first letter last letter law" (Lorrain, 1975), but not much else.

These six topics are only a subset of others that exist and which have been solved by blockmodeling. However, each of these problems admits of alternative solutions.

The Transformation of Phenomena into Data

Transforming a relation such as friendship by means of a sociomatrix codifies friendship as a binary relation, and not as an individual, a triadic, or an n-adic relation. The relation requires that pairs of persons be either "in" the relation or "out". It atomizes reality into separate relations--friend, enemy, patron, client--that can be reintegrated only (if at all) at some later stage of theoretical development.

A different procedure might conceptualize friendship not as an attribute but as the state of an exchange process. Then reality would be transformed into data not as a relation matrix but as a frequency table that reported the number of times the behavior occurred (see, Winship, 1977; Small's, 1974, treatment of citation data). Continuous data (describing the intensity of relational ties), or signed data (common among balance theorists), or frequency data are as suitable to structural analysis, a priori, as are the binary data favored by White.

White's choice constitutes a working hypothesis that may or may not prove adequate against alternative forms of data. Many of the subsequent assumptions of blockmodeling depend on the deftness of this working hypothesis. Concatenation of data matrices and of images (under blockmodeling) requires a simple model: $1x1=1$, $1x0=0x1=0x0=0$, $1+1=1+0=0+1=1$, $0+0=0$. If $0,1$ data prove too simple, or if some other calculus of values is required, then White's rules of concatentation, his algebra, and his homomophism cease to be well defined. If this working hypothesis is not sound then the method he has based upon it will be replaced by other abstractions and other structuralist calculii.

The data on the bank wiring room are the product of an observer who watched interaction in the bank wiring room of the Hawthorne Plant of Western Electric for several months. The "data", i.e., that which is immediately subject to blockmodeling, are a construction by the observer. In the observer's construct, friendship is always reciprocal so the matrix is always symmetrical, it has not degree, and is averaged across time. But everyone has the experience of the "very good friend" with whom you have not spoken in several years. If the actual interaction aspect of the friendship were causally important, then the difference between good friends with and with out interaction would be crucial, in any explanation constructed from this data.

Tractability

If one gathers data in sufficient detail, virtually every one of the 100 or more individuals in a net or multinet will be unique vis-a-vis other individuals. However, even if there exist theoretically relevant distinctions among the individuals, it may be neither necessary, nor desirable, nor practical to deal with the fine detail of these distinctions. It is necessary to simplify--to reduce reality to an image that can be analyzed. White et al. (1976) talk of blocks--2-block, 4-block, and more refined blockmodels of structurally equivalent individuals. Structural equivalence reduces the hundreds of persons in a social to 2, 4, or more blocks embedded in relatively simple relations; thus blocking is a strategic simplification introduced to permit attention to and clarification of other complexities in a problem. The procedure parallels an earlier generation's use of the concept of social class. Analysts knew well that differences existed within classes and that some cases fell between classes, but the simplification was (arguably) useful. A different procedure (available to structuralists and stratification theorists alike) is to introduce continua and variables--again as a simplification, knowing that real social continua rarely exists. (Even income and education are continua by theoretical

construct only).

As a block modeler might use an algorithm to map many distinct individuals into a small number of discrete blocks, the analyst using continuous methods will look for algorithms, such as factor analysis, that map the data into a small number of scaling dimensions. For example, Laumann and Pappi (1976) used the smallest-space technique to describe a community elite by using a few scaling dimensions. These were enough to order and organize the variety of individual distinctions and intermediate positions.

Levine (1972) used another variant of smallest-space analysis to map inter-locks between corporations. Hecht's (1977) social area analysis uses conventional factor analysis for a similar purpose.

Decision Rules, Describing, Classifying, and Comparing Relations

Reduced to an array of 1's and 0's, the whole pattern of a relation can be grasped intuitively, and patterns derived from different relations and different data sets may be easily compared and interpreted. Early in the development of blockmodels, White and his colleagues produced a book of 3 x 3 tables that named, interpreted, and classified the various patterns (Lorrain, 1975). Thus, Breiger (1976) was able to characterize his relations as a "center/periphery" pattern and Mullins et al., (1977) detected the same pattern even though each was referring to a pattern formed by subjectively different relations in different populations. The simplicity of the images permits analysts to work without fixed rules for describing, classifying, and comparing relations. The simplification allows researchers to ask questions like: Are there only a few basic patterns by which types of relations are distributed through a group? Is there one pattern for positive relations, another for negative relations, a third for authority relations, and so forth?

An alternative to these classifications is provided by the triad counts of Davis, et al. (1972), which characterize a network for one relation with frequency profiles for unique triadic subsets of an n x n relation. Currently they enumerate the frequency of 16 subsets; see Davis, 1975, and critique by Elmore, 1977. The triad counts allow 16-dimensional characterization of any complete relation as well as "one-dimensional tau-characterizations" that enable comparison of a relation's actual profile with hypothetical profile expected under various structural hypotheses. Still earlier sets of alternatives are (1) the profiles and hierarchy measures of Landau (1953), and (2) the classical "circle, Y, wheel, chain" typology limited to 5-person groups (Bavelas, 1950), and (3) the counts of sociometric "stars" and "iso-lates" (Moreno, 1936).

White et al., (1976) used a four-blockmodel to simplify data on the bank wiring room; the model places the 14 people into four categories. The emphasis mapping places the explanatory burden on the distribution of persons to blocks (i.e., the association of the patterns images with patterns formed by the semigroup; (Boorman and White, 1976). Thus, the relatively simple semigroup for the data was combined with a large number of other images in a search for common structure.

This analysis has quite a different focus from the search (of the same data) for patterns of leadership and centrality (Homans, 1950) and is not easily related to the psychological model of exchange embedded in Homans (1964) which was developed at least in part as an explanatory effort for this data.

Concatenation and Compounding of Relations

Binary multiplication of matrices of relations has often been used to imply indirect relations that are the consequence of a single compound relation (see, e.g., Katz, 1947). Weil (1969) and Kemeny, Snell and Thompson (1956) used matrix multiplication to indicate the effects of two or more different relations and suggested that it might be a way to test Levi-Strauss's (1969) kinship models. White (1963) used matrix multiplication to model the social process in which relations combine. Lorrain and White (1972) added two important generalizations. By applying multiplication to the block images of the detailed relations they were able to describe the product of two negative relations (or two positive relations) at a level of generality that is removed from the detail of any one set of data or of any one instance of these relations. For example, they could (1) report that image A is the inverse of B and C is the inverse of D and (2) draw an abstract parallel between A and C and between B and D that did not rely on subjective knowledge about the meaning of the relations. They also pushed matrix multiplication to one of its logical conclusions by using the full semigroup of all products and all combinations of products. They were trying to discover whether concatenated relations had an independent social significance; are my enemy's enemies allies? Is my father's brother an uncle (does he, therefore, have direct obligations to me?)

It remains to be seen whether,for all relations,the modulo-2 arithmetic assumed in these procedures provides a good model for their actual combination. It may prove inadequate for relations that attenuate from person to person.

If binary codes remain as the record of a relation one might well consider set intersection and complements (with one exception among the Bank Wiring Room data antagonist are the complement of the union of liking and helping pairs). The choice among rules of concatenation should be determined by successful (and unsuccessful) attempts to model composition and indirect relations in real data and not (solely) on the basis of mathematical elegance which may follow from convenient assumptions.

Consistency

Blockmodeling is the first technique for analyzing social structure that (1) operates on more than two levels and (2) is consistent. The technique begins with data represented as relations and block matrices (2 x 2, 3 x 3, etc.); image matrices are abstracted from these matrices. Each set of matrices exists at a different degree of abstraction from reality, and each is subject to Boolean multiplication. Images and data matrices must be consistent (homomorphic)--i.e., that the image of a product just be the product of the images--is not only required; in one algorithm (BLOCKER) consistency is the criterion for successful assignment (if any) of elements to blocks (Heil and White, 1976). Other forms of consistency may be attained by comparing (1) multiplication tables abstracted initially from different data sets, (2) different degrees of refinement into blocks, and (3) the algebra that results from multiplying images.

Blockmodeling gives sociology a glimmer of what a full-fledged quantitative theory of social structure eventually might look like. However, the most abstract (and sometimes exquisite) elements of this structure are still relatively untested, however elegantly they are related to the lower level simplifications, e.g., relating the data (represented as binary relations) to the simplification of the data (images) to the manipulation of image relations (by Boolean multiplication). Thus the higher-level abstractions will require modification if the underlying simplifications need to be changed.

Boolean multiplication may prove not to be the best way to model the interaction of social relations. If not, then the alternative calculus would also be required to generate a consistent superstructure of abstractions. With the possible exception of Parson's work there has been no parallel effort by other theorists either quantitative or qualitative.

Construction of an Analytical Explanatory System

There should be a natural and easy progression: (1) initial descriptive sketches of a phenomenon, (2) orderly grasp of its regularities, and (3) analytical systems that predict what can and what cannot occur in data (and in reality). This subjects the whole cumulative enterprise to test and revision. The system can be either causal or syntactical. A causal system is suggested by statements such as "If A, then B." Sociologists have been accustomed to this system. It is the implied or explicit goal of path modelers and of many garden-variety applications of linear analysis. A syntactical model is suggested by phrases such as "well formed." It is more common to linguistics and (among sociologists), to structrualists. The test of a syntactical theory is a grammar that can generate (at least in principle) all grammatical sentences and that cannot generate ungrammatical ones. Sociologists sometimes have assessed the grammatical correctness of an expressed social structure in terms of present forms, but the possibility of other forms usually is not considered. The fundamental character of generative theories is the transformation of patterns based on a set of rules. A non sociological example is the transformational grammar of Chomsky (1965). Indeed the combination of social relations by multiplication seems directly analogous to the structural linguistic combination of syntactical relations by concatenation. However, finite state concatenational grammars are known to be inadequate for English syntax (Chomsky, 1965),and structuralist also eventually may require a social model in which the presence of a given social relation conditions and modifies the generation of other elements in a well-formed social structure. For example, the structural analyses of Piaget (1970), or Levi-Strauss (1969) may not be testable by blockmodeling. Furthermore, the works of these and other structuralists may not be mutually consistent; nevertheless, the inconsistencies suggest sites for future research by structuralists. For example, Foucault's (1966) Madness and Civilization suggests studies of relationships between hospitals, patients and practitioners that would produce results quite different from any in current medical sociology. These and many other studies will be needed to test the adequacy of blockmodeling and its associated theoretical perspective.

When a specific case is examined, quite different theoretical systems may be relevant. For example, Homans presents two different analyses of the Bank Wiring Room. The first is a causal system that is embedded in a theory of social exchange and is best represented in the Human Group (1950). The second, also causal, is based on social behaviorist principles and is found in Social Behavior: Its Elementary Forms. In both presentations the relevant units are the individuals and the attempt is to explain the rate of individual behavior. Both differ fundamentally from White's system because they are based explicitly on a deductive causal model,whose purpose is to explain individual behavior in terms of specific preconditions under which certain types of individual behavior will occur. In contrast, White focuses on the consistency of patterns between different types of behavior, including behaviors composed of several behaviors that are not included in the original data which produced the blockmodel.

CONCLUSIONS

Blockmodeling is the first integrated quantitative approach to structural analysis of data. The technique offers solutions to some basic problems that have prevented structuralists from adopting conventional measurement techniques and methods. White's blockmodeling uses a new form of data to represent social relations, tractable simplification of the data; a variety of algorithms to organize the simplified data as well as an algebra for combining them, classifications of the results and an analytical system that integrates these units as a whole. White's separate choice and the system as a whole constitute a series of working hypotheses. Each is subject to test, to enrichment, and to replacement by alternative hypotheses. Blockmodeling then, represents the opening of a line of analysis in need of development as it is applied to wider ranges of substantive problems.

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CANADIAN INTERCORPORATE LINKAGES

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ABSTRACT. *This paper consists of the Discussant's comments on the 'Corporate Interlocks' session at the New Directions in Structural Analysis Colloquium, March 16 - 18, 1978, New College, University of Toronto (see CONNECTIONS I, No. 2, pp. 12-13). The two papers presented were Michael D. Ornstein "Assessing the Meaning of Corporate Interlocks." and Stephen Berkowitz, et al. "Measuring Enterprise Structure and Corporate Power in Canada."*

Both papers begin by raising what I take to be the crucial methodological issue in this whole area of corporate network analysis: the question of what substantive meaning we are to assign to links, either in the form of directorship interlocks or equity participation between corporate entities. It is assumed in this literature, no doubt correctly, that these links on which we can identify and model networks stand for some important dynamic features of the economy: that interlocks and ownership ties are channels along which some significant socio-economic fluid flows; or, alternatively, that they are a sort of cement holding together the elementary particles of an inherently meaningful whole; or that they are both at once. The problem, of course, is that we do not have a very clear understanding of what sort of meaning these linking elements or the whole networks for which they furnish the ties may be said to possess, and in the absence of this understanding the enterprise of building, populating and simplifying the network structures is a rather arbitrary one. Both of our papers today address this problem of meaning, and I should like to look at them from this point of view, to see how, and how successfully, they deal with it.

Ornstein is concerned with interlocking directorships. He points out that advances in techniques of identifying and modelling directorship networks have not been matched by a corresponding sophistication in our understanding of what these interlocks stand for. Network analysis itself has not been overly useful in yielding hypotheses about this question of meaning: we know that big firms have more interlocks than small ones; that Canadian firms have more than U.S. subsidiaries in Canada; and that these relationships seem to be independent of other characteristics of the firms. He identifies two possible approaches; one in which the firm is taken as the unit of analysis; the other in which the whole network is the unit. I might mention in passing that there is a third, unexamined, strategy, which focusses on the directorship links themselves as units of analysis. This is implied by Ornstein's comment that if we want to understand how and for what purposes directors are recruited and the contributions they make to the firms they link, we could go and ask the directors themselves. Such a strategy, it seems to me, would be of additional value in assessing the substantive meaning of directorship links insofar as it could furnish a comparison between those who serve on two or more boards, and those who are single directors. This is important because the null hypothesis in studies of directorship linkages must be that the value of any given director to a board is independent of his position on other boards. Even were this to be formally rejected, it would still leave open what seems to me to be very likely; that a large proportion of interlocking directorships are truly accidental; that in selecting a director, particularly one who sits on a number of boards, some at least of these connections will be of minimal utility to the selecting board. If we look at Ornstein's pilot longitudinal analysis, it is clear that, with the possible exception of interlocks to banks, the null hypothesis that I have outlined is not rejected. Unless we are willing to assume that there is a single criterion for the appointment of directors, and that this criterion does not change over time, I do not see that Ornstein's prescription of historical studies of changes in directorship interlocks will meet this problem. He makes the assumption that changes in the networks over time reflect changes "in the structure of the Canadian capitalist class",

but while this assumption may be valid - it surely ought to be testable - it does not really speak to the question of what directorship interlocks mean. Changes in the class structure would presumably translate into changes in the pool of potential directors, but from this it does not follow that we shall gain a better understanding of the substantive connotations of directorship interlocks for individual firms or for the network as a whole. It seems likely that our knowledge of the content of these links must wait on studies of directors, their appointments and their behaviour, studies outside the field of structural network analysis, but which are clearly essential preconditions for the network analysts' ability to put flesh on the skeletal structure.

The paper by Berkowitz et al. concerns itself primarily with technical aspects of measuring corporate concentration, and as I have already pointed out, I do not intend to address the adequacy of the formal models proposed. But the paper does recognize that there is a substantive dimension to the analysis, and like Ornstein's, it raises the question of how we are to go about interpreting the meaning of ties - in this case, intercorporate ownership ties as well as directorship links. The paper proposes that we separate the grammar of motives from the syntactical structure of the network, and look at it instead as a system of capital mobilization. This seems to me to be a potentially fruitful approach, although I have some reservations as to whether capital mobilization is the sole functional component of these structures, as well as to whether this function is uniquely a property of these types of networks. But it seems to me that when the authors move into the analysis of structure, they leave the question of capital mobilization behind. If it is an hypothesis that these links are channels along which capital flows, surely it is incumbent on them to show that this does in fact happen: - but the data on intercorporate ownership and interlocking directorships are not equal to this task. What is required is some enterprise-level equivalent of the interindustry flow table to bring to the formal structure of the network. Now, I suspect that the data which would be needed to construct such a table are simply not available - but it is clear that to make the ownership/directorship network stand for these data is to beg the question.

The authors are in fact doing this or so it seems from their analysis of capital mobilization. From the assumptions that network interconnections are non-random and that access to capital is not coextensive with ownership of capital, they wish to argue, first, that the patterning of ties is an index of ability to gain access to capital, and, second, that interlocked corporations form a capital pool. These conclusions do not follow from the assumptions, however, for two intermediate reasons. The first one is recognized by the authors in the codicil they attach, that the pattern of ties "must be explicitly related to corporate behaviour." Once again, this would seem to require some extra-structural studies of specific corporate behaviours. The null hypothesis here would be that the relevant behaviours are independent of the patterning of ties. Unless this can be rejected. the argument must fail; and there is no attempt here to show that it can in fact be rejected. The second problem is that even if the null hypothesis may be rejected for "the patterning of ties" in general, it is still incumbent on the authors to demonstrate that the relevant ties are ownership and/or directorship interlocks. Take for example the frequent corporate practice of raising short-term loans from banks. The argument here could only be sustained if it could be showing first, that a corporation's ability to borrow money at favourable rates from a given bank is enhanced by the fact it shares a director with that bank; and, second, that the sharing of the director is the relevant consideration. This second criterion would be vitiated if it was to be argued simply that the directorship interlock is an index or reflection of the corporation - bank relationship, but the first criterion would still have to be met. And in any case, we would want to meet the second in order to justify our emphasis on this particular mode of interrelationship to the exclusion of others. For if we had the data on capital borrowing, we could presumably construct the network on that basis and ignore directors entirely - we would not need an index if the characteristic it is presumed to reflect were directly measurable, unless we thought directorship interlocks were relevant in their own right. Once again, we need to step outside of straightforward network analysis to grasp the substantive dimension.

To conclude, then, both papers raise the question of what corporate interlocks mean, and both attempt to elicit that meaning through modifications of structural analysis. But this procedure must of necessity beg the question. There seem to be two alternative strategies. One is to attempt the construction of networks using alternative links, and to measure the extent to which networks of ownership or directorship parallel networks of capital mobilization or other behavioural characteristics. The other is to step outside the structural framework to elucidate the substantive features of the links we are presently using. These strategies, one expects, will converge to the extent that the corporate behaviours on which networks are modelled turn out to be those characteristic of directorship recruitment and behaviour, and at that point the sophisticated modelling techniques we now possess should become extraordinarily useful tools to understand the organization of economic power. In the absence of this substantive investigation and this convergence, they must remain beautiful machines for the production of elegant uncertainty.

RESEARCH REPORTS

SOCIAL NETWORKS AND HEALTH: AN INITIAL REPORT

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This report provides an up-to-date bibliography on various aspects of social networks and health and is designed to facilitate communications among investigators within this field.

With respect to physical and mental health, social network and related concepts have stimulated (1) research on the social antecedents and consequences of specific disorders; (2) research on the utilization of lay and professional services; and (3) the development of innovative forms of remedial and preventive intervention. In addition, the notion of a social network provides a useful conceptual framework for organizing existing forms of professional intervention in terms of the ways in which they alter the patients' involvement with others.

Social network concepts provide a common language for the exchange of information among various academic disciplines and various helping professions. The application of social network concepts within the fields of mental and physical health promises to provide a synthesis of knowledge derived from these various disciplines. However, efforts in pursuit of this objective have been underway for less than a decade. As a result, measurement is rudimentary, the empirical base just beginning to unfold, and although promising therapeutic techniques have been developed, their efficacy has yet to be demonstrated. Furthermore, although the this field is growing rapidly in terms of published material many investigators appear to be working in relative isolation from one another. In light of these short-comings this report has been prepared to assist in the orderly development of this field.

This report has been divided into two sections, the Selected Bibliography and Current Projects. The first part of this report provides up-to-date documentation of published and unpublished papers and books dealing with some aspect of social networks/social supports as they are related to physical, emotional and behavioral disorders. This portion of the report has been divided into five major sections; Theory, Empirical Findings, Interventions, Clinical Assessment and Measurement, and Bibliographies. The second part of this report provides the reader with information on current and planned investigations. For further information of this nature please consult the Directory of this and previous issues of Connections.

Procedure

Early in 1978 an exhaustive computer-based bibliographic search was completed on Medline, Psychological Abstracts, Sociological Abstracts, Social Science Citation Index, National Technical Information Service, Smithsonian Science Information Exchange, and the Information Clearinghouse of the National Institute of Mental Health. These searches involved the following keywords: Social Network(s), Social Support(s), Social Resource(s), Support Network(s). This literature search yielded approximately 450 abstracts. Of these, approximately 150 references appeared to merit further attention. Attempts were made to locate and examine these articles and books in order to determine their appropriateness for this report. Needless to say, not all of these papers were readily available.

The computer-based bibliographic search yielded a reasonably thorough scan of the literature up until the end of 1977. In order to obtain a more up-to-date review, two additional procedures were employed. First, form letters were sent to approximately 150 researchers and clinicians within the field of social networks and health. Responses were received from 41 investigators in the field. These responses provided additional references and in some cases descriptions of ongoing research. Second, a hand search was conducted through various periodicals in the medical, sociological, psychological, and social work fields. This procedure yielded additional references and brought the review up to April 1978.

