

CALENDAR

	2001	2002
JANUARY		Computer Support for Collaborative Learning: Foundations for a CSD Community 1/7-11: Boulder, Colorado
FEBRUARY	International Conference on Subjects, Actors and Social Movements in the North & South 2/26-27: Rome, Italy	International Social Networks Conference 2/13-17: New Orleans
MARCH	Annual Meeting of the Public Choice Society, Economic Science Association, Society for Social Choice and Welfare 3/9-11: San Antonio, Texas	Transforming Spaces: the Topological Turn in Technology Studies 3/22-24: Darmstadt, Germany
		Southwestern Historical Association & Southwestern Social Science Association 3/27-30 New Orleans
APRIL	International Social Networks Conference 4/25-29 April: Budapest	Princeton-Northwestern Junior Scholars' Workshop on Embedded Enterprise in Comparative Perspective 4/11 -14: Princeton University
	International conference Comparing Cultures. Dimensions of Culture in a Comparative Perspective Tilburg University 4/ 27: Netherlands	Western Social Science Association Rural and Agricultural Studies 4/10-13: Albuquerque, New Mexico
MAY	Canadian Sociology & Anthropology Association 5/27-30: Laval, Québec	International Communication Association: "Communication Research Matters" 5/24-28: Washington, DC
	International Communication Association 5/ 24-28: Washington, DC	International Congress: Causation and Explanation in the Natural and Social Sciences 5/ 15-18: Ghent Univ. Belgium
	Third Annual Graduate Student Conference: "Bridging Divides" University of Toronto 5/16-18: Toronto, Canada	Thematic Conference for Network Analysts University of Lille I 5/30-31: Lille, France
JUNE	6th Workshop on Economics with Heterogeneous Interacting Agents June 7-9: Maastricht	ISMIS 2002 13th International Symposium on Methodologies for Intelligent Systems 6/27-29: Lyon, France

CALENDAR

JULY	Global Studies Association: Networks and Transformations 7/ 2-4: Manchester, UK	SA Research Committee on Sociology of Sport RC27 XV ISA World Congress of Sociology 7/7-13: Brisbane, Australia
	XXV International Congress of Administrative Sciences 7/9-13: Athens, Greece	International Conference on Cultural Attitudes Towards Technology and Communication 12-15 July: Montreal
	Eight International Facet Theory Conference: Integrating Theory Construction with Data Analysis 7/15-18: Prague	
AUGUST	American Sociological Association 8/18-22 Anaheim	American Sociological Association 8/16-20: Chicago
	IJCAI Workshop: Inconsistency in data and knowledge 8/6: Seattle	
SEPTEMBER	European Sociological Association: Visions and Divisions. Challenges to European Sociology 8/28 - 9/1: Helsinki, Finland	
	International Conference: Methodology and Statistics 9/17 - 19: Ljubljana, Slovenia	
	SAFECOMP 2001: The 20th International Conference on Computer Safety, Reliability and Security 9/26 - 28: Budapest, Hungary	
OCTOBER	Association of Internet Researchers 10/10-14: Minneapolis-St. Paul	
NOVEMBER		International conference on questionnaire development, evaluation, and Testing 11/14-17: Charleston, S. Carolina
	American Anthropological Ass'n 11/28 - 12/2: Washington, DC	American Anthropological Ass'n 11/20-24: New Orleans
DECEMBER		

**International Sunbelt Social Network Conference
XXII**

Sponsored by the International Network for Social Network Analysis

HOT JAZZ, COOL NETWORKS!

<http://csu1.spcomm.uiuc.edu/Conf/SunbeltXXII/index2.htm>

The International Sunbelt Social Network Conference, sponsored for the past twenty-two years by the International Network for Social Network Analysis, is a major forum for discussion of theory, methods, or applications of social networks. It provides the opportunity for new and experienced social and behavioral scientists, mathematicians, statisticians, computer scientists, and others interested in social networks to meet and share ideas, research and practices. The Sunbelt Conference returns in 2002 to the unique city of New Orleans, providing an ideal setting to enjoy a little hot jazz and a lot of cool networks.