As indicated, it was not possible to examine all articles, papers, and books in order to determine their appropriateness for this report. Undoubtedly, some deserving articles have been omitted and some articles which have been included may provide only a minor contribution to the field.

The references that were selected were divided into categories according to their dominant theme. Articles which touched on a variety of topics or issues were arbitrarily assigned to one category or another. The reader is encouraged, therefore, to examine all the references carefully.

For example, there are articles in addition to those included in the measurement and assessment section which deal with these topics.

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CURRENT PROJECTS

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    Salisbury, North Carolina, U.S.A. 28144

Grant Title: Biographical Predictors of treatment success on an alcoholic ward.

Technical Summary: Prior findings of this study indicated that patients who reached a success criteria of six months' abstinence from alcohol tended to be characterized by a greater number of "intact" social supports as opposed to failure groups. Data collection continued through April 1, 1976, at which time 850 patients had been administered a revised form of the Salisbury Information Scale and the Manson Evaluation. Further collection of data is not considered feasible, and efforts are now being directed toward various methods of ordering, processing, and assessing this mass of data.

Boulder, J.
    #104 - 2095 California Street
    San Francisco, California, U.S.A. 94109

The Interpersonal Support Network provides continuing intimacy and support for individuals in an impersonal and changing society. Opportunities for friendship, romance, and laughter are expanded through family and Network-sponsored events such as dances, parties, and play days. Personal identity, emotional support, and freedom are protected and nurtured within the family.

Campbell, A., Kahn, R., Converse, P.
    University of Michigan
    Institute for Social Research
    Psychology and Sociology
    Ann Arbor, Michigan, U.S.A. 48104

Grant Title: Indicators of social change.

Technical Summary: The proposed study will "monitor" the quality of life over the decade from 1971 through 1980, documenting nationwide trends in the ways in which Americans evaluate their lives, and relating people's personal assessments to changes in their objective circumstances. In addition, this research will explore the extent to which people give and receive social support from significant other people during life transitions which are particularly stressful as they move from school to work, retire, or lose a mate. The study, following a modified panel design, will make possible an analysis of aging as it varies from one cohort (or generation) to the next and as it reflects historical and social change. The project has the advantage of allowing cooperation and synthesis with several Foundation programs especially with the program on age, which has originated and developed concepts and methods to be employed in this new research.

Caplan, R.D.
    Research Center for Group Dynamics
    Institute for Social Research
    The University of Michigan
    Ann Arbor, Michigan, U.S.A. 48106

We are testing the hypothesis that social support from a health practitioner (nurse) increases the adherence of the patient to a regimen for high blood pressure. Hypothesized mechanics by which social support has its effects include the following: social support increases patient feelings of self-esteem and self-competence, patient knowledge of the medical regimen, patient belief in the utility of following the regimen, and these variables in turn increase patient adherence to the regimen. The design includes a field experiment coupled with a longitudinal survey at four points in time over one year. Approximately 540 patients with essential hypertension were drawn into the study at intake. Ratings by the nurse and by the patient of the social support from the nurse are being obtained and compared for their predictive power and for their relationship to one another. A nonrandom sample of outpatient clinics is being studied representing a variety of health care settings. Within each clinic, assignment to experimental and control groups is random. Social support is manipulated experimentally in two conditions: (a) nurses are given a protocol for providing social support, and (b), condition (a) is combined with a protocol which involves training the partners of a sample of patients in how to provide social support to the patients. Partners can include relatives, friends, or spouses.

Curtis, W.R.
    Social Matrix Research Inc.

Ex. Office of Human Services
State House Room 212B
Boston, Massachusetts, U.S.A. 02133

My current research project is part of a larger effort by the Executive Office of Human Services in Massachusetts to coordinate the planning and management of human services. One of the major variables we will be investigating is the increased use of informal resources from the community. We will be looking at the support that comes from local organizations and citizens, as well as the involvement of members of client's social network during treatment.

Dibble, E., Gershon, E.
    U.S. Dept. of Hlth. Ed. & Wel.
    Public Health Service
    National Institute of Mental Health
    Section on Psychogenetics
    Bethesda, Maryland, U.S.A. 20014

Grant Title: Life events and degree of social alienation in affective disorders.

Technical Summary: The purpose of this investigation is to measure the relationship between the number and kind of life events, the amount of subjectively felt social support and social alienation to mood disorders and to changes in specified biochemical levels in affectively disturbed patients vs. controls. The inventory of Life Events and Support scale, adapted from earlier research scales, will be used in conjunction with the family study interview and blood studies of patients and controls and their family members.

Disbrow, M.A., Doerr, H., Caulfield, C., Boler, C., Knight, M., Smith, M., Leik, R.
    University of Washington
    School of Nursing
    C309 Health Sciences Building
    Seattle, Washington, U.S.A. 98105

Grant Title: Measures to predict child abuse - A validation study.

Technical Summary: The proposed study will validate a battery of measures developed to identify parents with potential for abuse of infants and children. The measures were tested with abusive and non-abusive parents, during the developmental stage. A sample of parents stratified on race, and economic status will be screened and 200 families, half high risk and half low risk, will be followed for 2 1/2 years. The variables, parents' background, personality, child rearing attitudes, life changes, social network resources, parent-child interactions, and health care seeking behavior will be tested by interview, questionnaire and behavioral observation. Physiologic response to pleasant and unpleasant child behaviors will also be tested and correlated with the other variables.

Erickson, Gerald D.
    Director
    Psychological Service Centre
    The University of Manitoba
    Winnipeg, Manitoba, Canada R3T 2N2

Current Project: "The Development of a Differentiated Network and Family Practice in Juvenile Corrections." This project is at the proposal stage. It is designed to test out three treatment strategies with juveniles entering the corrections system. One form of treatment will involve an emphasis on network building activities with juveniles from devastated families.

Finlayson, A.
    Greenloaning
    Kingsbarns, St. Andrews
    Scotland

I am interested in the identification of informal support systems in life transitions and long-term stresses; and the implications for professional services. My bias is towards intervention and empirical findings rather than theory or measurement. At present I have no papers in press nor manuscripts for circulation.

Fischer, C.S.
    University of California
    School of Environmental Design, Sociology
    Campus Research Office

250 Sproul Hall
Berkeley, California, U.S.A. 94720

Grant Title: Effect of urbanism on social networks and mental health.

Technical Summary: This research is intended to answer the question, What are the direct effects of urban residence on people's social relationships and personalities? Though theoretical speculation has long abounded that city life per se contributes to urban problems, to date no research has been adequately designed or sufficiently comprehensive to test those theories. The project has two specific objectives: (1) to determine how macro environmental factors (e.g., neighborhood density) affect social networks and personalities; (2) to determine how individuals make environmental decisions so as to best protect both networks and personality.

Gottlieb, B.H.
     Assistant Professor
     College of Social Science
     Department of Psychology
     University of Guelph
     Guelph, Ontario, Canada N1G 2W1

We are currently involved in a project with three local family physicians who have agreed to hold support groups for new parents in their respective practises. The physicians convene with the parents in their own homes for a period of 8 weeks to discuss the stresses and the joys of new parenthood. The parents have been randomly selected for these sessions and there is a control group of randomly selected new parents who are receiving educational materials only. Both groups are being administered pre- and post-tests of their levels of parenting stress, their level of involvement with an informal support system and their sense of general well-being. The results should be available by August.

Graham, Susan Brandt
     Assistant Professor of Anthropology
     Department of Sociology
     University of Missouri
     Kansas City, Missouri, U.S.A. 64110

Almost every mother is aware that the arrival of children produces drastic changes in a woman's life. Although volumes have written about the physiological changes in a woman's body, changes in the daily life of women assuming the role of mother have scarcely been given any recognition in the literature of the medical or social sciences. Women who attempt to discuss with their physicians some of the problems associated with motherhood are frequently told that all problems will disappear as hormonal balance returns to the prepregnancy state: i.e. all problems are physiological and not social. However, if this is true, why are problems such as depression and child abuse found long after prepregnancy hormonal balance has returned? The results of my network study suggest that social changes far outlast the relatively brief physiological changes.

Henderson, A.S.
     Social Psychiatry Research Unit
     The Australian National University
     Canberra, ACT 2600
     Australia

Our Unit is currently engaged in an ambitious population study in Canberra in which we are studying the relationships between non-psychotic psychiatric disorder, social bonds and life events. The paper in Brit. J. Psychiat., May 1978, reports some preliminary findings.

Lightman, E.S., Lambert, C.
     Faculty of Social Work
     University of Toronto
     246 Bloor Street West
     Toronto, Ontario, Canada M5S 1A1

Voluntary blood donors: Active and lapsed. This study expands upon Richard Titmuss' research in The Gift Relationship to probe patterns of and motivation for voluntary blood donorship in Toronto, Canada. Voluntary giving without expectation of direct return represents an important dimension in the helping network; the present study will attempt to probe breaks in or dissolution of the network by examining factors which cause individuals to cease being donors, after they voluntarily give one or more times.

Miller, P.
    MRC Unit for Epidemiological Studies in Psychiatry
    University Department of Psychiatry
    Royal Edinburgh Hospital
    Morningside Park, Edinburgh, Scotland EH10 5HF

Dr. Jack Ingham and myself are currently working on a survey of 2140 people in Livingston New Town. The main aims are (1) to investigate why some people consult their doctors with particular symptoms while other people in the population who have the same symptom to the same degree do not consult their doctor; (2) to discover correlates of the symptoms; (3) to predict symptoms and consulting behavior during the year following our contact with each subject. Life events and different types of social support are two of the main variables in the study.

Pancoast, Diane
    Regional Research Institute for Human Services
    Portland State University
    P.O. Box 751
    Portland, Oregon, U.S.A. 97207

I teach a course on Natural Helping Networks at the Portland State University School of Social Work and could supply a copy of my course outline to anyone who was interested. Also, I am about to interview a large sample of persons with epilepsy to investigate the role of social supports in their ability to cope with the problems caused by their disability. The research is part of a comprehensive study of epilepsy being conducted by the Regional Research Institute at Portland State University and Good Samaritan Hospital. I would be very interested in learning about any other research on social supports and chronic disabilities.

Reeder, L.G., Berkanovic, E., Reeder, S.J., Marcus, A.
    University of California
    School of Letters and Science
    Public Health
    405 Hilgard Avenue
    Los Angeles, California, U.S.A. 90024

Technical Summary: This research intends to examine social and psychological factors related to the processes involved in definitions of individual health status, delay behavior in seeking medical care, and adherence with medical advice (cessation of smoking, alcohol consumption, follow-up care, etc). Socioenvironmental and psychosocial factors, especially the role of social networks, such as the family and friends, in the decision-making processes involved in defining oneself as ill, seeking medical care, and following a medical regimen are especially relevant in cancer prevention and rehabilitation. Two main elements of this study are: (1) investigation of the processes of health behavior through a panel design, and (2) examination of long-term trends of health status, attitudes, and behavior. The objectives are to add to our knowledge and understanding of the basic processes in health behavior of direct relevance to programs of cancer prevention and rehabilitation. The basic methodology is the survey interview. A series of methodological substudies are included in the research design to provide much-needed data to reduce the cost of health surveys.

Scheurell, R.P.
    Coordinator, Undergraduate Social Work Program
    School of Social Welfare
    University of Wisconsin
    Milwaukee, Wisconsin, U.S.A. 53201

I am currently working on a paper entitled "Understanding Social Network Theory through Genealogical Self Study."

Schlesinger, B., & Lightman, E.S., Lambert, C.
    Faculty of Social Work
    University of Toronto
    246 Bloor Street West
    Toronto, Ontario, Canada M5S 1A1

Admissions to Maternity Homes in Ontario. An examination of the admission patterns among the twelve maternity homes in Ontario over a six month period. The study examines the complete personal, and social characteristics of the women and their social helping networks. Methodology employs a standardized intake form administered upon intake.

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Scott, Deborah
    Research Associate
    Department of Psychiatry
    McMaster University Medical Centre
    1200 Main Street West
    Hamilton, Ontario, Canada L8S 4J9

Presently I am working with several others on a project, formally entitled "The Development of Measures of the Psychosocial Environment to Predict Change in Health Care Utilization." A description follows: Three measures of the psychosocial environment are chosen as predictors of health status change: life events (modified Holmes & Rahe Recent Life Change Questionnaire), locus of control (Rotter's I-E scale and Wallston & Wallstons' MHLC), and social support (instrument developed by one of the investigators). It is hypothesized that illness effects of life stress can be reduced or buffered by effective social supports (in terms of helpfulness) and cognitive style. The instruments are administered to a primary care population at six-month intervals over two years. Health status changes are measured by a daily health diary and data collected at the physician's office. The researchers include: A.H. McFarlane, G. Norman, R. Roy, D. Scott, & D. Streiner.

Smith, C.J.
    Department of Geography
    University of Oklahoma
    Norman, Oklahoma, U.S.A. 73019

Natural support systems in urban neighborhoods: A research proposal. The proposed research is an empirical exploration into the existence and operation of 'natural support systems' in several Oklahoma City neighborhoods. The study proposes to investigate the circumstances under which this support is provided, and the results can hopefully be used to make some suggestions about how to complement institutional services with their natural counterparts.

Snyder, W.L., Kobrzycki, P., Rosenzweig, J.
    U.S. Veterans Administration Hospital
    2215 Fuller Road
    Ann Arbor, Michigan, U.S.A. 48105

Grant Title: Examination of factors affecting health behavior.

Technical Summary: In a survey designed to identify factors associated with adherence to medical recommendations, in-center and home hemodialysis patients were categorized as adherent or non-adherent to diet and phosphate binder orders on the basis of clinical and laboratory values. Locus of control, self-esteem, futuristic orientation, knowledge of disease and treatment, stress of treatment and perceived social support were determined by questionnaire. Adherence was found to differ by duration of dialysis, the poorest rates occurring in the group on dialysis for more than one but less than three years. Adherers also perceived a greater level of social support. Controlling for locus of control, externals perceived both less social support and more stress from treatment than internals. Locus of control and self-esteem were found to be negatively correlated. Recommendations for provision of social support as a strategy for improving adherence are made.

Srole, L., Fischer, A.K., Singer, E.
    Columbia University
    School of Medicine
    Psychiatry
    630 W. 168th Street
    New York, New York, U.S.A. 10032

Grant Title: Program for research in psychiatric sociology.

Technical Summary: The Program is one year into the Midtown Manhattan twenty-year Restudy operation. Survivorship-mortality, locatability-unlocatability, geomobility-fixity are current life-outcomes being investigated on the entire 1953 sample of 1660 respondents, then age 20-59. Some 890 of the latter, now age 45-79, are accessible for reinterview on other life-outcomes: e.g., somatic morbidity, general mental health, anomia, depressive and latent suicide tendencies, alcohol, tobacco and drug abuse, role disabilities, use of social networks, and overall immunity-vulnerability to life traumas. 1953 baseline data and life changes intervening between 1954-1973 will be analytically searched for predictors of favorable and unfavorable life outcomes. It is hoped that the Restudy results will help enlarge the knowledge available to both preventive psychiatry and preventive medicine.

Tolsdorf, C.
    Clinical Staff Psychologist
    Children's Psychiatric Center Inc.
    Community Mental Health Center
    7 Globe Court
    Red Bank, New Jersey, U.S.A. 07701

I am currently investigating the networks and coping patterns of lower-income multiproblem families in a Community Mental Health Center.

Wellman, B. and Crump, B.
    Centre for Urban and Community Studies
    University of Toronto
    150 St. George Street
    Toronto, Ontario, Canada M5S 1A1

We are currently investigating the relationship of relational and structural variables to the provision of assistance in interpersonal networks. Variables being examined include type of relationship (e.g. parent / child), residential location of network members, frequency of contact, intimacy, network density and network centrality. The analysis is based on a random-sample survey of 845 residents of East York, Toronto. In addition, in-depth qualitative interviews with a cohort of these respondents will be analyzed in order to discern 10-year longitudinal changes in network relationships (particularly under conditions of residential mobility) and the interplay between network structure and network dynamics.

Wells, L., Dunlop, J., Singer, C., and Lambert, C.
    Faculty of Social Work
    University of Toronto
    246 Bloor Street West
    Toronto, Ontario, Canada M5S 1A1

Relocation and the Elderly. This study concerns a group of elderly persons who, due to the closure of their current residence (a home for the aged), will be transferred to several similar institutions. The major emphasis will be on describing patterns of group support via interpersonal networks. Using the resident as the anchorage point, we will determine the impact of relocation on the kinship sector, the friendship sector and the service or care giving sector and also monitor changes in physical and mental functioning and in life satisfaction of the individual residents.

Westermeyer, Joseph
    Department of Psychiatry
    University Hospitals
    Box 393
    Mayo Memorial Building
    Minneapolis, Minnesota, U.S.A. 55455

I have collected data on the social networks of Baa (insane) persons in Laos. I am currently in the process of writing up these data and expect that they will be published in time.

QUESTIONS CONCERNING THE APPLICATION OF MARXIST CONCEPTS TO THE ANALYSIS OF HUNTERS AND GATHERERS

Karen Anderson (Sociology, University of Toronto), Paper presented to the International Conference on Hunters and Gatherers, Paris, France, June, 1978.

Within the last fifteen years a number of scholars have attempted to elaborate the Marxian concepts of mode of production and social formation (socio-economic formation). Following the methodology of Capital they have provided theoretical explanations of modes of production other than the capitalist mode of production.

In general there are two distinct ways in which scholars have chosen to develop those concepts. Althussar and Balibar (1975) along with Hindess and Hirst (1975) have approached the problem as an exercise in logic, claiming that theories are not testable by reference to the facts. While the work of these theoreticians raises the question of the reproduction and transformation of social totalities it has little else to offer those who are concerned with explaining concrete social processes.

On the other hand there has been a considerable amount written by anthropologists such as Terray, Meillassoux, Godelier and others who attempt to analyze concrete societies using Marxian concepts. There is, however, little agreement between these authors over a number of important conceptual and theoretical issues. As of yet many questions concerning the elaboration of Marxist concepts and their application to the analysis of concrete social processes have not been satisfactorily answered.

This paper raises some of those questions within the context of my research on processes of change and transformation amongst Iroquoian and Algonquian peoples during the 17th and 18th centuries.

The North American Indian social formations serving as referents for the theoretical questions that will be raised all engaged in some form of hunting and gathering; either as their sole productive process or in combination with some form of agriculture. In the cases where agriculture was practiced in combination with hunting and gathering it took one of two forms. In some cases seeds were thrown into the ground in the spring and left to mature on their own to be harvested in the fall. In other cases settled agriculture was carried out, largely by women, while men engaged in hunting, trading, warfare et cetera.

My research on these social formations raises a number of issues: 1) what are the different forms of social organization associated with varying degrees of dependence on hunting and gathering, 2) what limitations does hunting and gathering place on the development of the relations and forces of production, 3) what implications did the intersection with European mercantilists and colonists have for these social formations, 4) what was the relationship that these formations bore to each other prior to and during the fur trade era.

My attempts to answer these issues within a Marxist framework has lead to the following questions concerning that framework - questions which do not as yet appear to have sufficient answers within the published literature.

DETERMINING THE MODE OF PRODUCTION

In my research I have looked at a number of different social formations which practiced varying forms of hunting and gathering. In all these social formations there appears to be some form or other of communal ownership of resources and some form of distribution of the social product through one or another form of kinship structure. Yet in spite of these similarities there are major differences between the complexity of organization of the several Iroquoian confederacies of the 17th century and the bands of Algonquian hunters and gatherers whose highest level of social organization was reached with summer gatherings for trade with European mercantilists.

The question can then be raised concerning the basis for the determination of the existence of a specific mode of production in social formations which are often lumped together as "primitive communist" or "hunters and gatherers". The question of what mode or modes of production exist in social formations where communal ownership of resources is prevalent and where social organization is 'egalitarian' has received inadeqate treatment. We can, I think, reject both Hindess and Hirst's notion of the "primitive communist mode of production" and Meillassoux's notion of a "hunting and gathering mode of production".

In the first case Hindess and Hirst lump together a large number of possible variations under the term "primitive communist mode of production" characterized by, they say, "a mode of communal appropriation of surplus-labour" (1975:23). This definition is so general that it is virtually useless for any scientific purposes. Meillassoux, on the other hand confuses productive processes with the concept of mode of production (1973:199). Thus he conflates two separable issues and obscures a third - the relation between a given mode of production and a particular productive process.

If we do not oversimplify the concept mode of production by attempting to mass together what are possibly vastly different categories, and if we do not confuse mode of production with productive processes then we are faced with a rather complicated task of determining what the actual mode or modes of production are that exist in 'egalitarian' kinship-dominated social formations. The question is how that task is to be accomplished.

THE RELATION BETWEEN PRODUCTIVE PROCESSES AND THE MODE OF PRODUCTION

Once we have determined what the mode of production of a specific social formation is we can then turn to the question of the relation between a specific mode of production and specific productive processes. Can we predict the form, if not the exact content of the relations and forces of production from the productive process that the members of a social formation engage in? Or, can we predict the productive processes that the members of a social formation can possibly engage in given the relations and forces of production?