Sunbelt XXII runs from Wednesday, February 13th to Sunday, February 17th. Workshops take place on February 13th, with general sessions beginning at 8 am on Thursday, the 14th, and finishing on the afternoon of Sunday, the 17th. An INSNA business meeting will be held during the conference; all INSNA members are invited to attend the meeting.

The keynote address will be given by Philippa Pattison, School of Behavioral Science, University of Melbourne, Australia, the recipient of the 2002 Simmel Award, given by INSNA. The keynote address will be made on the afternoon of Thursday, February 14th, and will be followed by a Conference Reception.

Two plenary lectures will be given at Sunbelt XXII. Duncan Watts, Department of Sociology, Columbia University, New York, will speak during the Conference Banquet, on the evening of Friday, the 15th. Bernice Pescosolido, Department of Sociology, Indiana University, will address the conference on the afternoon of Saturday, the 16th.

CONFERENCE HOTEL

The hotel for the conference, at which all sessions will be held, is the four diamond, award winning

Le Meridien Hotel

614 Canal Street, New Orleans, Louisiana, U.S.A.

Reservations: 1-800-543-4300 (toll free), or 1-504-525-6500. Fax: 1-504-525-1128
Conference room rates are from \$143 US (superior, single or double) to \$195 US (deluxe, triple). Please note that these rates are in line with hotel rates in major US cities, and that the Le Meridien is a luxury hotel.

Be sure to mention the Sunbelt Conference to obtain conference rates
Conference rates for the hotel are in effect from Feb. 12 to 17th

Note that there are far fewer rooms reserved for Sunbelt on the 12th,
which is still Mardi Gras, than on subsequent days

Do not hesitate – make your hotel reservations now, especially if you are going to be in New Orleans on February 12th in order to attend the workshops on the 13th (or if you want to experience Mardi Gras!). Rooms will be held at conference rates only until January 12th. Early registration will also allow the hotel to give the conference more rooms if needed. As usual, a hospitality suite will be available and open throughout the conference at the hotel.

SUNBELT 2002

CONFERENCE BANQUET

The banquet will be held at 6PM on Friday, February 15th. It will be a New Orleans buffet, featuring great and varied food, including multiple New Orleans specialty entrees and desserts. It will cost \$40 per head including tax and tips. The banquet will be well worth it! – Le Meridien has a renowned French chef, and as we have noted, is a luxury hotel. There are lots of other food options in New Orleans – it is important to note that all these other options can be much more expensive!

ORGANIZED SESSIONS

- C We are pleased to announce six organized sessions for Sunbelt XXII. They are:
- C Deviant and Criminal Networks -- Organized by Peter Carrington
- C Networks and Culture -- Organized by Ronald Breiger
- C The Small World of the Corporate Elite in Comparative Perspective -- Organized by Roy Barnes
- C Historical Network Analysis I and II -- Organized by Joerg Raab
- C Analysis and Visualization of Network Data -- Organized by Ulrik Brandes
- C Consulting with Social Network Analysis -- Organized by Valdes Krebs
- C Scholarly Networks -- Organized by Iain Lang

Details on the sessions can be found at the conference web site.

WORKSHOPS on February 13, 2002

- C Wouter de Nooy, Andrej Mrvar, and Vladimir Batagelj: Exploratory Social Network Analysis with Pajek
- C Stephen Borgatti and Martin Everett: Introduction to the Analysis of Network Data via UCINET
- C James Moody: Using the Social Network Data from the National Longitudinal Survey of Adolescent Health
- C Tom Snijders: The Analysis of Longitudinal Social Network Data
- C Barry Wellman: Networks for Newbies

Details on these workshops, including fees, can be found on the conference web site.

Conference participants can register for these workshops at the Registration page on the web site.

REGISTRATION AND CONFERENCE EXPENSES

Please go to Registration web page on the conference web site to register. All fees should be paid there via credit card. The web site is: <http://csu1.spcomm.uiuc.edu/Conf/SunbeltXXII/index2.htm>

Conference fees for Sunbelt XXII (excluding workshops) are:

Before February 1st, 2002 (After February 1st or at New Orleans: add \$20)

- < INSNA members: \$90
- < Non-INSNA: \$135 (includes INSNA membership for 2002)
- < Student: \$45
- < Conference Banquet: \$40

CALL FOR PAPERS

We invite you to submit abstracts for contributed papers for Sunbelt XXII. Abstracts should be submitted electronically via the Sunbelt XXII website, and need to be received no later than November 15th, 2001.

Announcements

MEETINGS

CALL FOR PARTICIPATION

CSCL 2002

Computer Support for Collaborative Learning: Foundations for a CSD Community

<http://www.cscl2002.org>

January 7-11, 2002

Omni Resort Hotel

Boulder, Colorado, USA

Conference Overview

CSCL (Computer Support for Collaborative Learning) 2002 is an international conference to be held near Boulder, Colorado, USA, on January 7-11, 2002. CSCL 2002 will explore opportunities for computer and Internet technology to support collaborative forms of learning and teaching. The theme this year focuses on strengthening the foundations for the field of CSCL: theory, technology, evaluation and community building.

The CSCL conference is a major event that brings together people involved in all aspects of the field of CSCL, including research, education, training and technology. The conference will be highly interactive, with opportunities for people with different interests, backgrounds and specialties to learn, share and collaborate. There will be featured presentations, research papers with discussion, poster sessions, tutorials introducing special topics, workshops exploring specialties, demos of commercial and experimental technologies, a doctoral consortium and other interactive events.

For detailed up-to-date information please visit the conference website: <http://www.cscl2002.org/>

For specific questions about the conference that are not answered at the conference website, please contact: Shana Lourie at: shana@cs.colorado.edu

Important Deadlines

- June 1, 2001 Submissions due
- Aug. 15, 2001 Authors of submissions notified
- Sept. 15, 2001 Revised versions of submissions
- Oct. 15, 2001 Student Volunteer applications
- Nov. 1, 2001 Deadline for early registration
- Jan. 7-11, 2002 CSCL 2002 conference

Submissions & Presentation Formats

Submissions on all topics within the field of CSCL are welcome. Special consideration will be given to submissions that address foundational issues of the field. All submissions will be rigorously peer reviewed. They must be submitted electronically, properly formatted and fit on 10 pages or less. Submissions that are accepted by the Program Committee will be published in the official conference proceedings and may be presented at the conference.

A variety of presentation formats will be available for accepted submissions. Traditional formal presentations (e.g., a talk with slides) will be grouped with related submissions and a discussant will lead interaction with the audience. There will also be poster sessions, where presenters can display their work and discuss it informally with viewers. Roundtables will allow a group of people who have read a paper to discuss it intensively with the author. In addition, submitters may propose tutorials, panels, workshops, demos, interactive events, asynchronous interactions or other innovative formats. Students may apply for the doctoral consortium, where they can discuss their Ph.D. dissertation topics with other students and faculty.

Special consideration will be given to high quality submissions that contribute to the foundations of CSCL including publication in a planned edited book, a journal special edition and featured presentations at the conference. Foundational submissions can, for instance, provide overviews of the field, critical comparisons of relevant theories, methodological proposals or visions of collaborative learning. The best of these may be presented as plenary talks. Submissions with a student first author are eligible for a best student paper cash prize.

Special procedures apply to submissions intended for tutorials, workshops, demos, interactive events and the doctoral consortium. Detailed instructions provided at the conference web site: <http://www.cscl2002.org/>

Workshops

Please see our website and discuss submission ideas with one of the Co-Chairs:

Tamara Sumner, Sumner@colorado.edu, or
Paul Mulholland, P.Mulholland@open.ac.uk

Workshops provide a valuable opportunity for

researchers and practitioners to discuss and share ideas around innovative, timely, or controversial topics of relevance to the CSCL community. Proposals should discuss the purpose and organization of the workshop, emphasizing how the workshop will facilitate discussion and engagement amongst the participants. Initial workshop proposals should not exceed 3 pages.

Tutorials

Please see our website and discuss submission ideas with the Chair:

Anders Morch, a.i.morch@intermedia.uio.no

Tutorials offer a limited number of participants the opportunity to learn about specific concepts, methods and techniques from any of the focal areas of theory, technology, evaluation and community building.