The case of hunters and gatherers is particularly interesting in this context. Because they transform nature very little, because they (more or less) take what nature gives them, the question of the relationship of social organization to natural, i.e. ecological limitations becomes more of an issue than is the case in social formations where other productive processes are engaged in. Here nature can appear to determine the level of social complexity. But is this the correct formulation of the question?

I simply wish to raise here the issue of the most fruitful way to raise the question of the relation between mode of production and productive processes. How do we determine the limits that specific productive processes place on the development of the relations and forces of production; and how do we determine the limits that the relations and forces of production place on the development

of the productive process.

DETERMINING THE CORRECT UNIT OF ANALYSIS

In my research, this involves the question of the relation between those social formations where hunting and gathering is the sole productive process and those social formations where agriculture is of major importance. In the case that I am studying, Algonquian hunters and gatherers supply Huron agriculturalists with a large portion of their game and fur requirements. The Hurons, in turn, supply the Algonquians with corn sufficient to supply a large portion of their winter food requirements. The Algonquians and Hurons, although speaking different languages, practicing different ceremonies, possessing separate kinship structures and engaging in separate productive processes live together over the winter, engage in war against a common enemy (the Iroquois) together, and practice certain important ceremonies together.

For analytical purposes then, what do we consider as the unit of analysis, the Hurons and Algonquians separately or together?

This 'alliance' between hunters and gatherers and primitive agriculturalists raises a number of further questions; what is the relation between agriculturalists and hunters and gatherers who exchange with each other? Can exchange relations form the basis for the appearance of confederacies? Can exchange relations form the basis for the appearance of classes?

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MAN AND HIS ENVIRONMENT

Åke Daun (Department of Building Function Analysis, Royal Institute of Technology, Stockholm)

This research grant will be used for two projects entitled "Living conditions and social progress" and "The recreational patterns of teenagers in large urban areas and in the country", plus for directing three research projects entitled "Work and leisure", "Working women on estates of single-family houses" and "Mental health and quality of life research". There are also plans for fitting a project dealing with theory and methods, entitled "Oualitative Methodology", into the budget covered by the grant. The overall aim is to increase the degree of understanding of the conditions prevailing in the environment in which people live, work, spend their leisure time, acquire an education and training and receive care, medical or otherwise. Completion date: 1981.

The "Living conditions and social progress" project involves interviewing households which have moved away from a number of recently constructed new housing estates in the Stockholm area and households with second homes in various holiday home developments around Stockholm and on the West Coast of Sweden. The purpose of these interviews is to analyse people's life styles in industrial society as compared to life styles in bygone eras. Moving house today is a different proposition to what it was when working life had a greater influence on where and how people lived. Researchers are studying the social life of people and are trying to establish how an extensive network of social contacts means freedom for people to choose their company, leisure time occupations, consumer habits and other activities.

CHILDREN'S SOCIAL TIES

Maureen T. Hallinan and Nancy Brandon Tuma (Stanford University)

A longitudinal study of change in children's friendships funded by NIMH, with Maureen T. Hallinan and Nancy Brandon Tuma as principal invertigators, is in progress. The aim of the study is to identify individual characteristics of children and organizational properties of their classroom and school environments that affect the formation and stability of the children's friendships in the classroom. The children are in the fourth, fifth and sixth grades of several schools in California. The data include sociometric choices and classroom observations. Analysis of these data is still at an early stage.

Analysis of sociometric data from a pilot study revealed a number of interesting findings. The way children were grouped for instructional purposes was found to affect selection of friends and

stability of friendships (Hallinan and Tuma, 1977). Status characteristics such as sex and achievement (Tuma and Hallinan, 1977) also affected stability of friendships, though there were a surprising number of cross-sex friendships. In addition, being chosen by a student or friend had a strong positive effect on friendship choice. The large data set should eventually permit considerable network analysis.

In a study of the development of children's friendship cliques by Hallinan, the incidence of cliques was seen to increase with the age of the children through junior high school. A complete sex cleavage was found in all the cliques in 62 classes in the fourth through eighth grades. The size and structure of the classroom were seen to have a positive effect on the number of cliques in the class.

In a study by Felmlee and Hallinan (1978), the amount of interaction in the classroom was seen to have a negative effect on the incidence of asymmetric dyads and intransitive triads in a class. Hallinan (1976) found similar results and showed that the friendship patterns in open classes tended to be less hierarchized than in traditional classes.

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LIFE STRESS, PSYCHOSOCIAL BUFFERS AND HEALTH STATUS CHANGE

Deborah Scott (Department of Psychiatry, McMaster University Medical Center, Hamilton, Ontario)

The purpose of this study is to determine the extent to which life change events, cognitive style and social support systems predict alterations in health status. It is hypothesized that illness effects of life stress can be reduced or buffered by an effective social support system and cognitive style.

In Phase I, reliability and validity of a modified Holmes & Rahe Recent Life Change Questionnaire (RLCQ) and a Social Support Scale (SRS), developed by one of the researchers, were assessed and found to be statistically acceptable. A pilot study of 100 patients from a primary care population was initiated. In addition to the modified RLCQ and SRS, included are Rotter's I – E scale, Wallston & Wallstons' Multidimensional Health Locus of Control scale and Langner's 22-item psychophysiological scale. Health status change is measured by a Daily Health Diary, data collected at the physician's office, and seriousness of illness ratings.

In Phase II, 500 patients will be selected from various family practices. The design is longitudinal with instruments being administered at six-month intervals over two years.

NORTHERN CALIFORNIAN COMMUNITY STUDY

Claude S. Fischer (University of California, Berkeley)

The Northern California Community Study (also known as the Social Network Project) is designed to analyze the connections between attributes of communities on the one hand, especially urbanism, and attributes of individuals' personal networks. The centerpiece of the study is a survey, just completed (February, 1978), of 1,050 individuals' personal networks. (The survey instrument developed to measure egocentric networks is described in a paper summarized below.)

The Sample: 50 "localities" -:- census tracts and small towns - were sampled in the Northern California area, broken into five equal strata: Central City (S.F., Oak., Sacto.), Inner Suburbs, Outer Suburbs, Other Cities down to 10,000, and Towns down to 2500. Within each locality, approximately 20 interviews, on the average, were conducted. Excluded from the sample were predominantly Black tracts and non-English speaking respondents.

The interview covered: experience and attitudes vis-a-vis the town and neighborhood; local travel behavior; psychological measures; and, most importantly, measures of networks. These latter measures involved eliciting from respondents the names of people they interact with in a variety of ways, and then obtaining descriptions of those persons. Roughly 15 plus or minus 10 names were elicited from each respondent. This will allow us, we hope, to describe the egocentric networks in various ways.

At this writing, we are about to get the data "up". I anticipate initial reports this Fall, and a book manuscript next (Dec., 1979) Summer. The data will be released to the public, I hope, by Fall, 1979.

Papers from the Project include to date:

Claude S. Fischer "The Contexts of Personal Relations: An Exploratory Network Analysis." Working Paper # 281, Institute of Urban and Regional Development (IURD, 316 Wurster, UC, Berkeley, CA, 94720; $1.00).

This paper is based on the pilot survey data gathered during preparation of the final instrument for the Northern California Community Study.

Classic Decline-of-Community theories assume a certain connection between the contexts of personal relations and their qualities. This paper addresses the issues of whether (1) relations set in bounded, traditional contexts are more intimate and supportive than those drawn from voluntaristic settings; (2) whether education - as an indicator of modernism - is associated with having relations in voluntaristic contexts; and therefore (3) that education is associated with having less intimate and supportive ties. The data are drawn from two pilot surveys using a method of measuring networks that yields unusually rich descriptions of personal relations. The results tend to support the second proposition, but neither of the other two.

L.M. Jones and C.S. Fischer "Studying Egocentric Networks by Mass Survey." Working Paper # 284, Institute of Urban and Regional Development; $1.50.

This paper presents the technique the Northern California Community Study developed to measure Egocentric Networks quickly and efficiently by mass survey.

The paper discusses the following topics: What are the definitional issues that must be confronted in developing such an instrument? We adopted an exchange-based definition of "relation." Given a definition, what options are available for correctly (a) eliciting from respondents an accurate list of his/her network associates, and (b) describing those associates? We lay out in detail the questions and techniques we employed. (Appendices present all the items tried in two pilot surveys and presently used in the main survey.) The second half of the paper presents analyses of the data from the two pilots - analyses designed to point out the areas of reliability and unreliability in the method. This paper is intended to both (1) explain the methodology of the Northern California Community Study and (2) to be of use to other researchers planning network surveys of this kind.

C.S. Fischer "Urban-to-Rural Diffusion of Opinions in Contemporary America." Working Paper # 280, Institute of Urban and Regional Development; $1.00. A Revised and Abbreviated version of this paper is forthcoming as a research note in American Journal of Sociology, probably July, 1978.

Recent studies indicate continuing cultural differences between residents of urban and rural communities. This paper argues that these differences persist because they are constantly generated anew. Innovations emerge in larger places and diffuse from them to smaller ones, so that there is always a gap between the two. The model presented here predicts a specific pattern of diffusion over time. The model is evaluated with poll data, covering twenty years, on various social attitudes. Results are consistent with four derived hypotheses: that, (1) social attitudes are associated with community size; (2) the larger the community, the more likely a person is to hold that position which is gaining on the issue; (3) trends in intercommunity differences (narrowing or widening) vary systematically with the historical period of the opinion's diffusion; and (4) the specific parameters in the patterns of change are consistent with a diffusion model in which early adoption and/or rate of diffusion are positively associated with community size.

...NETWORK NOTEBOOK Continued from page 8.

Donald Schon, Beyond the Stable State. "A network is a set of elements related to one another through multiple interconnections. The metaphor of the net suggests a special kind 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..."

Anne Dosher, Networking: The Vision. "A network is a new mediating mechanism which can bring healing intervention between persons, groups, organizations, communities, and oppressive systems. With power equalized across all of the member nodes, it can be developed into a tough, resilient, enduring system.

Network organizers and builders are the pragmatic visionaries who function out of hope in the face of despair, dysfunction, and rigidity. We write down our visions in pragmatic documents which demand redistribution of resources, personalization and humanization of services, work for all, equity for all, and quality of life with meaning for all. For us there must be congruence between doing and being, theory and practice, between self and system.

Network designers are the creators of new futures in human services and communities, the model builders for future societies, members of a community of the mind. Visible to some, invisible to many,

THESIS SUMMARIES

FRIENDS, NEIGHBOURS AND KIN: DEVELOPMENT OF SOCIAL CONTACTS WITH SPECIAL REFERENCE TO STAGES IN THE LIFE CYCLE AND CLASS FACTORS

Tessa Cubitt (Geography, Portsmouth Polytechnic, England) University of Edinburgh Thesis, 1971.

This research was undertaken to examine the way that social networks are formed and change and the factors which influence these changes. The conjugal pair was taken as the focus of the network and married couples selected from a district of Edinburgh to form a research set. The project was carried out by means of a series of interviews with the members of the research set and participant observation.

The data suggested the following network characteristics. It was found that the main factor affecting network changes was the stage in the developmental cycle of the family. In the different stages of the developmental cycle, network recruitment was from different sectors. Thus in the first stage of the development cycle most network members were old childhood friends, in the second stage recruitment was mostly from the neighbourhood, in the third stage network members were recruited from voluntary associations and the work situation and in the final stage the network was made up mostly of kin. The results were similar for both the working class and the middle class members of the research set.

Social class was found to influence the way social contacts were made within the sectors, thus the way in which network links were formed differed between the middle class couples and the working class couples.

Another finding was that the networks of the research set were of low density, but that the density of the individual sectors was high. This suggests that urban married couples have low density social networks but that high density areas may be found in the sectors of the network.

Since the project showed that the stage in the developmental cycle of the family was largely responsible for the sectors from which recruitment to the network took place, it can be suggested that the high density areas of a social network are dependent on the stage in the family cycle of the conjugal pair. High density networks are likely to produce norm enforcing groups and therefore it seems that the stage in the developmental cycle is an important factor in influencing network changes and characteristics and also in determining in which sectors norm enforcing groups will exist.

STRESS, SUPPORT AND COPING AMONG FIRST YEAR DENTAL STUDENTS: A CORRELATIONAL ANALYSIS

Marc Goldstein (Case Western Reserve University School of Dentistry)

This research used a prospective design to investigate the role of social network support in helping individuals cope with stress. Near the start of the second semester, 63 first year dental students identified a subset of their social network: those who fit Boissevain's (1974) definition for membership in the personal, intimate and effective zones. Membership was limited to a maximum of ten persons per zone. For each member, S provided ratings on eleven specific support behaviors thought to reflect three underlying dimensions: instrumental support, emotional support and social activity/integration support. Information regarding network structure, dental school stresses, recent life changes and need for affiliation was also collected. Subsequently, data on a range of behaviors thought to reflect coping or failures to cope were collected for the balance of the semester. Eleven coping indices, such as drug use, academic performance and somatic symptoms, were constructed, and specific support dimensions and structural features were correlated with these indices.

The hypotheses under examination generally predicted that (1) network support would enhance coping, (2) high need for affiliation would correlate with higher reported levels of emotional and social activity/integration support, (3) high affiliative need Ss would have more frequent contact with network members and a larger proportion of peers in their network, (4) network zone density would correlate with the level of relationship intensity within the zone, and (5) higher levels of support would be associated with greater network density.

Preliminary factor analyses revealed that the data collected on the support behaviors within each zone segregated in a way consistent with the three assumed underlying dimensions. These resulting factors were used as the support variables in all subsequent analyses. Tests of the hypotheses, done separately by sex, revealed support for the first hypothesis for men and the second and fourth hypotheses for both groups. Contradictory results were found for the first hypothesis for women and the last hypothesis for both groups. Multiple regression analysis indicated that significant network support effects on coping remained after all other individual and stress variables were controlled.

It was concluded that the data provide evidence for the support-aids-coping hypothesis and that discrepancies arising from the female data may reflect both individual factors and institutional sexism. Need for affiliation was also seen as influencing Ss' reports regarding the quality of their network

interactions. A discussion of the methodological constraints of the study and directions for future applications and research were provided.

"GETTING SETTLED": A LONGITUDINAL STUDY OF THE EXPERIENCES OF NEWCOMER FAMILY MEMBERS IN CANBERRA

Wendy Jones (Sociology, Australian National University, Canberra) Australian National University Thesis, 1978.

Using a symbolic interactionist framework and fieldwork methods, this thesis investigates the experiences of the members of 30 newcomer families in Canberra, Australia, during 1976-77.

The study covers two main interests. First, particular attention is given to the adaptive processes common to all newcomers, which I call the newcomer career. These processes include: making and maintaining friends; making commitments to local activities; obtaining and giving help and support; and using and developing skills. Over the course of the families' first year in Canberra, I have tried to capture a significant segment of this newcomer career for analysis.

In addition, the study focuses on the newcomers' changing perspective on themselves, their family, their relocation and the local environment. The newcomers' close relationships with others are explored because of the potential of various others to affect the self-concept in new situations. The newcomer or stranger experience is used to explicate stability and change in the individuals' self-concepts which they attribute to others actually present, distant others seen infrequently though held in the imagination, societal models or the generalised other.

Through the investigation of this substantive area (the adaptation of newcomers), I attempt to clarify various aspects of the symbolic interactionist theoretical framework; reflexively, I use that theoretical framework throughout to understand these observations.

SOCIAL NETWORKS AND OCCUPATIONAL CAREERS

Stephen Radecki (Sociology, University of California, Los Angeles) Thesis, 1977.

Ethnographic research by Gans (1962) and Sennett and Cobb (1972) suggests that there is an inverse relationship between involvement in cohesive, communal-type social networks and individuals' ability to relate to the practical, instrumental concerns involved in full, effective participation in the occupational sphere of life. As reported in his book, The Urban Villagers (and in Fried, 1973), Herbert Gans (1962) was attempting to anticipate the social consequences of then-impending redevelopment in an established urban neighborhood (Boston's 'West End') by studying the day-to-day lives of the residents, and in particular to explain a peculiar lack of response to this long-planned eventuality on the part of those residents. He found that focusing on the residents' primary social relations not only shed light on both of the above, but also revealed the unique problems of a community attempting to adapt its non-urban institutions and culture to an urban milieu. Several of the most striking aspects of this were that involvement in communal social relations seem to be accompanied by a notable absence of a capacity for, need for, and interest in individual achievement, that the concept of a 'career' was virtually unknown and occupations evaluated according to the degree to which they did not require any real commitment on the part of the employee, and that occupational mobility was frowned upon by the communal group and would ultimately require the mobile individual to sever his ties with the group.

The study of Boston's West Enders is compelling in this respect, for it succeeds in establishing the idea that a high level of involvement in an occupational career, as well as a positive orientation toward prerequisites for successful adaptation to a career (such as the willingness to sever social ties if necessary), is facilitated in modern society through the absence of a "competing" commitment to a communal group and, therefore, that involvement in such groups may serve as an impediment to the individual's success in being able to relate to and deal with matters conducive to individual occupational mobility. Sennett and Cobb (1972) refer to this concomitant of close-knit primary relations as "the divide between achievement and fraternity" (1972:101), and find it manifested not only in work settings, but in school where a "shared sense of loyalty" within the peer group will tend to discourage a typical individual achievement which would elevate the individual from the group and thus have a divisive influence on group cohesion. This effect was found to carry over into the blue-collar work settings reported by their respondents, but in diminished form as individuals' primary ties became increasingly segmented in adult life. Given true communal social relations, this diffusion of primary ties and consequent diminution of this effect should not occur, as there will have been a pronounced continuity of primary ties into adult life, and thus a more or less continuous suppression of predilections toward individual aspiration, as was found in the West End.

Where allegiance to a communal group exists, then, one would expect the idea that the individual should engage in activities associated with social mobility to be de-emphasized in favor of a relatively greater emphasis on values more conducive to group cohesion and the maintenance of unimpeded social interaction among its members. Since mobility prerequisites such as vigorous attention to occupational concerns constitute "competing" commitments from the standpoint of the communal group, the promotion of expectations for individual status improvement could occur only at the risk of

undermining individuals' commitment to the group, and would therefore be expected to occur less often than in the case of individuals whose primary group affiliations are not of the communal type.

Given the fact that all of the available evidence for the divide between achievement and fraternity comes from ethnographic studies of predominantly Italian populations in Boston, the goal of the present study is to attempt to replicate these findings in a more representative working-class population using the more rigorous methods of survey research. Communal social relations will be defined in terms of seven dimensions of individuals' social networks - their extensity, intensity, duration, density, homogeneity, reciprocity, and activity level. These seven elements have extensive roots in social theory. The first, second, and third are based on Sorokin's (1937) modalities of social interaction, the fourth on work in social anthropology by Barnes (1954) and Bott (1971, c1957), the fifth on Simmel's (1964) study of affiliation webs, as refined by Laumann (1966; 1973), the sixth on Homan's (1950; 1974) parameters of social exchange, and the seventh on Epstein's (1961; 1969) concept of the efficacy of networks. In addition, the first four dimensions were employed by Guterman (1969) in constructing an "intimacy index" of social relations, the third, fourth, and fifth by Caplow (1955) as part of his theoretical development of the concept of "ambience" and by Suchman (1965) as his empirical definition of "friendship solidarity," the first, second, fourth, sixth, and seventh by Mitchell (1969) in his delineation of "social networks," and the first, second, sixth, and seventh by Granovetter (1973) in defining the "strength" of an interpersonal tie. Empirically, communal social relations will be defined as those which are high in intensity, density, and activity level, which are long in duration, extensive, reciprocal in friendship obligations, and ethno-religiously homogeneous.

This measure will be related to variations of widely-used measures of mobility orientation (see Reissman, 1953; Westoff et al., 1961; Wilensky, 1966; Seeman, 1977), powerlessness (see Rotter, 1966; Andrisani and Nestel, 1975), occupational mobility (see Duncan, 1961; Featherman et al., 1975), and orientation to work (see Centers, 1948; Rosenberg, 1957; Seeman, 1966; Kohn, 1969). The study, currently in progress, hypothesizes that involvement in communal social networks will be related to individuals' feelings of powerlessness, and inversely related to their aspirations for upward social mobility, their achieved occupational mobility, and their degree of identification with their work.

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SOCIAL AND SPATIAL CONSTRAINTS IN THE DEVELOPMENT AND FUNCTIONING OF SOCIAL NETWORKS: A CASE STUDY OF GUILDFORD

Robert L. Walker (Social Research Division, Department of the Environment, United Kingdom), London School of Economics, Thesis, 1974.

Social structure may usefully be conceptualised as consisting of persons linked together in a vast network of relationships. The personal networks of individuals may then be seen to serve as a primary resource giving, or constraining, access to secondary resources such as information, mutual aid and influence. These secondary resources in turn help determine the distribution of a wide range of social benefits.

Network resources (termed "sociometric wealth" in the thesis) relate both to the structure of personal networks and to the content of the component social relationships. As such they are only partially amenable to measurement by standard network measures. Nevertheless, at risk of over-simplification, the following network characteristics may be postulated as adding to a person's network resources: large size, large geographic $_1$ and social range, low density and, within the bounds of moderation, diffuse and strong relationships.^{1} Excessively strong or diffuse relationships tend to restrict freedom of action especially when associated with high density (which theoretically they are, Granovetter, 1973). Specific relationships may, on occasion, contribute to network resources such as when they serve as bridging links between dissimilar sets of individuals.

On the basis of evidence drawn from a wide range of sources (in particular, Firth, Hubert, and Forge, 1970; Klein, 1965), it was hypothesised that network resources are inequitably distributed within society and concentrated among those of higher class-position. This hypothesis was tested in relation to survey data gathered in Guildford(England) and an attempt made to explain the distribution of network resources in terms of a constraints model of individual behaviour.

METHOD

For any individual, at a given location in space and time, it is theoretically possible to define an opportunity set of actions the size of which indicates his degree of choice and is a function of the time-geographic and socioeconomic constraints operating on him (see also Walker, 1975, 1976). The characteristics of a person's network may be viewed as the outcome of a series of choices and subsequent actions and, correspondingly, the social distribution of network resources may be seen to result from different groups in the population making similar choices from within similarly constrained opportunity sets. The Guildford study concerned some of the social and spatial constraints on network development.

Less than 200 detailed interviews were possible because of limited financial resources. Consequently it was decided to try and minimise the effect of intervening variables and to maximise the possibility of finding differential social and spatial constraints. The former objective was achieved by adopting a matched-pairs research design and the latter, first by comparing skilled-manual workers with higher-professionals, and secondly, by locating the study in Guildford - a town characterised by high levels of both commuting (to London) and residential mobility.^{2}

A filter survey of 1,900 households was undertaken to select households for the matched groups. A 'drop and collect' survey design was employed and a response rate of 68% achieved. Information was collected on a wide range of socialising behaviour. The higher-professional and skilled-manual workers chosen for detailed interview were pair-wise matched on age, household composition and length of residence. Male heads of household were interviewed and a response rate of 83% achieved resulting in 2 groups of 68 individuals. Network information collected during the detailed interviews necessarily only to the first order zone of egocentric networks. Even so the interviews took on average 71 minutes to administer.

DISTRIBUTION OF NETWORK RESOURCES

The primary research hypothesis that network resources are inequitably distributed according to class - position was generally confirmed. The networks of the skilled-manual group were found to be smaller, denser, more restricted in geographic and social range and more limited in scope (i.e. the number of activity fields embraced by a network) than those of the higher-professionals. However, while in aggregate the differences were considerable, individual differences were often quite small. Furthermore, the measures used did not reveal that skilled-manual workers' networks were any more diffuse than those of the professionals or that, to any great extent manual workers modelled other relationships on kinship (for an approving view, see Phillips, 1969).

More specifically it was found that for the skilled-manual group, interaction with kin was invariably more important than interaction with friends. On average networks of effective kin were much larger than friendship networks, and the amount and range of transactional content were much greater. Both networks were characteristically dense and geographically restricted, with frequent face-to-face contact being an important pre-requisite for the maintenance of relationships. Within the kinship network, vertical linkages (i.e. between families of origin and of marriage) predominated. Spouses frequently had quite separate friendship networks.

Among the higher-professionals, contact with kin was usually less frequent than with friends and networks of effective kin were generally small. However, vertical linkages were strong and the networks socially and geographically extensive. Friendship networks were less extensive than the corresponding networks of the manual group and they were also much less dense. Half the friendships were likely to be suspended (i.e. highly valued but with a low level of contact) and many were found to embrace married couples .

The groups studied varied most with respect to acquaintanceship. Work-based acquaintance networks and those derived from formal associations tended to be much larger among the higher-professionals; indeed they were often absent among the skilled-manual group. As a rule neighbouring networks were similar despite marked differences in residential mobility.

The differences observed were sufficient to put the working class group at a marked disadvantage with respect to potential access to interpersonal and institutional assistance. In particular the analysis indicated that the different structures and content which characterize the various partial networks make them uniquely able to fulfill certain functions, but at the same time limits the ease with which partial networks may be substituted. Therefore the advantage of great network resources in one partial network may be offset by relative poverty in another. In Guildford the limited involvement of skilled-manual workers in formal associations and the restricted social range of their networks were found to severely restrict access to insitutionally provided aid.

FACTORS AFFECTING THE DISTRIBUTION OF NETWORK RESOURCES

Differences in income, education, career mobility and alienation were found to support an inequitable distribution of network resources between classes whereas experiences of intergenerational mobility and, to a lesser extent, of job satisfaction countered it. Geographic mobility was apparently neutral in its effect.

The extreme complexity of the relationships identified may be illustrated by reference to the effect of residential mobility and job satisfaction.

RESIDENTIAL MOBILITY

Higher-professionals were much more likely to have experienced residential mobility than were the skilled-manuals but whereas mobility had only a marginal effect on the networks of the former group, even a move within Guildford was likely radically to reduce the network resources of a skilled manual worker.

The professionals in fact had a remarkable ability to overcome constraints imposed by mobility which was made possible by their use of formal means of communication that effectively reduced the costs of distance to negligible proportions. Unlike the skilled-manuals who would travel long distances to maintain face-to-face contact, the professionals were prepared to remain in touch solely by letter or, less frequently, by telephone. Inevitably this meant that the socialising component of relationships was limited but the professionals still mobilized their networks for advice, financial assistance and, particularly in the case of distant kin, for active practical assistance when it was required at times of crisis. In effect the professionals overcame the constraints of residential mobility by practising what might be termed the art of 'psychic mobility'. As a consequence mobility actually added to the professionals' resources by increasing the geographic dimensions of their networks and thus extending their 'action space'.

Friendship networks were actually larger among migrant professionals than among non-migrants although this seemed to be linked to differing experiences of social mobility and to varying levels of occupational aspirations rather than to residential mobility per se. Finally, contrary to expectations (e.g. Fellin and Litwak, 1963), the instrumental nature of neighbouring did not result in new

relationships rapidly in being formed to replace old ones disrupted by mobility; neither was there any evidence that neighbouring superseded other role-relationships in areas of high mobility. In fact the rapidity with which a person's neighbouring adjusted following a move depended, more than anything else, on the characteristics of the neighbouring networks in the locality of in-migration.

JOB SATISFACTION

The relationship between the level of network resources and job satisfaction was found to be equally complex. The study showed that both the intrinsic and extrinsic characteristics of the professional work-role were more conducive to job satisfaction and to the development of work-based relationships than those associated with skilled-manual occupations. However the number of professionals who, in practice, found their work to be highly satisfying was only a little greater than the number of skilled-manual workers. Moreover, while among the latter group job satisfaction was associated with greater network resources, professionals with high job satisfaction were characterized by relatively restricted networks outside work.

The conditional relationship between network size and job satisfaction was interpreted in terms of the prior orientations which respondents held towards work. Professionals were held to expect self-realization and fulfilment from their job with skilled manuals seeing work primarily as a means to external ends. If a professional found his job satisfying in itself, as he had been led to expect, then it usually resulted in a deep involvement and commitment to work with the relative exclusion of non-work relationships. If, on the other hand, a professional did not find satisfaction, then he would seek compensation outside the work role, in formal associations and/or the wider community, developing his network as a consequence. Contrarily, the skilled-manual worker who found work satisfying did so because it made possible relationships indexed by a larger number of out-of-work friends. His dissatisfied peer was prevented from finding leisure rewarding and so retracted into the small circle of kin and friends that traditionally characterizes the alienated worker.

DISCUSSION

While the study demonstrates the value of the network resource concept, measurement was restricted to resources occurring within the primary zone of personal networks. A full evaluation of network resources would need to take account of resources found in higher order zones which would allow the use of the structural postulates of network theory that were to a large extent omitted from the study. Moreover even the measurement of primary network resources was only partial since the true value attaching to a link in the primary zone is dependent upon links incident to it in the secondary zone. Also, as no information was obtained from the respondents' contacts the asymmetry of links could not be assessed and neither could the 'real', as opposed to the perceived, resource value be judged. However while the study was clearly deficient in these respects a fuller empirical treatment would necessitate considerably greater resources - the size of the average professional's secondary network zone in Guildford was 702.

Time was another important element neglected in the study. Within set constraints individuals deliberately expand and contract their networks to accomplish personal goals - a useful contact may later become an embarrassment. Likewise mobilization of a network will inevitably alter its resource value - asking a person once may make it easier or harder to ask him again. Unfortunately because of the high cost of serial research it may be inevitable that systematic research in this area will be restricted to small scale studies.

Finally, in the Guildford study, class-position was employed largely as a surrogate for the constraints operative on a person and on the development of his personal network. However a more fundamental consideration may be the extent to which networks are important in perpetuating status and class stratification systems. Clearly at the most fundamental level many of the presumed characteristics of status stratification systems can only survive if the occupants maintain differential association with members of their own social stratum. Also, in as much as power may be defined as the potential for successful influence, network resources are clearly an important component of the class structure. Members of the middle and upper classes can readily mobilize their wide ranging networks to maintain, and promote, their social and economic status. On the other hand the small dense networks of the working class are inimical to the intrusion of new ideas and information, restrict access to society's bureaucratic gate-keepers and limit movement to, and knowledge concerning, other social strata. In this way, by conceptualising social networks as personal resources, it may eventually prove possible to link the 'personal' and 'categorical' modes of explanation[3] and in so doing provide a richer understanding of society.

Notes:

1. The chosen definition of network resources emphasizes access to secondary resources that determine the distribution of other benefits - especially those of a material nature. As such, it largely ignores the personal significance of such factors as stability and security which may be present in small, dense networks (see Boissevain, 1974).

2. Guildford is situated 35 miles south-west of Central London and has a population of about 57,000.

3. J. Clyde Mitchell (1973) defines three orders of social relationships: the structural, categorical and personal.

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COMPUTER PROGRAMS

INTERLINK: A PACKAGE FOR THE CREATION, MAINTENANCE AND EXPLORATION OF LARGE SPARSE NETWORKS WITH DIFFERENTIATED NODE AND LINK TYPES. VERSION 2.2 (1)

David C. Bell (University of Houston)

INTERLINK is a program for the analysis of large social networks. INTERLINK aids the user in the creation and maintenance of a database file, and in the tracing of paths through the database.

A network is seen as a finite set of points ("nodes") connected by lines or arrows ("links"). INTERLINK allows the user to distinguish up to 7 types of nodes and up to 15 types of links. Each node contains information on its "name" and on its location in an alphabetic and an ID number list for its node type; there is sometimes quantitative information about the node as well. Each link contains information about the identity of its destination node (it is thus directional)(2), about the type of relation, and about the strength of the relationship.

Currently implemented node types are sectors, corporations, executives, and committees. Currently implemented link types are employment, campaign contributions, "equivalence", client, interlock, social, political, business, investment, family, and voluntary membership.

INTERLINK allows the user to read in data to build a database and to create new nodes and links in an existing database. The user may combine nodes and add new information to existing nodes and links.

INTERLINK allows the user to trace paths through the database. A path is specified as a sequence of node types and related link types. For each node or link in the sequence, a single value or a range of values may be specified for each variable in the node or link(3). A numerical count is given of the number of links from each start node to each end node. In addition the user may output some or all of the values of each node and/or link in the path.

Notes:
1. This package was initially written for the Univac 1108 by Thomas Shinnick and Walter Kemmerer III. This version, for the Honeywell 66/60, contains revisions and extensions by David C. Bell.
2. Although links are stored in directed form, they may be analyzed as either directed or nondirected links.
3. This feature allows the user to limit consideration to one or several nodes (e.g., sectors 180-195; or executives whose names begin with "s") or links (e.g., forward links; or vice presidents of firms; or campaign contributions in the range $500-$1500).

Gary Haggard "Nonorientable Genus of Subgraphs of K 7."
Gert Sabidussi (Universite de Montreal) "Variations on Harary's Interpolation Theorem."
Joel G. Stemple (Queens College, CUNY) "Geodetic Graphs Homeomorphic to a Complete Graph."
Vera Pless (University of Illinois) "When is a Cycle an Information Set?"
Ove Frank (University of Lund) "Moment Properties of Subgraph Counts in Stochastic Graphs."
Michel L. Balinski (School of Organization and Management, Yale University) "The Apportionment Problem."

NEW BOOKS

Locke, Ralph G. and Michael C. Howard. 1978. Structure, Identity and Action: Social Networks in Australian Society. Perth: University of Western Australia Press.

Contents:

I   THEORY AND METHODOLOGY
1. Alden Klovdahl, "Urban Social Networks: Some Methodological Problems and Possibilities."
2. Ralph G. Locke, "Interpretative Methods in Social Network Analysis."

II STRUCTURE, IDENTITY AND ACTION IN URBAN SETTINGS
1. Cecily Gribben, "Social Networks and Emergent Properties of Housing Commission Estates."
2. Patrick Mullins, "Network Structure and Political Mobilisation: The Case of a Brisbane Urban Social Movement."
3. Wendy Jones, "On the Reflexive Relationship Between Self and Social Network: The Study of Faculty Wives."
4. Ralph G. Locke, "The Structure of Action in an Urban Cultic Network."

III STRUCTURE, IDENTITY AND ACTION IN ABORIGINAL SOCIETY
1. Michael C. Howard, "Welfare Provision and Political Networks: The Case of South-West Aborigines."
2. Klaus-Peter Koepping, "The Limitations of Network Analysis for the Study of Value Systems: The Case of an Aboriginal Community."
3. Susan T. Woenne, "A Simple Crime Like Murder: Aborigines in a White Court Context."

Capobianco, Michael and John Molluzzo. 1978. Examples and Counterexamples in Graph Theory. New York: Elsevier North Holland.

The book is a compiliation of some 500 examples and counterexamples in graph theory. Many of these are associated with theorems, which are also stated. There is an extensive list of references, a list of symbols, and a comprehensive glossary.

Contents:

Forward: Gary Chartrand
1. Colorings: Point Colorings, Line Colorings, The Total Chromatic Number, The Achromatic Number.
2. Connectedness
3. Independence and Coverings
4. Extremal Problems: Ramsey Numbers, Generalized Ramsey Numbers, Other Extremal Problems.
5. Graph Valued Functions: Introduction, Line Graphs, Total Graphs, Entire Graphs, Sums and Products of Graphs, Some Handy Tables.
6. Groups: The Automorphism Groups of a Graph, Symmetry in Graphs, Graphs with Given Group and Properties.
7. Topological Questions: Introduction, Planar Graphs, Outerplanar, Graphs, Nonplanar Graphs.
8. Graph Reconstruction: Introduction, The Original Reconstruction Problem, Reconstruction from Non-Isomorphic, Point-Deleted Subgraphs, Reconstruction from the Collection $G - v_i$ where v_i is a Pendant Vertex, The Line Reconstruction Problem, Reconstruction from n-point-deleted Subgraphs, Reconstruction of Partially Labeled Graphs, Miscellaneous Questions.
9. Traversability: Eulerian Graphs, Hamiltonian Graphs, Traversability of Line and Total Graphs, Detours.
10. Miscellany: Sequences, Girth, Circumference, Diameter, Radius, Isometric Graphs, Trees and Cycles, Matrices, Intersection Graphs, The Geometric Dual.

Tilly, Charles. 1978. From Mobilization to Revolution. Reading, Massachusetts: Addison-Wesley.

Contents:

1   INTRODUCTION
The Stuff of Collective Action; Studying Collective Action; The Components of Collective Action; Groups, Events, and Movements; What You Will Find Here.

2   THEORIES AND DESCRIPTIONS OF COLLECTIVE ACTION
Marx on 1848; Durkheim; The Durkheimian Tradition; Mill and the Utilitarians; Collective Choice; Strategic Interaction; Mill and Pseudo-Mill; Weber; Social Movements; Marxian Analyses Since Marx; The Collective History of Collective Action; Our Task.

3   INTERESTS, ORGANIZATION, AND MOBILIZATION
     The Elementary Models; A Simple Account of Collective Action; Interests; Organization; Mobilization;
     Measuring Mobilization; General Conditions for Mobilization; From Mobilization to Collective Action;
     The Detection and Measurement of Collective Action.

4   THE OPPORTUNITY TO ACT TOGETHER
     From Mobilization to Opportunity; Repression and Facilitation; Repressive and Tolerant Governments;
     Power; Parties; Interests; Interactions; The Measurement of Power; Power and Polity Membership;
     Detecting Changes in Polity Membership; Opportunity/Threat; The Interplay of Mobilization and
     Opportunity.

5   CHANGING FORMS OF COLLECTIVE ACTION
     The Forms of Contention; Repertoires of Collective Action; A Case in Point: The Strike; Elections,
     Demonstrations, and Political Systems.

6   COLLECTIVE VIOLENCE
     British Brawls as Collective Violence; Violence: Concept and Reality; Some Lineaments of Violence;
     Violence in America; Political Action and Involvement in Violence; Changing Contexts for Collective
     Violence.

7   REVOLUTION AND REBELLION
     Revolutionary Situations and Revolutionary Outcomes; Revolutionary Situations; Revolutionary Out-
     comes; Situations and Outcomes Combined; Proximate Causes of Revolutionary Situations; Alternatives
     to the Existing Polity; Acceptance of Alternative Claims; Governmental Inaction; Proximate Causes
     of Revolutionary Outcomes; Coalitions Between Members and Challengers; Control of Substantial Force;
     Revolutionary Sequences and Collective Violence; Revolutionary Outcomes and Further Structural
     Changes.

8   CONCLUSIONS AND NEW BEGINNINGS
     Back to the Eighteenth Century; Theorizing about Collective Actions; The Importance of History;
     The History of Collective Action in Modern France; A Last Case in Point: Rural Collective Action
     in Burgundy.

Evan, William M. ed. 1978. *Interorganization Relations: Selected Readings*. Philadelphia: University
of Pennsylvania Press.

Contents:

I   MODELS OF INTERORGANIZATIONAL RELATIONS
     1. Almarin Phillips, "A Theory of Interfirm Organization."
     2. Oliver E. Williamson, "A Dynamic Theory of Interfirm Behaviour."
     3. Robert Axelrod, " A Coalition Theory Based on Conflict of Interest."
     4. Peter M. Blau, "Social Exchange Among Collectivities."
     5. Talcott Parsons, "Three Levels in the Hierarchical Structure of Organization."
     6. William M. Evan, "An Organization-Set Model of Interorganizational Relations."

II   RESEARCH ON INTERORGANIZATIONAL RELATIONS: TYPES OF LINKAGE MECHANISMS
     7. Peter C. Dooley, "The Interlocking Directorate."
     8. Jeffrey Pfeffer, "Size and Composition of Corporate Boards of Directors."
     9. Gordon B. Baty, William M. Evan and Terry W. Rothermel, "Personnel Flows as Interorganizational
         Relations."
     10. Paul M. Hirsch, "An Organization-Set Analysis of Cultural Industry Systems."
     11. Michael Aiken and Jerald Hage, "Organizational Interdependence and Intra-Organizational
         Structure."
     12. John E. Schwarz, "Maintaining Coalitions."
     13. Henry Assael, "The Political Role of Trade Associations."
     14. Lucretia M. Dewey, "Union Mergers."

III RESEARCH ON INTERORGANIZATIONAL RELATIONS: TYPES OF NETWORKS
     15. Herman Turk, "Interorganizational Networks in Urban Society."
     16. Jerzy J. Wiatr, "Political Parties and Interest Representation in Poland."
     17. Robert Perrucci and Marc Pilisuk, "The Interorganizational Bases of Community Power."

IV   STRATEGIES FOR RESEARCH ON INTERORGANIZATIONAL RELATIONS
     18. J. Clyde Mitchell, "The Concept and Use of Social Networks."
     19. Robert C. Anderson, "A Sociometric Approach to the Analysis of Interorganizational Relation-
         ships."
     20. David Stone, "Input-Output Analysis and the Multi-Product Firm."
     21. Kalman J. Cohen and Richard M. Cyert, "Simulation of Organizational Behaviour."
     22. William M. Evan, "The Organizational Experiment."

V   DESIGNING AND MANAGING INTERORGANIZATIONAL SYSTEMS
     23. Louis W. Stern, "Managing Conflicts in Distribution Channels."
     24. Richard A. Posner, "A Programme for the Antitrust Division."
     25. Louis W. Stern and C. Samuel Craig, "Interorganizational Data Systems."

Lomnitz, Larissa Adler. 1977. Networks and Marginality: Life in a Mexican Shantytown. San Francisco:
Academic Press.

     This book, a revised translation of Cómo Sobreviven los Marginados? (Siglo XXI, Mexico City, 1976),
presents a detailed study of the social and economic structure of Mexico City shantytown based on re-
peated house-to-house surveys and an extended period of participant observation. Using a combination of
anthropological and sociological field methods, the author demonstrates that migration patterns, resi-
dential patterns, and occupational patterns all point to the overriding importance of social networks as
an underlying mechanism of economic survival. These networks, formed among families of immediate or
close neighbors, generate a minimum level of economic security through the reciprocal exchange of goods
and economically valuable services on a day-to-day basis. Spatial and social proximity, as well as
equality of economic wants, are important factors in the process of formation and disintegration of
reciprocity networks, in conjunction with a psychological factor, *confianza*, which measures the relative
readiness of two partners to engage in reciprocal exchange. These findings are discussed in the general
framework of the economic and social evolution of Mexico, with particular attention to the effects of
industrialization, rural-urban migration, and the differentiation of the urban poor into an industrial
proletariat and a marginal sector having no access to the urban industrial economy.

Contents:

Forward: Eric R. Wolf
1   INTRODUCTION
     Some Preliminary Findings; A Design for Survival; City and Countryside in Latin America; An Eco-
     logical View of Migration; Urban Growth and Shantytowns; A Theory of Marginalization.