We particularly invite tutorials that experiment with new forms of interaction between learners and teachers, such as employing innovative technologies, actively engaging the learners in design or evaluation, exploring distributed settings within the format of a conference, and pedagogical principles and theories that will help to strengthen CSCL community building.

Interactive Events

Please see our website and discuss submission ideas with the Chair:

Daniel Suthers, Suthers@hawaii.edu

Interactive events are intended to engage conference participants in exploring current issues of CSCL design, experiencing new technologies, and sharing methods for research and practice. Proposals are invited on any of the focal areas of theory, technology, evaluation and community building. Possible formats are limited only by proposers' imaginations, but should include a significant measure of participation by attendees.

Doctoral Consortium

Please see our website and discuss submission ideas with the Co-Chairs:

Michael Eisenberg, duck@spot.colorado.edu, or
Amy Bruckman, ASB@cc.gatech.edu

The Doctoral Consortium provides an opportunity for Ph.D. students who have successfully completed their dissertation proposal in fields related to CSCL to share their work-in-progress with peers and faculty selected from across the field.

Location

The conference will be held at the new Omni Conference Center outside of Boulder, at the foot of the Rocky Mountains. There will be opportunities for informal discussions with colleagues from around the world, as well as hiking on nearby trails, shopping in the new Flatirons Crossing Mall, and dining and entertainment in Boulder and Denver. For skiers, snowboarders, and snowshoers, CSCL 2002 promises to be a great winter location! Arrangements can be made for ski passes and transportation to local resorts before and after the conference. For those who can't do without the Internet, you can stay connected through the Ethernet drops in each Omni guest room.

More about CSCL

CSCL has been developing for several years and has entered a vibrant period of activity internationally. The acceptance of the Web and the recognition of the importance of distance education in various countries have made advances in CSCL particularly urgent. Broad concerns about the limitations of traditional educational approaches in an increasingly global and technological world underscore the need to realize the potentials of collaborative learning and computer support.

CSCL holds a number of promises:

- To develop a theoretical understanding of learning as a collaborative process that is socially and culturally situated.
- To develop technologies that mediate collaboration, that augment cognitive skill development, and that make knowledge and knowledge-building communities more broadly accessible.
- To develop ways of observing and assessing collaborative learning and knowledge building.
- To develop a community of researchers and practitioners working together to realize the promises of CSCL.

Important steps have been taken in each of these areas in the past several years, as reported at previous CSCL conferences. A variety of CSCL systems have been developed and numerous studies have been conducted of their use in classrooms. However, further progress is needed to provide a solid foundation for CSCL as a robust, effective research field. We need to start to coalesce and strengthen a set of coherent foundations – without imposing a narrow approach or stifling the healthy interchange of conflicting interdisciplinary

perspectives. The CSCL 2002 conference in Boulder will be a catalyst for this. As we propose, explore and evaluate new tools, studies and techniques, we will consider how these specifics contribute to the foundations of an educationally important research field.

Sponsors

CSCL 2002 is supported by the University of Colorado at Boulder:

- The Center for LifeLong Learning and Design (L3D)
 - The Department of Computer Science
 - The Institute of Cognitive Science
 - The Coleman Institute, and by
 - Microsoft Research
-

Transforming Spaces: the Topological Turn in Technology Studies

Darmstadt, Germany
March 22-24, 2002

Organized by the post-graduate school "Technology and Society" at the University of Technology Darmstadt with financial support from the German Research Council.¹

This conference will problematize the spatial character of the relationship between technology and human beings. It addresses two interrelated questions:

To what extent do machines and media organize society three-dimensionally-thus ordering the spaces in which modern life takes place? And, conversely, to what extent do material and communicative structures open up new mental and physical spaces-thus transforming the boundaries of daily life?

To denote our explicit concern with spatiality we propose the mathematical term "topology."