2   THE SETTING
     Mexico: Urbanization and Growth; Underemployment in Mexico; Mexico City: An Overview; Low-
     Income Housing in Mexico City; Cerrada del Cóndor; Some Impressions of Shantytown Life.

3   MIGRATION
     An Ecological Model of the Migration Process; Migration Processes in Latin America; A Historical
     Sketch of Migration in Mexico; Migration and Cerrada del Cóndor.

4   SHANTYTOWN ECONOMY
     Cerrada del Cóndor: Occupational Structure; Unpaid Family Labor; Economic Levels; Occupation and
     Economic Level; Income and Economic Level; Housing and Property Ownership in Cerrada del Cóndor;
     Material Belongings; Economic Level and Life-Styles; Schooling and Economic Levels; An Informal
     Rotating Credit Institution: Tanda; Summary and Conclusions.

5   FAMILY AND KINSHIP
     Marital Roles; The Nuclear Family; The Household: Definition; Types of Households; Some Compari-
     sons of Households; The Residential Pattern; Kinship; Relatives in the Country.

6   NETWORKS OF RECIPROCAL EXCHANGE
     Classification of Reciprocity Networks; Networks in Cerrada del Cóndor; Analysis of a Residential
     Complex: Pericos Court; Networks and Kindreds: The Villela Macronetwork; Networks and Kinship.

7   COMPADRAZGO
     Compadrazgo in Cerrada del Cóndor; Some Conclusions on Compadrazgo in Cerrado del Cóndor.

8   FORMAL AND INFORMAL ASSOCIATIONS
     Cuatismo; Local and National Associations.

9   RECIPROCITY AND CONFIANZA
     What is Reciprocity? Scales of Reciprocity in Cerrada del Cóndor; Confianza: A Variable of Reci-
     procal Exchange; Confianza and Exchange in Cerrada del Cóndor; Patron-Client Relations: The
     Cacique; A Final Note on Forms of Exchange.

10. CONCLUSIONS
     Some Basic Concepts; Networks; Living in Cerrada del Cóndor; The Future of Reciprocity.

Harvard-Yale Preprints in Mathematical Sociology, Department of Sociology, Yale University, New Haven,
Connecticut. (Order each paper separately)

1   Paul R. Levitt. 1976. "The Mathematical Theory of Group Selection, III, Stability Analysis of
     Fixation Solutions of a Partial Differential Operator by the Moment Space Method of Levins."

2   Harrison C. White and Scott A. Boorman. 1977. "Mathematical Models of Social Structure and Process."
3   Phipps Arabie and Scott A. Boorman. 1977. "Constructing Blockmodels: How and Why."
4   Scott A. Boorman. 1977. "Mathematical Network Models for Cooperative Hunting Partnerships."
5   Ronald L. Breiger. 1977. "Toward an Operational Theory of Community Elite Structures."
6   Francois Lorrain. 1977. "An Algorithm for the Computation of the Joint Homomorphic Reduction (Greatest Lower Bound) of Two Finite Semigroups Having the Same Generator Set."
7   John L. Defany. 1978. "Network Dynamics for the Weak Tie Problem: A Simulation Study."

COURSE OUTLINES

SOCIAL NETWORK PRINCIPLES IN CONTEMPORARY PROFESSIONAL PRACTICE

David W. Trimble (Society for Family Therapy and Research, Problems in Living Institute, Salem, Mass.) Spring, 1978 (10 Month Course).

This course is designed to acquaint the human service practitioner with the fields of clinical social network intervention and scientific social network analysis. Emphasis will be on deriving principles from these fields, principles which can be applied to daily human service practice.

1. INTRODUCTORY SESSION: Presents a review of the course, a brief review of the range of contemporary social network intervention techniques, and introduces the students. Each student will describe his/her practice and objectives for the course.

2. THE FULL-SCALE NETWORK ASSEMBLY: Session begins with students filling out an Attneave network map. These will be assembled by the instructor for a later meeting. The technology of the full-scale assembly, including the six stage spiral model and the concept of retribalization, will be discussed. The fourfold system of network conduct, based on the Attneave-Rueveni-Speck approach and evolved by the instructor in Lynn, will be presented.
    Readings: Speck and Attneave, 1973; Rueveni, 1977; any articles by Attneave, Rueveni, Speck.

3. SMALLER SCALE ASSEMBLIES: Session begins with the Curtis Primary Relationship Rating. This session will review Garrison's network session and Curtis' team problem solving techniques.
    Readings: Garrison, 1976; Curtis, 1973; any articles by Curtis, Garrison, Callan et.al.

4. OTHER TECHNIQUES: Session begins with the Pattison Psychosocial Network Inventory. This session will review the concept of ecological system intervention, and discuss Pattison's case decription (1973) as an example of complex organizational-network intervention. Attneave's participant intervention and the Johnson-Lenz information feedback strategy will be discussed. The instructor will present Survival Tribe, a Lynn innovation combining group and social network therapy approaches.
    Readings: Auersweld, 1968; Pattison, 1973; Attneave, 1969; Johnson-Lenz, 1977.

5. COMMUNITY NETWORK INTERVENTION: Session begins with the Todd map. This session discusses the professional as partner, co-equal, and consultant to naturally gathered supportive networks and to "natural neighbors". The Friendship Club of Lynn will be discussed as a self-generated network.
    Readings: Collins and Pancoast, 1976; Howell, 1975.

6. NETWORK MAPPING: Students' maps will be returned, and this session will be devoted to comparison of the practical features of the four measurement instruments. Students will be expected to report on their experiences helping clients map their networks.
    Readings: Attneave, 1976; Pattison, 1976.

7. SOCIAL NETWORK ANALYSIS: In this session we will try to get an overview of the academic field of social network analysis. Students appointed will be expected to be familiar with Connections - a bulletin-newsletter of the International Network for Social Network Analysis.

8. REVIEW OF NETWORK PRINCIPLES AND OF CHANGES IN STUDENTS' PRACTICE: All students will participate in discussing the changes in our practice since the beginning of the course. We will try to condense from our discussions a set of practical principles for use in direct service, education and consultation.

Reading List:

Attneave, C.L. 1973. "Social Network Intervention in Time and Space." in The Group as the Agent of Change, edited by Jacobs, et. al. Behavior Books. Discusses the six-stage spiral sequence model of network intervention process.

Attneave, C.L. 1969. "Therapy in Tribal Settings and Urban Network Intervention." Family Process 8: 192-210. Describes the role of a psychologist as a "participant intervenor" in naturally occurring social netowrks.

Attneave, C.L. 1976. "Y'All Come! Social networks as the unit of intervention." in Family Therapy -
Theory and Practice, edited by Guerin. New York: Gardner Press. A recent review of social net-
work theory and network intervention practice. Includes a guide for the use of Attneave's network
map, which may be ordered from Carolyn L. Attneave, Ph.D., 5206 Ivanhoe Place N.E., Seattle,
Washington, 98105.

Auersweld, E.H. 1971. "Families, Change, and the Ecological Perspective." Family Process 10: 263-280.
Describes an ecological frame of reference for understanding the context of families and their net-
works.

Auersweld, E.H. 1968. "Interdisciplinary Versus Ecological Approach." Family Process 7: 202-215. More
discussion of the ecological approach, grounded in a fascinating case discussion. More of Auersweld
can be found in the introduction to Hoffman and Long (below).

Barnes, J.A. 1972. "Social Networks." Addison-Wesley Modular Publications, Anthropology Module # 26.
Barnes is one of the social anthropologists who pioneered in the development of the concept of soc-
ial network. This paper reviews scientific inquiry into the human social network.

Bott, E. 1968. Family and Social Network (second edition). London: Tavistock. Bott's study of the soc-
ial networks of British urban couples provided the inspiration for clinicians to borrow the term
"social network" from the social sciences.

Callan, D., J. Garrison and F. Zerger. 1975. "Working with the Families and Social Networks of Drug
Abusers." Journal of Psychedelic Drugs 7: 19. Describes the adaptation of Garrison's network
session approach to residential treatment for drug abusers.

Collins, A.H. and D.L. Pancoase. 1976. Natural Helping Networks: A Strategy for Prevention. Washington:
National Association of Social Workers Publications. Discusses the development of consulting rel-
ationships between professionals and "natural neighbors" in a variety of populations.

Connections: Bulletin of the International Network for Social Network Analysis. Write to Barry Wellman,
INSNA; Centre for Urban and Community Studies; 150 St. George Street; University of Toronto;Toronto,
Ontario, Canada M5S 1A1. $8/3 issues. Lively and informal in parts, elsewhere laden with abstracts
(often of yet to be published articles). An excellent access link to networkers in scientific and
academic pursuits.

Curtis, W.R. 1975. "Community Human Service Networks; New Roles for the Mental Health Worker." in
Beyond Clinic Walls, edited by Tulipan, Attneave, and Kingstone. University of Alabama Press. Em-
phasizes reorganization of human services in order to integrate formal and informal helpers along
neighborhood lines.

Curtis, W.R. 1976. "From State Hospital to Integrated Human Service System: Managing the Transition."
Health Care Management Review (Spring): 39-50. Describes the reorganization of the Taunton-Lakeville
Area, Massachusetts Department of Mental Health, from a state hospital base to a network of neigh-
borhood service centers. This reorganization provided the context for the development of team
problem-solving (Curtis, below).

Curtis, W.R. 1973. "Team Problem-Solving in a Social Network." Psychiatric Annals (July). Describes a
network intervention approach, using trained volunteers, developed in the Taunton-Lakeville Area.

Erickson, G.E. 1975. "The Concept of Personal Network in Clinical Practice." Family Process 14: 487-498.
A very useful review of social network intervention approaches for the clinical practitioner.

Garrison, J.E. 1976. "Network Methods for Clinical Problems." Paper presented at the symposium,
"Clinical Group Methods for Larger Social Systems" at the Thirty-third Annual Conference of the
American Group Psychotherapy Association, February, in Boston, Massachusetts. The best single
source on the Garrison network session technique.

Garrison, J.E. 1974. "Network Techniques: Case Studies in the Screening-Linking-Planning Conference
Method." Family Process 13: 337-353. An early formulation of Garrison's approach, including case
descriptions. Like the AGPA paper, it provides a good discussion of the theoretical bases of
the networ session technique.

Garrison, J.E. and J. Howe. 1976. "Community Intervention with the Elderly: A Social Network Approach."
Journal of the American Geriatrics Society 24: 329-333. Presents a case study of the use of
Garrison's network session with the social network of an elderly client.

Garrison, J.E., C. Kulp and S. Rosen. 1977. "Community Mental Health Nursing: A Social Network
Approach." JPN and Mental Health Services (January): 32-36. A dramatic case study of a network
session with a difficult case in community mental health practice.

Gatti, F. and C. Colman. 1976. "Community Network Therapy: An Approach to Aiding Families with Troubled
Children." American Journal of Orthopsychiatry 40: 608-617. An important current source for the
term "community network therapy." Illustrates what we will call "navigation and weaving."

Gaylin, Jody. 1977. "You are Cordially Invited to Help Save a Life." Psychology Today (March):108-123. Describes Uri Rueveni's full-scale network assembly practice in Philadelphia.

Hoffman, L., and L. Long. 1969. "A Systems Dilemma." Family Process 8: 211-234. Introduced by E.H. Auersweld, this article provides a detailed case description which illustrates the problems of conventional human service approaches to the multiple-problem family.

Howell, M.C. 1975. Helping Ourselves: Families and the Human Network. Boston: Beacon Press. Directed to professional and layperson alike, this book calls for a transformation of human services to the scale and flexibility of the informal human social network.

Johnson-Lenz, P. and T. 1977. "On Facilitating Networks for Social Change." Connections 1, No.2: 5-11. Describes a strategy for feeding information about itself back into a network, using computer assisted technology to provide a model of a network's shared value orientations.

Pattison, E.M. 1973. "Social System Psychotherapy." American Journal of Psychotherapy 18: 396-409. Reviews a number of contemporary approaches to psychotherapy with units of intervention transcending the boundaries of the conventional family. Provides a frame of reference, "open" versus "closed" models of therapy, for selecting appropriate treatment strategies for particular cases.

Pattison, E.M. 1976. "A Theoretical-Empirical Base for Social Systems Therapy." Paper presented at the Thirty-third Annual Conference of the American Group Psychotherapy Association, in the symposium, "Clinical Group Methods for Larger Social Systems", in February, at Boston, Massachusetts. The most comprehensive statement of Pattison's work.

Pattison, E.M., et.al. 1975. "A Psychosocial Kinship Model for Family Therapy." American Journal of Psychiatry 132: 1246-1251. Pattison has made a monumental review of the literature relevant to social networks, has developed a clinical network intervention approach, and conducted research on the social networks of clinical populations. This is one of several comprehensive papers.

Rueveni, U. 1977. "Family Network Intervention: Mobilizing Support for Families in Crisis." International Journal of Family Counselling (December). Provides material which is developed more fully in Rueveni's forthcoming (October, 1978) book, Networking Families in Crisis.

Rueveni, U. (forthcoming) "The Family Therapist as a System Interventionist." International Journal of Family Therapy. Rich with details about conducting strategies for the full-scale assembly. Many case descriptions, including the Lynn Network Conference simulation.

Rueveni, U. 1975. "Network Intervention with a Family in Crisis." Family Process 14: 193-204. Case study description of Rueveni's practice using the full-scale network assembly.

Rueveni, U. and M. Wiener. 1976. "Network Intervention of Disturbed Families: The Key Role of Network Activists." Psychotherapy: Theory Research and Practice 13: 173-176. More of Rueveni's important emphasis on the activists who maintain support committees.

Speck, R.V. 1967. "Psychotherapy of the Social Network of a Schizophrenic Family." Family Process 7: 208-214. This article describes Speck's pioneer venture, which led to the development of the full-scale family network assembly.

Speck, R.V. and C.L. Attneave. 1973. Family Networks. New York: Vintage Books. The single most important source on the technique of full-scale family network assembly, developed in Philadelphia.

Speck, R.V. and C.L. Attneave. 1973. "Network Therapy." in The Book of Family Therapy, edited by Ferber, Mendelsohn, and Napier. Boston: Houghton Mifflin. Condenses much of what is covered in Family Networks.

Speck, R.V. and U. Rueveni. 1969. "Network Therapy - A Developing Concept." Family Process 8: 182-191. An Early review of the field from the Philadelphia perspective.

Tolsdorf, C.C. 1976. "Social Networks, Support, and Coping: An Exploratory Study." Family Process 15: 407-417. A fascinating empirical study of the characteristics of social networks of "normal" and schizophrenic males.

and in relationship with even more, they must be trustworthy in order to be trusted, reliable in order to be relied upon, knowledgeable in order to teach and learn, non-threatening in order to consult, pragmatic in order to function, and visionary in order to create new models. Involvement in a purposive change network may be one of the greatest opportunities for learning and personal transcendence that the modern society can offer !"

REMEMBER: RENEW NOW!!

ABSTRACTS

Abstracts of selected papers from the New Directions in Structural Analysis Colloquium, University of Toronto, March 16 - 18, 1978

RYERSON, Stanley B. (History, University of Quebec at Montreal). "Class Analysis in Quebec" (abstract prepared from text by Barry Wellman)

The present crisis of Canada and of Quebec is a crisis of structures of class and nation. The search for a valid practical approach to its resolution entails some readiness to work through successive layers of social theory, some laid down long since, others only now being fine-ground through controversy. The concepts of process and structure (and their interpenetration) evoke, in our present case, memories of Tocqueville, Durham--and Marx... as a way of saying that ours is an ancient, not just a current-immediate problem. The perenniality of British Conquest and its corollary patterns of mercantile-industrial dominance are lived-out in polarity of opposed experience by one or the other of the 'two societies', the one barely conscious of it all, the other, intensely so.

The provincial existence dating back to 1791 has not merely nurtured a sense of Quebec identity, it is now providing an actual armature of operative function in the hands of the first attempt at a souverainiste government since 1837-38. The key question is that of class alignment. The Parti Quebecois may yet be 'recuperated' by the federalist Right. The labor movement, divided and beset by a long-standing underestimation of the nation question, is in danger of falling victim to a doctrinaire denial of the pertinence of national movements and the democratic potential they hold for an 'alliance du travail et de la culture.' Democracy here is at issue, not 'formal' but substantive to working class action for socialism.

GOLD, Gerald (Anthropology, York University). "The Changing Criteria of Social Networks in a Cajun Community" (abstract prepared from text by Barry Wellman)

The objective of this paper is to identify those aspects of Cajun society which sort group members into collectivities, and in particular into networks. The first question that I ask is whether the variables of territorial identification, language choice, the strength of family ties, and age and sex differences, are sufficient to explain the organization of networks within Cajun society and the definition of an ethnic boundary between Cajuns and others. Taken this far, this question is a transactional one, but I will not stop with the assumption that all modes of recruitment can be collapsed into a single set of rules that explain who is Cajun and who is not. There is a symbolic and dialectical sense of being Cajun which is handled differently by individuals and networks. Our contention is that Cajuns who provide services to other Cajuns, the new middle class of the Louisiana Prairies , will be the most assertive in using the symbolic or primordial aspects of their identity as a resource.

OSTON, Robin (Brandeis). "Kinship, Connectedness, and Labour Migration: The Case of Rural Sardinia"

This study, part of a larger monograph on post-war emigration from a small agro-pastoral community of 1500 inhabitants in central Sardinia, discusses (1) the role of kinship in generating an emigrant pool (2) kin relations in the new environment over time; (3) kin ties of the few migrants who are upwardly mobile; and (4) ties of emigrants to kin who remain in the village.

First, all emigrants were identified with patrilineal kin groups. Over 200 were interviewed in depth. Second, non-migrants were interviewed informally about their relationships with emigrated kin. Finally ties among emigrants abroad were analysed: particularly four local areas: Charleroi (Belgium); Milan and its suburbs; Munich and environs; the Turin area.

Although emigration includes members of almost every kin group ,emigrants tend to come from large nuclear families in smaller kin groups which have few ties to others and very distant ties, if any, to the more successful ones. Within kin groups, emigration is concentrated in a small number of nuclear families. Most emigrants were "sponsored" by kin already living abroad, siblings, parents, children, first cousins, uncles, and brothers-in-law. The earliest wave of migration (to Belgium) had the highest rate of kin sponsorship and the largest proportion from very small, landless, kin groups. Later migrations involved more central ones.

Upward mobility seemed to occur where (1) individuals formed exploitative ties to semi-distant kin, while keeping close relatives at a distance; (2) members of nuclear family separated themselves geographically from the community of emigrated paesani and co-perated with each other or an egalitarian basis and (3) an individual minimized ties to all kin in the area and 'went it alone'.

Thus, kin ties appear most active where they serve to organize resources, e.g. in settling emigrants - finding marriage partners ,articulating in their relationship to the property system or opportunity structure. Emigration relieves the pressure on the resources of poorer nuclear families and kin groups by opening up alternative careers and sources of income.

However, it also alienates emigrants from their community and reduces the connectedness of kin who remain at home.

BRYM, Robert J. (Sociology, ... Class, power and Intellectual Radicalism."

Many studies appear to substantiate the view that rates of intellectual radicalism vary inversely with the degree to which intellectuals are integrated in the occupational positions, power structures and values most closely associated with dominant social groups: the lower the level of integration, the higher the rate of radicalism. Academic dissensus has arisen, however, over the question of whether the overall level of integration has displayed a tendency to rise or decline in the course of the twentieth century . Proponents of the former opinion suggest that intellectuals in industrialised societies are becoming embourgeoisified, and are therefore likely to decrease their rate of participation in revolutionary movements; in contrast , proponents of the latter opinion point to the proletarianisation of the intellectual in modern societies, suggesting thereby that the rate of intellectuals' participation in revolutionary movements is bound to increase.

This paper takes issue with both interpretations on empirical and theoretical grounds. Empirically, it seems that revolutionary consciousness among intellecturals in industrialised societies has displayed a tendency toward neither linear increase nor decrease, but has, rather, developed in an irregular cyclical manner in the twentieth century. Theoretically, it is suggested that more accurate predictions concerning the political behaviour of intellectuals may be arrived at only if simple class interpretations are modified so as to incorporate a power dimension. It is demonstrated that, regardless of intellecturals' levels of integration in dominant groups, intellectuals must be sufficiently numerous, organised and endowed with resources if they are to engage in revolutionary politics. That is to say, malintegration alone is a necessary, but not a sufficient condition for the production of intellectual revolutionaries; malintegration and the possession of relatively high levels of power are sufficient.

Secondary sources, both historical and social scientific, are employed in order to substantiate this argument.

TANNER, Adrian (Anthropology,Memorial University). "'Putting Out' and the Social Formation of Non-Capitalist Enclaves"

The study of pre-capitalist social formations is hampered by the fact that there are no longer any 'pure' cases of such formations available for observation. Most have been significantly touched by national and international trade and enterprise. Thus an important question posed by a marxist analysis of pre-capitalist modes of production concerns whether it is possible to isolate the aspect of these modes which is related to the process of articulation with the capitalist or the socialist modes.

One approach to this problem is to look for models from the early history of capitalism. Capitalism first emerged in certain sectors of European society, and the development of capitalism involved the establishment of forms of articulation with other sectors of society with which social and economic interchanges took place, but which retained to some degree their pre-capitalist social formations. Similarly, in many cases the process of colonial and non-colonial enterprise has required that the capitalist mode articulate with non-western group using non-capitalist modes. Marxists have used the concept of domination to describe the character of the institutional context of this articulation and the assumption is often made that because of the ability of the capitalist sector to dominate the articulatory process, the pre-capitalist mode, under these conditions, must be seen having as a temporary, transitional form. Its social formation is seen as on the way to being destroyed, and its populations on the way to becoming absorbed as an underclass within the capitalist social formation to which it has become tied.

However, many of the cases of such an articulatory process, both in early industrial Europe and in colonialist and neo-colonialist situations, reveal a stability which belies the assumption of capitalist absorption. Although, capitalist exploitation takes place, resistance to the full adoption of the capitalist mode by the subordinate group is to be noted. In this paper we will examine one general type of institution which has been associated with many such cases of articulation between capitalism and relatively stable 'enclaves' of non-capitalist production. These are cases of the 'putting out' system. We will suggest that one characteristic of this kind of institution is the ability to bridge the gap between two otherwise incompatible modes of production. Moreover, it is used for this purpose under certain specific material conditions of the production process.

Our second aim will be to enquire into the sources of resistance within the pre-capitalist mode to absorption, and in this case, we will look not at the economic formation, but at the social formation. Our aim will be to reveal the strengths inherent in the social formations of domestic modes of production. Finally, in the light of this analysis, we will return to the question of the prospects for the ethnographic and ethnohistoric reconstruction of pre-capitalist pre-contact social formations.

DOREIAN, Patrick (Sociology, University of Pittsburgh). "Some Models of Structure"

This paper elaborates some structural control models of small group processes. These models take the form of simultaneous difference equations and deal with communication processes in a group. They deal with i) a dyad and ii) larger groups. Data on the communication levels between the governments of India and China before, during and after their period of open warfare

in 1962 are used to estimate the dyadic model. By means of a sliding window technique a series of estimates are obtained for the coefficient matrix which can vary over time. Immediately prior to warfare the eigenvalues of this matrix go outside the unit circle indicating that the process became unstable. At all other times the process is stable. The model fits the data well and has a fruitful interpretation. The model for larger social units fared badly when estimated on data from a Bales' type experiments. Some alternate strategies are suggested for dealing with these data.

WASSERMAN, Stanley S. (Applied Statistics, University of Minnesota, Saint Paul). "Analysing Social Networks as Stochastic Processes". Revised version of Technical Report No. 314.

This paper presents a new methodological for studying a social network of interpersonal relationships. The methods are based on a stochastic modelling framework that allows for the investigation of the changes that occur in a network over time. Specifically, we postulate that these changes can be modelled as a continuous time Markov chain. The transition rates for the chain are dependent upon a small set of parameters that measure the importance of various aspects of social structure on the probability of change.

We discuss the assumptions of the framework and describe two simple models that are applications of it. Several examples are presented and analyzed, and methods of parameter estimation are outlined. The models prove to be quite effective and allow us to better understand the evolution of a network.

KLEIN, Martin A. (History, University of Toronto). "Slavery as an Institution and Slavery as a Mode of Production".

Slavery takes a variety of forms. If these can be seen on a spectrum, the two ends are first, undifferentiated, preclass societies in which the labour of the slave is no different from that of free members of the household, and second, societies characterized by a slave mode production. These are societies in which the major source of sustenance for the ruling class is the expropriation of surplus produced by slave labour. The paper explores the functions that slavery fulfills. It then goes on to examine the conditions that contribute to the evolution of a slave mode of production. The argument is that in certain archaic political systems, the slave mode of production is a way of providing goods and services to the ruling class, but that more recently, the emergence of the slavery M.P. results from incorporation into an expanding market.

SIXEL, F. (Sociology, Queens University, Ontario). "On the Nature of Social Facts and Social Research".

In the first portion of my paper I try to reconstruct briefly how the discussion between Marxism and Phenomenology has overcome the problems of the subject-object relation, i.e. the difficulties of Neo-Positivism.

Characterizing them briefly the conceptual problems of Modern Phenomenology, I try to establish that these can only be resolved by an appropriation of Phenomenology by Marxism.

In a third part of the paper I shall demonstrate the higher potential of Marxism by using Critical Social Research as an example for this fact. This latter part, as it focusses on the dynamics of social research, will be the main part of my presentation.

KILLWORTH, Peter D. (Applied Mathematics, Cambridge, England) and H. Russell BERNARD (Sociology/Anthropology, West Virginia University). "The Reverse Small-World Experiment"

This paper considers the reverse small-world technique. Many "starters" are presented with a very long list (1267) of "targets." Starters are instructed in the small-world experiment and asked to write down their choice for the first link in the chain from them to each of the 1267 targets. The location, occupation, sex, and ethnic background of targets was given, and starters indicated which (if any) of these pieces of information made them think of their choice. Seven conclusions are drawn from the data: 1) A mean of 210 choices control the world, but this number is an underestimate. Only 35 choices control half the world, however. Of the 210 choices, 95 (45%) are mainly used for location reasons; 99 (47%) for occupation reasons; and only 7% of the choices are based on ethnicity or "other" reasons. 2) There appear to be three distinct, and mainly nonoverlapping, networks controlling U.S., local and foreign areas. 3) Choices are mainly friends and acquaintances, with strong cleavage by sex. The most popular type of choice for any target is always a friend or acquaintance; the most popular sex of the choice is that of the target, correct on 70% of occasions. 4) Location is the usual reason for choices, with occupation second most used. The most popular reason for choice for any target is always location or occupation, and may be correctly predicted for any given target 72% of the time. 5) The decision as to which choice is made depends primarily on the occupation of the trigger, and secondly on the distance (near/far) from Morgantown, West Virginia, where the experiment took place. 6) Half the states in the U.S. are controlled by a single person when choices are made on the basis of location. 7) As found in previous experiments, the accuracy of informants in estimating their networks is low.

SEIDMAN, Stephen B. (Mathematics, George Mason University) and Brian L. FOSTER (Anthropology, State University of New York at Binghamton). "The Use of Attribute Data in Network Modeling"

Implicit in many issues of interest to anthropologists is the notion of modeling social networks. It is often asked, for example, what kinds of networks would be produced if certain kinds of norms were followed, or what kinds of changes in social networks would result from certain demographic changes. Although many important issues revolve around such questions, no generally useful procedures for network modeling have been developed. In anthropology, social models are most commonly constructed by intuitive manipulation of kinship diagrams but this method is seldom useful for large populations and in any event is of little utility for networks constituted of non-kinship ties.

It is widely recognized that a general modeling capability would presuppose techniques for working with a variety of social relations. Much social network research has focused on ways of accomplishing this, but much less attention has been given to the incorporation of information about the attributes of individuals.

The importance of accomodating attribute data is readily apparent from even a cursory examination of kinship models, in which at a minimum the attribute of sex is of critical importance. Other network-like models based on kinship (e.g., those concerned with land tenure, labor mobilization, or local politics) normally incorporate other attribute information such as relative age, land ownership, household coresidence, and propinquity. Although such attribute data is critical, it is usually utilized in an informal and ad hoc way because of the lack of a general method for coordinating it with the underlying relational model. The utilization of individual attributes is the subject of this paper, which examines a set of procedures for doing so which we have developed over the past two years. At present, the procedures have been programmed in PL/I and are contained in a larger package of computer programs for modeling and analyzing social structure.

Any method for handling attribute data must be coordinated with a method for recording and analyzing the relational aspects of networks. In our method, a rectangular matrix of numerical attribute data is associated with adjacency matrices of one or more social relations such that corresponding rows represent the same individuals. As presently constituted the procedures perform various types of subsetting operations on either the adjacency matrices, on dummy matrices (as discussed below) and/or on population lists. The different subsetting operations are defined according to three fundamental distinctions. First, either a physical subset may be performed, in which the size of a population is reduced, or a conceptual subset may be performed, in which population members are not deleted, but certain nonzero entries in lists or matrices are replaced by zero entries. The function of the latter is to preserve the correspondence of rows of various matrices which have been subject to different subsetting operations. Second, the criteria which define the subset may be either attributes of single individuals (e.g., sex) or of ordered pairs of individuals (e.g., relative age). Third, a zero-order physical subset retains all rows and columns corresponding to individuals who meet specified criteria, while a first-order physical subset retains the individuals in a zero-order subset plus those contained in any row of the zero-order adjacency matrix.

A simple illustration of the utility of these procedures is the creation of lineages from the adjacency matrix of a parent relation; lineages are simply connected components in the graph resulting from a conceptual subset on sex of parents. In a rather different kind of operation, new relations can be created by using the subset operations on dummy matrices. For example, a matrix of a relation of potential friendship can be constructed using normative constraints to subset a dummy matrix of all ones (e.g., same sex, age difference within a specified range, and same occupation). A different example, of special interest to anthropologists, might be to compare the networks induced by different kinship terminological systems on the same underlying genealogical grid.

One final matter of some practical importance is the disposition of cases with missing data. The theoretical implications of different strategies for handling missing data are beyond the scope of this paper, but most commonly used strategies can be implemented using the subsetting operations described above.

PICKVANCE, Christopher G. (Sociology, University of Kent at Canterbury). "Sociology as Systematic Empiricism?: A Comparison of the Testing of Wirth's Theory of Urbanism and a Study of Voluntary Associations and Multiplex Ties"

The paper draws on an intensive study of social networks in a voluntary association to make two arguments.

Evidence is provided for the theoretical argument that voluntary associations are important in the creation of multiplex ties, and are far from simply collections of unrelated people pursuing ends together. This is because recruitment to voluntary associations can involve personal links (e.g. friends are recruited) which are thereby 'extended' into a new sphere, and because interaction within the association leads to new ties which may later be extended into new spheres. Voluntary associations do not thus simply 'absorb' their members but represent an important source of new relationships within cities.

Secondly, a methodological argument is made against 'systematic empiricism' in sociology by contrasting the above approach with the empiricist way in which Wirth's theory of urbanism has been 'tested', i.e. with no attention to the theoretical processes accounting for the contrary evidence.

GALASKIEWICZ, Joseph and Deborah SHATIN (Sociology, University of Minnesota). "The Social Organization of the Urban Neighborhood: An Application of a Network Perspective" (Revised Version)

This paper is concerned with examining two dimensions of urban interorganizational social structures: the first is patterns of co-operative community solving among organizations, and the second is the stratification of co-operate actors. Comparing interorganizational networks in four Chicago neighborhoods, we will test to see how the level of uncertainty in the task environments of health, education and welfare organizations along with organizational and leadership characteristics shape community problem solving coalitions and affect the relative influence of organizations in these communites.

BERKOWITZ, S.D. and Y. KOTOWITZ and L. WAVERMAN and P. CARRINGTON (University of Toronto). "Measuring Enterprise Structure and Corporate Power in Canada."

Studies of intercorporate control undertaken by sociologists have heavily relied on directorship interlocks as a measure of corporate structure. Economists, by contrast, have assumed that control exists where one firm owns more than some minimum proportion on another's voting stock. This study argues that ownership is the central mechanism through which intercorporate control may be exercised, but that it is impractical to fix some global minimum beyond which control can be said to exist.

Instead, it proposes a combined measure of control which overcomes the disadvantages inherent in both of the earlier approaches. Ownership and director/officership interlock data for the 5305 largest firms of their "parents" operating in Canada are examined in detail. The results of these tests suggest the necessity for some combined measure as a means of detecting highly levered ownership patterns. A general method for formulating such a measure is proposed and tested.

KOENIG, Thomas (Sociology, Northwestern University)."A Network View of Political Contributions by the U.S. Corporate Elite."

Using two clique detection routines, SOCK and COMPLEX, to examine interconnections through interlocking directorates among the Fortune 500 firms in 1972, we found twenty-eight groupings of tightly interlocked corporations. It was discovered that in an intercorporate battle over highway fund use in the state of California, clique membership was a good predictor of political activity. This raises the possibility that firms in a clique cooperate for mutual benefit when dealing with the state.

To further explore this phenomena, political contributions from the directors of the Fortune corporations during the 1972 Presidential election were overlaid on the interlock pattern. The results were inconclusive but some evidence was found that cliques from the same city or region share similar contribution patterns. Important differences seem to exist between the firms which are tightly interlocked and those which are more isolated. Mainstream Democrats (Humphrey, Muskie and Jackson) received their strongest support from directors on more isolated boards while the directors of the cliqued corporations were the strongest backers of Richard Nixon. Surprisingly, the firms in cliques were the least likely to provide money for Richard Nixon through their own officer directors. Rather, they became sources of Nixon support by inviting men who had made large pro-Nixon donations to sit on their boards as outside directors. This pattern was particularly true of banks and insurance companies. These patterns are hard to interpret, but they suggest that there is a corporate establishment composed of the most centrally interlocked firms who members share some norms regarding contributions, but that there are significant variations within that norm.

BURT, Ronald S. (Sociology, University of California, Berkeley). "Autonomy in a Social Topology: An Analysis of the Structural Determinants of Profits for Manufacturing Industries in the 1967 American Economy."

An analysis of profits made by manufacturing industries in the 1967 American economy demonstrates that different levels of profits are a function of the pattern of relations defining a manufacturing industry as a jointly occupied network position. Using interindustry differences in profits as an indicator of interindustry differences in "autonomy" defined metaphorically as an ability to pursue interests without constraint from other actors within a system, three hypotheses are examined: (1) autonomy is a function of collusion among structurally equivalent actors jointly occupying a position as a sector of the economy--an "oligopoly" hypothesis, (2) autonomy is a function of not having extensive transactions with those sectors of the economy that themselves form oligopolies--a "group-affiliation" hypothesis and (3) autonomy is a function of both the "oligopoly" and "group-affiliation" hypotheses conjointly since the two hypotheses merely attend to different aspects of the pattern of relations defining a jointly occupied position in a network--a "structural" hypothesis. Both the "oligopoly" and "group-affiliation" hypotheses provide significant prediction of interindustry differences in profits, however, conjointly they provide significantly better prediction than either can provide alone. The structural hypothesis consequently emerges as the most adequate of the alternatives thereby demonstrating that inherent in the pattern of relations defining a position in a system of actors is a given level of autonomy for occupants of the position.

HARRIS, Peter (*Sociology, Yale University*). *"Measuring Change in the Homogeneity of a Citation Network."*

This is a report of the measurement of an analogous feature of a network where ties take on continuous, rather than binary, values. This feature, called "homogeneity", is the degree to which the ties are similar in strength, and the measure is simply the standard deviation of the (sampled) tie values. The network is that of citations among state supreme courts, and the comparisons here are over time. We find that the citation network has become more homogeneous over time.

HILTZ, Starr Roxanne and Murray TUROFF *(Upsala College and New Jersey Institute of Technology)*. *"Electronic Networks: The Social Dynamics of a New Communications Medium."*

Computerized conferencing systems are specifically designed to facilitate the emergence and interaction of social networks of geographically dispersed persons. This paper reports some of the insights that have been gained to date from a series of research projects utilizing participant observation, field experiments, and laboratory experiments to study the way in which computer mediated communications affect the formation and development of communication and social ties among participants. It includes:
    1. A brief description of the characteristics of this medium of communication.
    2. The social dynamics of computerized conferencing groups, including the process of getting acquainted through the computer, norm formation, sanctioning processes, and electronic migration among groups.
    3. Methodological advantages offered by the computer for the study of the processes it facilitates, including automatic statistical monitoring of communication patterns of members and on-line questionnaires.
    4. Hypothesized impacts upon the nature of social networks in a mass society.

WIREMAN, Peggy *(U.S. Department of Housing and Urban Development)*. *"Intimate Secondary Relations."*

This article identifies and elaborates a new concept, intimate secondary relationships, which combines certain traits of both primary relationships and secondary ones. Its properties are: (1) intense involvement, warmth, intimacy, sense of belonging, and rapport; (2) knowledge of each other's characters; (3) minimal sharing of personal information; (4) minimal socializing; (5) involvement of the individual rather than the family; (6) a commitment which is limited in time and scope and has a relatively low cost of withdrawal; (7) focus on specific rather than diffuse purposes; (8) consideration of public rather than private matters; and (9) a preference for public business meeting places. Such relationships perform important functions in communities which are highly mobile, heterogeneous, or have changing family patterns and relationships. Once formed, intimate secondary relationships persist on an ad hoc basis after participants leave the initial group. The resulting community network of intimate secondary relationships is used for rapid information exchange and problem solving.

ANDREWS, Howard F. 1977. *"The Spatial Context of the Small-World Problem."* Environment and Planning A 9:1253-1258.

Simulating the small-world problem from the conventional viewpoint of a stochastic process operating over a deterministic space is questioned. For a variety of microsocial phenomena, it is suggested that a more appropriate strategy may be to conceive the process in terms of percolation models rather than generalized diffusion models. The distinctions between the two are described and some salient characteristics of percolation processes are briefly reviewed.

ARABIE, Phipps, Scott A. BOORMAN and Paul R. LEVITT. 1978. *"Constructing Blockmodels: How and Why."* Journal of Mathematical Psychology 17 (February):21-63.

Blockmodel approaches to network analysis as developed by Harrison White are shown to fall in a broader class of established data analysis methods based on matrix permutations (e.g., clique detection, seriation, permutation algorithms for sparse matrices). Blockmodels are seen as an important generalization of these earlier methods since they permit the data to characterize their own structure, instead of seeking to manifest some preconceived structure which is imposed by the investigator (e.g., cliques, hierarchies, or structural balance). General algorithms for the inductive construction of blockmodels thus occupy a central position in the development of the area. We discuss theoretical and practical aspects of the blockmodel search procedure which has been most widely used (CONCOR algorithm). It is proposed that the distinctive and advantageous feature of CONCOR is that it solves what is initially presented as a combinatorial problem (permutations of matrices to reveal zeroblocks) by representing the problem as a continuous one (analysis of correlation matrices). When this representation strategy receives further development, it is predicted that the fairly crude empirical approach of CONCOR will be supplanted by more powerful procedures within this same class.

ARMSTRONG, Robin *(Geography, University of Guelph)*. *"Mapping Rural Social Space: A Social Network Approach."* Paper Presented to the Annual Meetings of the Association of American Geographers, New Orleans, April 1978.

Analysis of social interaction patterns represents a theoretically satisfying alternative to factorial ecology as a strategy for mapping social space. Few attempts have been made to

operationalize the concept and these have been limited by the boundary problem inherent in methods which use fixed areal units as the base for the collection and organization of data.

The problem of mapping rural social space is conceptualized as being a two-step problem involving (1) the identification of social network groups and group memberships and (2) the delineation of boundaries for those groups which tend to dominate some territory.

An areally stratified sample of the 562 households in a rural area in southwestern Ontario was taken. Social interaction relationships, measured on a six point scale, between each sampled household and all other households comprised the data. Factor analysis was employed as a means of identifying groups (factors) and identifying group memberships (high, positive factor scores). Alternative sets of group boundaries were determined on the basis of interaction surfaces and other strategies.

DELANEY, John L. 1978. *"Network Dynamics for the Weak Tie Problem."* Harvard-Yale Preprints in Mathematical Sociology, No. 10.

In a Granovetterian world, individuals obtain job information from others met during brief casual encounters, i.e., weak ties. When the role of weak ties is considered in a variety of social settings, it is apparent that they form a necessary communication network for much ongoing social and economic activity.

Recent developments in the structural analysis of information flow and social network theory yield new analytic perspectives and evaluative techniques for studying the behavior of such large scale informal communication networks. The following chapter presents a summary of a computer simulation designed to incorporate some of these new ideas.

Boorman (1975) has developed a comparative statics model that is based on a combinatorial formalism for the transmission of job information in contact networks. Below, his model is modified to run sequentially where individuals search for individually best-possible network positions. Blockmodeling, a technique for inferring social structure by aggregating network data (White, Boorman, and Breiger, 1976), is used to interpret the social structures generated by the simulation.

It is found that widely varying distributions of individual strategies may underlie network equilibria possessing otherwise similar aggregate properties. Also, numerous cases arise in which equilibria fail to appear. Blockmodels of network social structure indicate a tendency towards contact outbreeding in the equilibrium solution.

FRANK, Ove *(Statistics, University of Lund)*. *"Moment Properties of Subgraph Counts in Stochastic Graphs."* Paper presented at the Second International Conference on Combinatorial Mathematics in New York City, April 4 - 7, 1978.

Statistical analysis of stochastic graph models can be based on subgraph counts. General formulae are given which may be used to derive expected values, variances and covariances of such graph statistics. Three different stochastic graph models are used as illustrations. Moments are given for certain dyad and triad counts in a graph with stochastically independent edge occurrences. Moments are also given for some subgraph count estimators which are based on a partially erased graph or a sampled subgraph.

FRANK, Ove *(Statistics, University of Lund)*. 1977. *"Sampling and Estimation in Large Social Networks."* Unpublished Paper.

An unknown network is modelled by a directed or undirected graph having vertices of different kinds. Partial information is available concerning the vertex labels and the edge occurrences within a simple random sample of vertices. Using this information we find unbiased estimators and variance estimators of such graph parameters which can be defined as dyad or triad counts. In particular, we give approximate formulae pertaining to large networks.

HAGE, Per *(University of Utah)*. 1976. *"Structural Balance and Clustering in Bushmen Kinship Relations."* Behavioral Science 21: 36 - 47.

This paper presents some cross-cultural data bearing on the theory of structural balance, or more generally clustering, in social relations at the level of the group. The theory is used to predict the culturally defined ideal combinations of negative avoidance relations and positive joking relations in the G/wi Bushmen kinship system. The analysis also shows the limits of the tendency toward clustering in this system and relates these limits to intergenerational and interband system and suprasystem requirements. Further applications as well as limitations of the clustering model in the analysis of anthropological data are discussed.

HAGE, Per. 1977. *"Centrality in the Kula Ring."* The Journal of the Polynesian Society 86 (March): 27 .

In a communication network one place may be more accessible than another in the sense that its total topological distance to and from all other places is less. Relative accessibility of centrality may be an important structural factor in accounting for the prominence of certain places in a system (e.g. the emergence of leadership in small groups, or the economic and political dominance of a particular community).

Recently Irwin has shown that the most important trading village in the Mailu system of coastal

Papua is the one which not only has ecological inducements to engage in extensive trade but also has the most efficient communication system. What is meant by the latter is the most central location in the network, whereby the relative centrality of each point is measured by the sum of its row in the short path array or distance matrix, N, of the graph, G, of the network. A consideration of the Kula Ring suggests that Irwin's analysis may well have some general application.

The analysis shows (1) the relative centrality of each place in the Kula Ring and compares the characteristics of the most central place in it to the most central place in the Mailu system; (2) considers a general constraint on the presence of trading relations between places; and (3) speculates on some shifts in relative centrality over time.

HAGE, Per. "The Atom of Kinship as a Directed Graph." *Man (N.S.)* 11: 558 - 568.

In contrast to previous analyses of the atom of kinship as a signed graph in which the ideal combinations of relations are predicted from the theory of structural balance, this article suggests a context in which the group is more appropriately conceived as a directed graph whose properties of transitivity and hierarchy are predicted on the basis of the political structure of the society. The analysis is therefore pertinent both to the anthropological analysis of the structure of kinship behavior and the contextualisation of social psychological models of attitudinal consistency.

HALLINAN, Maureen T. and Nancy Brandon TUMA (Stanford University). 1978. "Classroom Effects on Change in Children's Friendships." *Unpublished paper.*

Previous studies of the effects of classroom characteristics on educational outcomes have been concerned primarily with cognitive outcomes, such as academic achievement. In the present paper we examine effects of classroom variables on children's social development. We argue that the way teachers group students for instructional purposes and their pedagogical techniques affect children's proximity and similarity within the classroom, and that these in turn affect their interpersonal relationships. We use longitudinal data from fourth, fifth, and sixth grade children to test several hypotheses predicting influences of instructional organization on the formation and stability of children's friendships. The findings provide evidence that selected classroom variables have a positive impact on the stability of children's existing friendships and on the likelihood that children become more friendly. The results also indicate that weak friendships are more easily influenced by classroom characteristics than close friendships.

HOLLAND, Paul W. (Educational Testing Service, Princeton) and Samuel LEINHARDT (Carnegie-Mellon University, Pittsburgh). 1977. "A Dynamic Model For Social Networks." *Journal of Mathematical Sociology* Volume 5: 5 - 20.

A continuous-time binary-matrix-valued Markov chain is used to model the process by which social structure effects individual behavior. The model is developed in the context of sociometric networks of interpersonal affect. By viewing the network as a time-dependent stochastic process it is possible to construct transition intensity equations for the probability that choices between group members will change. These equations can contain parameters for structural effects. Empirical estimates of the parameters can be interpreted as measures of structural tendencies. Some elementary processes are described and the application of the model to cross-sectional data is explained in terms of the steady state solution to the process.

KLOVDAHL, A.S. (Sociology, School of General Studies, Australian National University). "Images of Networks: A New Window for Observing Society." Paper presented at the Annual Meetings of the Sociological Association of Australia and New Zealand, University of Queensland, Brisbane, May 18 21, 1978.

The study of social networks poses many problems for social research. Even as new methods of collecting and processing network data become available, more challenging problems of analysis and interpretation arise. One reason for the difficulties encountered in network analysis may be deeply ingrained modes of perception: Individuals, social scientists not excepted, can observe only a very small portion of the network(s) in which they are enmeshed and accordingly where network phenomena are concerned it seems much more difficult to develop the analytical intuition essential for fruitful research and sound theory construction.

It is not surprising, therefore, that even the earliest students of network phenomena often made use of visual images (e.g. sociograms) to assist in the analysis, interpretation and illustration of complex relational data. By creating visual representations of network data the human facility for pattern recognition could be used to assist in the search for structural patterns. What is somewhat astonishing, however, is that the techniques for generating visual representations of relational data have remained virtually unchanged since the study of network phenomena began. Thus, the slow, tedious pen-and-ink approach is still very much the order of the day.

Clearly, there is a need for more sophisticated procedures for creating and manipulating visual representations of social networks. In this paper, some possibilities are explored. Firstly, the use of visual imagery in some other disciplines is briefly considered. Secondly, the (limited) development of visual representations of social networks is examined. Thirdly, the use of a computer plotting package for generating three-dimensional and stereoscopic images of

networks (with virtually an unlimited number of nodes) is discussed and examples provided. Fourthly, some suggestions are made regarding the future development of interactive graphics for the study of social networks.

Thus, the paper demonstrates how a presently available plotting package can be used for creating and manipulating multi-dimensional images of networks but at the same time points to the need to develop a package specifically designed to facilitate the use of visual representations in network analysis.

KLOVDAHL, Alden S., S. DHOFIER, G. ODDY, J. O'HARA, S. STOUTJESDIJK and A. WHISH. 1977. "Social Networks in an Urban Area: First Canberra Study." *Australian and New Zealand Journal of Sociology* 13 (June): 169 - 172.

Many intriguing theoretical questions about social interaction in urban areas cannot be answered because of a lack of methodological tools sufficient for studying structural properties of large-scale social networks. An attempt to fill this lacuna, a proposed procedure for studying large networks, is discussed. This procedure, the random walk strategy, involves randomly selecting an urban resident, interviewing this person to obtain information about people with whom he or she interacts, randomly selecting one of those so listed to be the next person interviewed, and so on for the desired number of steps. This initial report focusses mainly on questions of feasibility. The relevant results were very encouraging: It was possible to complete all of the planned random walks (4), each for the desired number of steps (10), within a reasonable period of time (about three months), and with a response rate acceptable for social research (75%). Moreover, nineteen cross-link persons - persons whose social ties were indicated linkages among respondents on different walks - were identified. In short, it was possible to map the network ties that connected a large number of urban residents (c.2,000) in a city approaching 200,000, by using the random walk strategy to collect data from fewer than 50 individuals.

KLOVDAHL, Alden S., D. BURGESS, A. EDWARDS, J. KREITALS, M. STEWART, L. CAYZER, S. WHITE and F. WOOD. 1977. "Social Networks in an Urban Area: Second Canberra Study." *Australian and New Zealand Journal of Sociology* 13 (June): 172 - 175.

A second study of large-scale social networks in an urban area was carried out using the random walk strategy, in part to answer questions that could not be answered on the basis of a single test of this proposed methodological procedure. The design of the second study was quite similar to that of the first, and this report also focusses on elementary but essential questions about feasibility. The results of this study were likewise encouraging: Again it was possible to complete all of the planned random walks, within roughly the same time period, and with a fairly reasonable response rate. In the second study, moreover, 29 cross-link persons were identified, and once more it was possible to map the network linkages connecting a large number of urban residents. Thus, in both the first and the second Canberra studies it was possible to obtain information about a single connected component of a very large urban network by interviewing fewer than 50 randomly selected respondents.

LOMNITZ, Larissa and Marisol PEREZ-LIZAUR (IIMAS, National University of Mexico). n.d. "Urban Kindreds as Networks Of Exchange." Unpublished Paper.

Bilateral kinship systems in modern urban societies have been little studied by anthropologists. One of the difficulties resides in the fact that a cognatic kinship is defined in relation to an ego, but is in practice defined by ego. A longitudinal study of 130 years in the evolution of an urban family in Mexico City shows that the structure of bilateral kinship systems in complex societies may be understood in terms of social networks. The Gomez "Family" is nothing but a set of social fields, defined by socially recognized biological ties plus economic exchange. The combination of exchange among relatives accounts for the persistence of the Gomez "Family" as an identifiable kinship group; at the level of the individual actors this identity is constantly recreated and reaffirmed through acts of exchange among members of kinship network.

We describe and discuss exchanges of information, of goods and of services among socially recognized relatives. The core of the "Family" is represented by three successive generations of entrepreneurs, who relate with their less wealthy relatives as patrons to clients. There is concurrently a great deal of exchange between equals, at every economic level of the network structure. Information is circulated during family rituals and informal social events; in addition, there is a circuit of communication maintained by a few strategically placed "centralizing women" who take it upon themselves to further social cohesion across economic, generational and network boundaries. The real closeness between relatives (as opposed to formal or biological closeness) is determined by the intensity of exchange. The factors which condition intensity of exchange are: physical or geographical distance, social distance, age difference, ideological and economical differences, plus a psycho-cultural variable compounded of trust and affection called confianza.

LOMNITZ, Larissa (IIMAS, National University of Mexico). n.d. "Mechanisms of Articulation Between Shanty Town Settlers and the Urban System." Unpublished Paper.

This paper deals with the articulation between shantytown dwellers pertaining to the "informal" or "marginal" sector of the economy, and the formal institutions of the urban system. Internally, we find a series of social networks based on kinship and neighborhood, which function as

a surrogate social security system for individual survival. Within each network the type of exchange is symmetrical reciprocity of goods, services and information. As soon as one member of the network forms an action set for some specific purpose, recruiting his followers from among the pool of network members, the symmetry of the network is modified. Eventually, ego-centered quasi-groups evolve for economical or political ends; these quasi-groups may be seen as mechanisms for articulating the shantytown with the urban system. Exchange within a quasi-group is asymmetrical and redistributive of the patron/client type. Some patrons are small independent entrepreneurs producing goods and services in a unit of production which uses the available cheap labor of their kinship and neighborhood network; others are brokers who articulate their quasi-group with some formal institution or corporation. Areas of brokerage include labor recruitment, production and commerce, and politics.

TUMA, Nancy Brandon and Maureen T. HALLINAN (Stanford University). 1977. "The Effects of Sex, Race and Achievement on Schoolchildren's Friendships." Unpublished Paper.

The research we have reported was intended to help answer three main questions. First, we wanted to know whether characteristics with status value affect the formation of a friendship between two children, the stability of a friendship that has already been formed, or both. To answer this we looked at changes in children's friendship choices over time. We found that the status characteristics studied (sex, race, academic achievement, and age) tended to affect the stability of best friendships more than the formation of friendships. Being the same sex had very strong effects on all changes in friendship choices, but other status characteristics mainly affected the stability of best friendships. When sex was controlled, best friendships and friendships appeared to be formed nearly at random.

Second, we wished to know whether characteristics with status value in the larger society affect children's friendships because children use them to identify those similar to themselves (similarity effects), because children use them to identify those who are more valuable to have as a friend (status effects), or both. Our findings do not provide a single answer applicable to all four characteristics studied. As mentioned, being the same sex had very strong effects on all changes in choices, but there were no status effects for sex, unless female is considered the higher status. Age had weak status and similarity effects -- mainly on changes from an earlier nonfriend choice. Academic achievement had both similarity and status effects on the stability of best friend choices; these were in the expected direction. Nonfriend choices were also slightly more stable, the greater the difference in the children's achievement. Being the same race had no effect on any changes in friendship choices, nor did race have any effects that suggested that race had a status effect.

The third issue that the research addressed is the extent to which race has effects on friendship when achievement is controlled. Though the point-in-time choices indicate more same-race best friend choices (and fewer same-race nonfriend choices) than would be expected on the basis of chance, multiple regression analysis of changes in choices revealed neither effects of being the same race nor effects of race based on its status value. This does not mean that changes in friendship choices were independent of race. Blacks were noticeably less likely than nonblacks to change to a nonfriend choice of another child.

We have tried to illuminate some of the causal processes underlying the existence of friendly feelings from one child to another at a point in time. We have shown that characteristics associated with friendship in a cross-section need not be associated with friendship formation and friendship stability. We have demonstrated that the effects on friendship of a characteristic with status value in the larger society is sometimes, but not always, related to its status value. Our findings provide no final answers to the questions that we addressed; they do raise issues in need of new lines of theoretical and empirical research.

WHITE, Harrison C. 1976. "Subcontracting With an Oligopoly: Spence Revisited." R.I.A.S. Program Working Paper No. 1, Harvard University.

Michael Spence has recently proposed the study of wages paid by big firms to individuals of different abilities who optimize educations whose cost varies inversely with ability. In this paper his behavioral assumptions are examined and extended. First his perfect and imperfect information cases are reconstrued. Emphasis is placed on the power to frame wage schedules and on the firms' self-interest. The impact of boundary conditions upon wage schedules is shown to precipitate conflict among three classes of employees. These models are then extended to include uniform markups, on costs and wages respectively, and go on to derive optimum markups. Specifically the envelopes for the continuum of equilibrium wage schedules are identified. A special case introduced earlier is discussed as possessing the most persuasive behavior specification. Specification of productivity and cost functions as a Cobb-Douglas family yields explicit solutions, illustrated by cardinal graphs for several sets of numerical values for parameters.

Results are compared using as a yardstick several centralized control institutions optimising various welfare goals. Equity comparisons are of most interest for the wage interpretation, and efficiency comparisons for a subcontracting interpretation.

The models outlined are then transposed to payment by piecework; Cobb-Douglas powers are stepped up or down.

While Spence explores generalizations of his model on the consumer side of the economy, it seems at least as fruitful to consider the production side. Hence a reinterpretation of the previous models is proposed in terms applicable to negotiation of subcontract payments between a set of big firms in an industry and the population of smaller firms regularly supp-

lying them with parts or services of a particular kind. In this context, equilibrium can be reached and changed within months rather than years, and the cost function refers to a current flow rather than an earlier investment. Only wage, not piecework models can be transposed.

In the conclusion Spence's interpretation of his wage model as signalling is shown to make most sense for certain limiting values of parameters. Lines of empirical development are suggested for the subcontracting case. Generalized criteria for signalling affects are suggested.

WHITE, Harrison C. 1978. "Negotiation Within The Firm." R.I.A.S. Program Working Paper No. 11, Harvard University.

The ubiquity of money obscures the fact that negotiation between two parties concerns amounts of at least two different goods. This fact of dual negotiation is more evident and more likely to guide transactions within firms, which are sheltered from the ideology of monetary trans - action which dominates transactions "in the market." Strategic aspects of a transaction appear in a fresh and perhaps clearer light when explicit attention is paid to both goods.

This paper models negotiation between two positions within a firm over quantities of two goods to be exchanged in the next period. The agreed bargain is derived from each party's adjustment schedules without describing particular sequences over time of offers and counteroffers. The usual concept of price is not relevant, but the initial offer of each party lies on a common tradeoff schedule accepted in the firm at that time. The evolution of this schedule over time as successive bargains are struck by various parties, and the degree of realization noted, is not specified in this paper.

The model is applicable between a variety of pairs of positions within a firm and concerning a variety of pairs of goods. For example, it could be a production manager negotiating with a sales manager over the quality level and the lead time on batches of goods for the next quarter. Or it could be a superior and a subordinate negotiating production level versus bonus, which is the example in terms of which the model is developed below.

This analysis addresses several themes from the new organization theory and institutional economics stimulated by Herbert Simon and recently elaborated by O.E. Williamson. "Satisficing" is implicit in the negotiation from schedules. Neither party is a maximizer, and neither is represented by utility functions. The outcome is determined by negotiation as opposed to the fiat of classical authority. As in a market, only the smaller of the quantities offered and demanded for a good can be realized in a trade. Adjustment schedules are not public; each party reserves his strategy.

The specific interpretation of the model in the bonus negotiation example develops in a new way some ideas on budget behavior within firms which also originated with Simon. The subordinate does select an initial aspiration level, subject to a constraint. However adjustments are modeled - not as his dynamic psychological process, but as a structure of mutual corrections to initial goals on bonus and production of each party. The constraint is a convention of the firm which the subordinate may influence, although for definiteness the constraint is assumed in the development below to be set entirely by the superior. Hence the basic formal structure is completely symmetric and no stochastic features have been introduced.

The second part of the paper defines the model, detailed solutions being given in the Appendix. Then the paper interprets the model in some special cases. Parameter ranges are surveyed and the main results presented in a final section. It will be seen that this negotiation process tends to lead to outcomes that one would expect from authoritative planning.

WOLFE, Alvin W. 1977. "The Supranational Organization of Production: An Evolutionary Perspective." Current Anthropology 18: 615 - 635.

Fresh theoretical perspectives are required for understanding the rapid expansion of international economic activity and especially the organization of production on a world scale through institutions of multinational enterprise. An anthropological evolutionary approach which sees these developments as part of the generation of a new system as a supranational level of sociocultural integration seems appropriate to the task. The creation of such a new system is a matter of complex changes in the forms and relationships of many constituent subsystems, not simply a response to technoenvironmental stimuli. Among the cumulating changes are those relative to factors of production, those relative to transactions and those relative to corporateness. Understanding of this developing supranational system requires delineation of newly emerging mechanisms of control. A network model is suggested as appropriate to identifying the ways in which variation in any one part falls under some degree of control by the system represented by its complementary parts.

The following abstracts were submitted by Elinor Ostrom.

CHRISTOPHERSON, Jon A. 1976. "Structural Analysis of Transaction Systems: Vertical Fusion or Network Complexity?"

This paper compares Galtung's theory of imperialism with the more complex global network views of Dominguez. Galtung's theory states that economic, political, military, and cultural transactions are vertically fused into a 'feudal structure' such that the center nations dominate all facets of transactions. Moreover, since vertical fusions on one dimension spill over and structure other dimensions, high degrees of system isomorphisms should be observed. Dominguez on the other hand, suggests that actors will be found in different networks on different dimensions of interaction. Data on trade and diplomatic visits are analyzed. The findings tend

to support Dominguez's views of network structure and challenge the imperialism theory of Galtung. Although the networks are similar, they are not highly isomorphic, and transactions occurred where Galtung's theory predicted they would not.

KNOKE, David and David L. Rogers. 1977. "A Blockmodel Analysis of Interorganizational Networks." Mimeo. (Preliminary draft). Bloomington, Indiana: Department of Sociology.

This working paper reviews some of the recent theoretical and empirical literature on interorganizational relations from a network perspective. Hypotheses are derived from this literature which are then examined using data originally collected by Rogers from 159 public and private agencies in 16 Iowa counties that were active in community development activities. The relationships among all agencies within a county were then analyzed using the blockmodel methods for inferring structure in multiple network data developed by Harrison White and his colleagues. Six different types of relationships among agencies were included in the analysis. The major aim of the paper is then to describe the structure of interactions within the counties included in the study.

MILLER, Nicholas R. 1977. "Graph-Theoretical Approaches to the Theory of Voting." American Journal of Political Science 21 (November): 769 - 803.

Miller uses language, concepts, and theorems from the theory of directed graphs to characterize and analyse the structure of majority preference. Results are derived concerning "sincere," "sophisticated," and "cooperative" voting decisions under two common majority voting procedures: an amendment procedure and a successive procedure. The author uses several criteria to evaluate the results of strategies voters could use under both procedures. Miller concludes on a methodological note: "Possibly the graph-theoretical framework of this article will strike some readers as so much window-dressing -- elegant but unnecessary. Several of the results can be (and have been) obtained more easily and directly by other methods. But I can assure the skeptical reader that other results presented here cannot be so readily obtained -- nor so coherently integrated -- without the aid of the logic provided by graph theory."(p.801)

NUEHRING, Elane M. 1978. "The Character of Interorganizational Task Environments: Community Mental Health Centers and Their Linkages." Administration and Society 9 (February): 425 -

This study describes and characterizes the interorganizational task environments of 30 community mental health centers (CMHCs). Using factor analysis, six types of task environment patterns were identified and correlated with aspects of the organizational context.

"Entrepreneurial" and "collaborative" task environment patterns were characteristic of privately sponsored CMHCs, serving multi-county areas and using a large number of affiliated organizations to deliver basic services. "Altruistic" task environment patterns were characteristic of rural CMHCs, organizationally diffused over a large number of branch operating sites. The remaining three task environment relationship patterns were less clearly linked with contextual aspects of the CMHCs.

The following abstracts were prepared by Jack Ross for the AVAS Newsletter. Reprinted by permission.

BARNES, Sandra T., and Margaret PEIL. 1977. "Voluntary Association Membership in Five West African Cities." Urban Anthropology 6: 83 - 106.

Five studies (N's of 679, 360, 400, 360, 200) were conducted in selected cities of Ghana and Nigeria to answer basic questions about the role of voluntary associations. Do they continue to serve as adaptive mechanisms for new migrants? Who are the members? What factors act as constraints? The conclusions challenge previous findings. Voluntary associations serve the established, not the newcomers. Elites do not belong, and in general membership is highest among those with relatively low incomes. Other social arrangements seem to serve integrative functions, particularly family, secret societies, commercial recreation, neighborhood cliques and informal hometown colleagues, religious contacts other than voluntary associations. Other findings of note: there was considerable variation due to ethnicity, length of residence, sex, type of association. To attempt to account for the empirical variations, a tabular recapitulation of factors influencing association formation is given. The headings are: individual and group dynamics, external constraints, background of residents, and community structure. Each factor is discussed at length, in relation to previous findings.

JEDREJ, M.C. 1976. "Structural Aspects of a West African Secret Society." Journal of Anthropological Research 32 (Fall): 234 - 245.

The author first reviews anthropological writing on West African secret societies, which he finds misleading because of the assumption that explanation was to be sought in their social function. He finds a superior explanation in a structuralist approach, which was implicit in work of several early authors. The error was shared by anthropologists and colonial administrators. Once authorites mistakenly identified Azande societies of magicians as secret societies, the societies were driven underground and became secret. The Sande "secret" society is reexamined using three structural dimensions: people (men/women), space (forest/village), invisible spirits/visible masks. He concludes that "the idea of a secret society is a belief that constitutes part of the ethnographic data to be accounted for rather than one of the terms of such an account".

NELSON, L.D. 1977. "Continuity in Helping Roles. A Comparison of Everyday and Emergency Role Performance." Pacific Sociological Review 20 (April): 263 - 278.

Two lines of thought are found regarding crisis behavior; emergencies cause increased integr-

ation, or increased privatization. Nelson reviews the literature and concludes that the empirical evidence warrants the hypothesis that there will be continuity in the performance of helping roles between ordinary and emergency situations. Data from a mail survey of adult males resident in a city struck by a tornado were used to test the hypothesis. Four indicators of emergency helping behavior (fund donation, donation of goods, relief service given, volunteering relief service) were compared with pre-disaster contributions, volunteer service work, donation of goods, other helping behavior. Control variables were residential proximity, organization membership, and income. The hypothesis of helping role continuity was verified. The more diversified ordinary helping behavior, the more likely emergency helping. The author suggests that further investigation is needed of situational factors and of types of crises.

NORBECK, Edward. 1977. "Changing Associations in a Recently Industrialized Japanese Community." Urban Anthropology 6 (Spring): 45 - 64.

Norbeck studied Takashima in 1950-51 and again in 1974. In this time the community became part of an expanding urban area. Changes involved abandonment of fishing (due to pollution) for industrial employment. Modern consumer goods were then purchased and life was integration into a suburban pattern. Kinship became less important; social relations now are more often based on convergence of interests, and common interest associations are still numerous. Four 1951 associations have disappeared. About 15 associations (or types) are briefly described, and classified as expressive, instrumental or mixed. Reasons for change in principle survivors are examined. For example, Norbeck shows how certain functions of the funeral association are made less meaningful by modern communications and weakened kin ties. Groups called "semiassociations" (service groups or committees) are discussed in similar fashion. The changes in this village are seen as similar to those taking place in Japan as a whole.

TAUB, Richard P. et al. 1977. "Urban Voluntary Associations, Locality Based and Externally Induced." American Journal of Sociology 83 (September): 425 - 442.

The idea that voluntary associations are generated locally as the expression of indigenous interests is widely accepted in the literature of the field. Modern urban conditions make this assumption dubious. Research in a Chicago neighborhood reveals that residents see the city as a whole, or some other place in it as more important for shopping, recreation, banking, social life and outlet for interests. Meanwhile, many outside agencies are legally required or need local organizations in order to articulate with the neighborhood, and may support, sponsor or create such associations. The latter, in turn, may often be composed of nonlocals. A 1974 neighborhood survey is the source of data. The result shows few of the qualities neighborhoods are supposed to have (little local visiting, 11% having local memberships), yet a number of successful associations. Many examples of the articulation of outside organizations and the neighborhood are discussed. Some indigenously generated organizations are based on outside models.

Recent publications related to the research of the Structural Analysis Project, University of Toronto.

BERKOWITZ, S.D., Y. KOTOWITZ and L. WAVERMAN, et al. 1976. Enterprise Structure and Corporate Concentration. Technical Report #17, Ottawa: The Royal Commission on Corporate Concentration. Available from Supply and Services Canada, Printing and Publishing, Hull K1A 0S9, Canada. Catalogue No. Z1-1975/1-41-17. $3.00.

The effects of changing enterprise definitions on corporate concentration. Study utilizes five different definitions of control among firms which are based on combined ownership, director/ officership, and executive board membership ties. Definitions are applied to a large sample of the firms, both domestic and foreign, which most directly shape the Canadian economy. Top four and top eight concentration ratios are compared under the differing definitions.

BERKOWITZ, S.D., P. CARRINGTON, Y. KOTOWITZ and L. WAVERMAN. 1978. "The Determination of Enterprise Structure Through Combined Ownership and Directorship Ties." Toronto: Institute for Policy Analysis. University of Toronto. Available from Publications Office, Institute for Policy Analysis, University of Toronto, 150 St. George St., Toronto, Ontario. M5S 1A1, Canada. On request.

Formal presentation of the model outlined in the study cited above. Arrays of firms under various definitions are compared, and statistics computed on them. Relevance to problems of organizational theory discussed.

BERKOWITZ, S.D., Y. KOTOWITZ, and L. WAVERMAN. 1977. "A Design for a Large Scale Data Analysis System for Corporate Information." Toronto: Institute for Policy Analysis. University of Toronto. Available from Publications Officer, Institute for Policy Analysis, University of Toronto, 150 St. George St., Toronto, Ontario. M5S 1A1. Canada. $5.50.

Description of data archiving and analysis system, programmes, data files (contents and organization), and sub-systems of the Corporate Information Data Base (CIDB) used in carrying out the study referred to above.

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310 B79J79

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262 B79J79

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263 B79J79

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264 B78

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265 B79J79

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ations" in adaptive interorganizational
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266 B78

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267 B79J79

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269 B78

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271 B79

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272 B79J79

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273 B78

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274 B79J79

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275 B78J79

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280 B78

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281 B79

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economic networks), mythology, etc. Papers and
also a ch: "Graph Theory as a Structural Model
in Cultural Anthropology" to appear in Annual
Review of Anthropology Vol. 8, 1978.
282 B79J79

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286 B79

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San Francisco, California 94115
U.S.A.
(415) 563-4321 ext. 2681
Psychology
community, exchange systems, friendship, health
mental health, methods, sex differences, support
Principal interest is in investigating whether
structurally contrasting social networks differ
in their ability to enhance adaptation under
stress. Populations studied to date have includ
recent widows, older women recently returned
to school full-time, and college students during
final exams.
287 B79J79

John E. Hunter
Department of Psychology
Michigan State University
East Lansing, Michigan 48824
U.S.A.
(517) 323-7929
dynamic changes, friendship, information flows
288 B78

Henry W. Irving
Dept. of Geography
The University
Hull, Yorkshire
England
0482-497690
community, methods
Use of questionnaire-collected sociometric data
to establish network indices for individual
respondents in a variety of social environ-
ments. These indices, along with other indices
of social interaction, provide interesting meas-
uring devices in the attempt to measure
community cohesion, anomie, etc. Ref. Social
Forces, June 1977. Social Networks in the
Modern City.
289 B78

N.W. Jabbra
Dept. of Anthropology
Dalhousie University
Halifax, N.S.
Canada
(902) 424-6593
Anthropology
ethnicity, migration
Network-oriented study of Lebanese and Syrians
in Nova Scotia, looking at the processes of
migration, acculturation, assimilation, and
maintenance of ethnic identity and character
istics.
290 B78

Joung-Im Kim
East-West Center
Box 1433
1777 East-West Road
Honolulu, Hawaii 96848
U.S.A.

(808) 946-2439
Sociology
community, friendship, information flows
Research on personal communication networks
and the adoption of family planning in rural
Korea.
291 B78

David Knoke
Department of Sociology
Indiana University
Bloomington, Indiana 47401
U.S.A.
(812) 337-2227
Sociology
community, inter-organizational, political
Inter-organizational network analysis
(blockmodel) of secondary data on
community development organizations in Iowa;
also manpower agencies in New York State
(collaboration with David Rogers at Iowa State;
Howard Aldrich at Cornell).
314 B79J79

John M. Light
Dept. of Sociology - Green Hall
Princeton University
Princeton, N.J. 08540
U.S.A.
Sociology
information flows
Social influence processes, diffusion,
blockmodelling. Most recently a model of social
influence in networks - network is main
independent variable.
293 B78

Robert Llamas
32082 Coast Hwy.
So. Laguna, CA 92677
U.S.A.
(714) 499-3864
Psychology
292 B78

Dr. Norman Long
Department of Anthropology
University of Durham
South End House, South Road
Durham DH1 3TG
England
Durham 64971 (STD 0385)
Anthropology
295 B78

Robert G. Marsh
Board of Sociology
University of California, Santa Cruz
Santa Cruz, CA 95064
U.S.A.
community, elites, methods, political
Power elite work.
294 B78

J.A. Merchant
NUS Corporation
4 Research Place
Rockville, Maryland 20850
U.S.A.
(301) 948-7010
312 B78

Clive Payne
Nuffield College
Oxford OX1 1NF
England
0865 - 45548
Sociology
methods
Developing computer package for the analysis
of social networks (see entry in Connections
Vol. 1, No. 2.)
296 B79

Jane Pfouts
School of Social Work
University of North Carolina
223 E. Franklin St.
Chapel Hill, N.C.
U.S.A.
(919) 933-1225
Sociology, Social Work
kinship, mental health, teaching
Currently interested in exploring the effect of
social networks on the parenting behavior of
a sample of adequate and inadequate AFDC mothers
At this time my main interest is in
experimenting with different methods of
analyzing network properties.
297 B79J79

Narciso Pizarro
Andres Mellado 53, 2-o
Madrid - 15
Spain
1 - 2444282
Sociology
macro-structure
An article "Places et Reseaux" to be read in
Uppsala.
298 B79J79

Roger Pritchard
1514 McGee St.
Berkeley, CA 94703
U.S.A.
(415) 527-5604
Sociology
educational, exchange systems, information flows
inter-organizational, organizational
Preparing analytic bibliography for information
networks in education at national and inter-
national levels focusing on case histories.
Proceeding to Ph.D. dissertation on networks
to be defined after completion of UNESCO
contract consulting on network development.
299 B78

Shulamit Reinharz
Room 421
Dept. of Psychology
529 Union Drive
University of Michigan
Ann Arbor, Michigan 48109
U.S.A.
Psychology
community, information flows
inter-organizational, mental health, methods
phenomenology, support
I'm involved in tracing the network building
and sustaining efforts of alternative human
service organizations. If I understand these
processes adequately we will participate in or
create a network to strengthen these settings.
Probable format is "training/consultation

exchange" among members.
Methods: action research, participant
observation, phenomenology.
300 B78

Seymour Sarason
70 Sachen St.
New Haven, Conn. 06520
U.S.A.
301 B78

Deborah J. Scott
Department of Psychiatry, 3H 23
McMaster University Medical Centre
1200 Main St. West
Hamilton, Ont. L8S 4J9
Canada
(416) 525-9140 ext. 2589/3
Psychiatry
health, support
Two-year prospective study to investigate the
relationship between life stress and health
status change, as modified by social supports
and locus of control. Specifically, we are
looking at size and helpfulness of support
network in general and with respect to stressful
events.
302 B79J79

Michel Silberfeld
Suite 341, Jones Bldg.
The Wellesley Hospital
160 Wellesley St. E.
Toronto, Ontario
Canada
(416) 966-7812
Psychiatry, Epidemiology
community, friendship, health
inter-generational, kinship, mental health
methods, support
survey methods development;
psychological symptoms & social support;
network density methods of analysis
303 B79J79

Parsudi Suparlan
Konsorsium Antar Bidang Dept. P. & K.
Fakultas Sastra, Universitas Indonesia
Rawamangun, Jakarta
Indonesia
Anthropology
authority flows, community, dynamic changes
ethnicity, exchange systems, friendship
information flows, inter-generational, kinship
political, recruitment, religion
technological impacts
I am using network analysis to assess the socio-
cultural effects of television in rural
Indonesia. This research is being conducted by
a team in seven Indonesian provinces for a three
month period of field-work, from January until
March, 1978. I am the team member who made the
research design and who is supervising the field
work in three provinces. The project is
financed by the Indonesian government and the
East-West Center of Hawaii. The final report
is expected to be released in June 1978.
304 B79J79

Dolores Swearingen
Program Evaluation Service
Brentwood Vet. Adm. Hospital
Wilshire and Sawtelle Blvd.

Los Angeles, CA
U.S.A.
(213) 478-3711, ext. 2851 (office)
(213) 360-9242 (home)
Sociology
ethnicity, friendship, health, kinship
mental health, occupational, organizational
A Comparison of Psychiatric and Medical Patients
Social Support Patterns during times of Crises
(Physical, Psychological, Social, and Economic)
as perceived by the patients themselves.
Age, occupational and educational status,
ethnicity, and rural-urban background variables
being taken into account.
305 B79J79

David W. Trimble
14 Ellsworth Park
Cambridge, Massachusetts 02139
U.S.A.
(617) 492-0828
Psychology
community, educational, mental health, methods
organizational, support
Clinical social network intervention
(including full-scale family network assembly)
in communities of the Massachusetts North Shore.
Private practice as a licensed psychologist at
Problems in Living Institute, P.C., Salem.
Public practice as Chief Psychologist,
Lynn Area Department of Mental Health.
Currently designing preventative programs,
employing volunteers trained in social network
intervention, targeted at populations at high
risk for psychiatric casualty.
306 B78

Tom Wickenden
103 Madison St.
Ithaca, N.Y. 14850
U.S.A.
(607) 273-6814
Communication Science
information flows
Working on unified theory of information and
games.
307 B78

Christopher Winship
Institute for Research on Poverty
1180 Observatory Drive
University of Wisconsin
Madison, Wisconsin 53706
U.S.A.
(608) 262-1104
Sociology, Economics
dynamic changes, exchange systems, friendship
methods, occupational
Using networks to develop a theory of roles/
Personal Contacts and Jobs.
308 B79J79

Peggy Wireman
#711 1000 6th St. S.W.
Washington, D.C. 20024
U.S.A.
(202) 554-8208 (home)
(202) 755-6174 (office)
Sociology
community, inter-organizational
organizational
1) developing theory about how people relate in
voluntary boards
2) developing practical implications of network
theory 3) neighborhood theory   309 B78

INSNA MEMBERS BY COUNTRY

Canada
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  313 Andre Desjardins
  277 Maureen Fitzgerald
  286 Peter Harries-Jones
  283 Greg Heil
  290 N.W. Jabbra
  302 Deborah J. Scott
  303 Michel Silberfeld

England
  289 Henry W. Irving
  295 Dr. Norman Long
  296 Clive Payne

Indonesia
  304 Parsudi Suparlan

Ireland
  278 William G. Flanagan

Norway
  276 Arnstein Finset

Spain
  298 Narciso Pizarro

Sweden
  281 Lars Gunnarsson

U.S.A.
  310 Rebecca Adams
  262 Christian Beels
  263 Robert Bezilla
  264 John Bregenzer
  265 Kathleen M. Brown
  266 Thomas F. Burns
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  269 Stephen Chilton
  271 Ronald Curry
  272 W. Robert Curtis
  273 Marc Eichen
  274 Richard V. Farace
  275 Scott L. Feld
  280 Peter Freitag
  279 Noah E. Friedkin
  311 Susan Gore
  282 Per Hage
  284 L.S. Harms
  285 Dean Harper
  287 Barton J. Hirsch
  288 John E. Hunter
  291 Joung-Im Kim
  314 David Knoke
  293 John M. Light
  292 Robert Llamas
  294 Robert G. Marsh
  312 J.A. Merchant
  297 Jane Pfouts
  299 Roger Pritchard
  300 Shulamit Reinharz
  301 Seymour Sarason
  305 Dolores Swearingen
  306 David W. Trimble
  307 Tom Wickenden
  308 Christopher Winship
  309 Peggy Wireman

INSNA MEMBERS BY DISCIPLINE

Anthropology
  264 John Bregenzer
  282 Per Hage

  290 N.W. Jabbra
  295 Dr. Norman Long
  304 Parsudi Suparlan

Communication Science
  274 Richard V. Farace
  307 Tom Wickenden

Economics
  308 Christopher Winship

Education
  279 Noah E. Friedkin

Educational Psychology
  281 Lars Gunnarsson

Epidemiology
  303 Michel Silberfeld

Geography
  273 Marc Eichen

Management Studies
  266 Thomas F. Burns
  272 W. Robert Curtis

Mathematics
  267 Michael Capobianco

Political Science
  269 Stephen Chilton

Psychiatry
  262 Christian Beels
  302 Deborah J. Scott
  303 Michel Silberfeld

Psychology
  271 Ronald Curry
  287 Barton J. Hirsch
  292 Robert Llamas
  300 Shulamit Reinharz
  306 David W. Trimble

Public Health
  272 W. Robert Curtis

Public Opinion Research
  263 Robert Bezilla

Social Anthropology
  286 Peter Harries-Jones

Social Psychology
  272 W. Robert Curtis
  276 Arnstein Finset

Social Work
  297 Jane Pfouts

Sociology
  310 Rebecca Adams
  265 Kathleen M. Brown
  270 Thomas F. Condon
  313 Andre Desjardins
  275 Scott L. Feld
  280 Peter Freitag
  279 Noah E. Friedkin
  311 Susan Gore
  285 Dean Harper
  291 Joung-Im Kim
  314 David Knoke
  293 John M. Light
  296 Clive Payne
  297 Jane Pfouts
  298 Narciso Pizarro
  299 Roger Pritchard

INSNA MEMBERS BY KEYWORD

LATE DIRECTORY ADDITIONS

Bruce D. Becker
Centre for Urban and Community Studies
150 St. George Street
University of Toronto
Toronto, Ontario M5S 1A1
CANADA
(416) 978-8898
Community, Inter-organizational, Methods,
Political, Technological Impacts, Analytic
Tools.
I am working to implement various
graphical methods in computer systems.

Lee Sailer
Dept. of Anthropology
University of California, Irvine
Irvine, California 92717
U.S.A.

DIRECTORY UPDATES (ADDRESS CHANGES & CORRECTIONS)

Stephen D. Berkowitz
Box 307, New College
University of Toronto
Toronto, Ontario M5S 1A1
CANADA

Elinor Ostrom
The Workshop in Political Theory and Policy
Analysis
814 East Third
Indiana University
Bloomington, Indiana 47401
U.S.A.
(812) 337-0441

Mitchell A. Pravatiner
Dept. of Sociology
University of Illinois at Chicago Circle
Box 4348,
Chicago, Illinois 60680
U.S.A.
(312) 996-3015

Stanley S. Wasserman
Dept. of Applied Statistics
School of Statistics
University of Minnesota
352B Classroom Office Bldg.
St. Paul Minnesota 55108
U.S.A.
(612) 376-3920

INSNA FINANCIAL STATEMENT

FINANCIAL STATEMENT FOR MAY 10, 1977 TO JUNE 30, 1978 (PERIOD, VOLUME 1.

Income:	$ (CDN.)
Membership dues	2856.64
Bank Interest	23.66
Subscriptions to SOCIAL NETWORKS	780.00
Total Income	$3669.60

Expenditures:	
Printing	2436.63
Handling and Mailing	340.00
Salaries and Fees	115.00
Supplies	90.38
Promotion	91.28
Overhead	35.28
Subscription revenue to SOCIAL NETWORKS forwarded to Elsevier-Sequoia	750.30
Total Expenditures	$3855.10

Net Deficit: $ 185.50

Note: Above includes accrued printing and
mailing costs for Volume 1, Number 3.

"I have examined the records of the International Network for Social Network Analysis and believe the attached financial statement represents a true report of operations for the period May 10, 1977 to June 30, 1978."

H.G. Stuart, Accountant,
30 Carabob Court,
Agincourt, Ontario,
Canada.

.... #.......
(6/78)

INSNA Membership & Subscription

TO: INSNA, c/o Centre for Urban and Community Studies, 150 St. George Street, University of Toronto, Toronto, Ontario, Canada M5S 1A1.

MEMBERSHIP

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/_/RENEW

This is a membership RENEWAL. Please UPDATE my Directory information as indicated below and send me the indicated publications.
/_/UPDATE

This is a NEW membership. Please enter my Directory information and send me the indicated publications.
/_/NEW

PUBLICATIONS

CONNECTIONS (Bulletin of INSNA; 3 issues)
    Vol. 1 (1977-1978; limited quantities remaining). $7 (US or CDN $)   /_/B78
    Vol. 2 (1978-1979). $8 (US or CDN $)   /_/B79

SOCIAL NETWORKS (Quarterly journal; INSNA discount to Members). $20 (US $ only)   /_/J79

Make all checks payable to INSNA.

Institutional subscribers to SOCIAL NETWORKS should contact Elsevier-Sequoia, PO Box 851, CH-1001 Lausanne 1, Switzerland.

NETWORK DIRECTORY

For New Members and Updates (Please Print or Type):

Name:...
    (last name)   (first name)

Address:...

....

....

....
    (country)

Telephone:.................................
    (area code)

DISCIPLINARY AFFILIATION (Please circle one):
anthropology   communication science   computer science   economics   education   geography
history   information science   management studies   mathematics   planning   political science
psychiatry   psychology   social work   sociology   statistics   other ....

KEYWORD DESCRIPTORS OF WORK (Please circle relevant items):
authority flows   community   children   dynamic changes   educational   elites   ethnicity
exchange systems   friendship   gerontology   health   information flows   inter-generational
inter-organizational   kinship   macro-structure   mental health   methods   migration
occupational   organizational   phenomenology   political   recruitment   religion   sex differences   support   teaching   technological impacts   other ....

CURRENT NETWORK ACTIVITY: ....

....

....

....