The days are gone, when "technology" meant only the material means used by rational human seeking goals in accordance with principles of maximum efficiency and economic return. Today, scholars in the interdisciplinary field of "technology studies" emphasize the symbolic and discursive character of our artifact-saturated universe, as well as the machine's subtle perpetuation of social inequalities and political conditions. These scholars have begun to discuss technology as a medium, as a human- created "ambience" that infiltrates interpersonal relations and permeates society. Focusing

on the spatial dimension of materials and media, this conference intends to shape developments in the field. Technology has become a kind of second nature in modern life. For instance, cell telephones, computers, and the internet enable us to become more independent of physical location. The death of distance has been declared. Simultaneously, however, they have influenced mobility and cognitive patterns, as well as re-drawn the boundaries between the private and public spheres. By bringing out the spatial character of modern technology, the conference takes seriously its "topological" nature-both on a physical and discursive level. And, by focusing on urban structures, simulation techniques, and visualizing media in daily life, it intends to investigate the spatial character of technology in various settings and from various theoretical points of view.

Technologies, we argue, are far more than passive physical presences. They mediate between human beings, they bridge physical distance, and they contribute to the transformation of individual identities. They allow people to interact at new places, they open up new mental spaces, and they help us to visualize new arenas for action. The spatial character of the human-made world is not limited to computers and other information technologies.

Machines and media also impose on the world a certain multi-dimensional "order of things." In urban settings especially, buildings, streets, and lighting systems make up a set of material "dispositives" that strongly define what "degrees of freedom" citizens may enjoy.

The conference will be divided into four sections, each consisting of one 45-minute plenary speech and two parallel paper sessions, each of which will include four presentations. There will be 20 minutes scheduled for the oral presentation of each paper, followed by 15 minutes discussion. To guarantee insightful introductions to the various topics, four internationally outstanding plenary speakers have already accepted the invitation; cf. program below.

One-page abstracts for papers, accompanied by a one-page CV, may be sent to Professor Mikael Hård, Department of History, Technical University Darmstadt, Schloss, DE-64283 Darmstadt, Germany: hard@ifs.tu-darmstadt.de, before Nov. 1, 2001.

¹<http://www.ifs.tu-darmstadt.de/gradkoll/index.html>

Program

Section 1: Coping with Urban Places: Physical Structures and Daily Life in the Modern City

Plenary Speaker 1:

Thomas J. Misa,

Illinois Institute of Technology:

Creating the Vertical City: Skyscrapers as Sociotechnical Milieus

Section 2: Coping with the Dimensions: Visual Technologies and the Re-ordering of Spaces

Plenary Speaker 2:

David Gugerli,

Eidgenössische Technische Hochschule Zurich:

Visualizing the Human Body

Section 3: Virtual Entertainment, the Arts, and Emerging Lifestyles

Plenary Speaker 3:

Lev Manovich,

University of California at San Diego:

Image-space:

a Case Study in Post-media Aesthetics

Section 4: The Spatial Dimension of Human- non-human Interaction

Plenary Speaker 4:

Kevin Hetherington,

Lancaster University:

Relationality, Topology and the Disposal of Space

all workshop members. One among several regionally organized sessions will be devoted to a discussion of embedded enterprise in Japan. Junior scholars working on Japan are therefore especially encouraged to submit proposals, but we welcome research on all other regions as well.

The conference will take place on the campus of Princeton University beginning on Thursday afternoon, April 11 through Sunday, April 14, 2002. All participants will present their work in small group sessions which will be organized thematically. Accommodations will be provided and transportation costs partially reimbursed.

Participants should be doctoral candidates and have completed some portion of fieldwork by the time of the workshop, or they should have defended their dissertation after January 1, 1999. Projects limited to research on the United States and projects which do not involve fieldwork cannot be considered. Participants will be expected to submit, by March 1, a written basis for substantive discussion. This may consist of anything from initial conceptualizations of field observations to, polished dissertation chapters, to papers that are ready for publication. Since participants are required to thoroughly review a subset of other written submissions prior to the workshop, these submissions should be limited to 35 double-spaced pages. Proposals up to 1,000 words are due by December 1, 2001.

Submission guidelines and more information about the workshop can be found at:
<http://www.princeton.edu/~embedded/>

CALL FOR PROPOSALS

Princeton-Northwestern Junior Scholars' Workshop on Embedded Enterprise in Comparative Perspective

April 11 -14, 2002

Princeton University

<http://www.princeton.edu/~embedded/>

We are inviting proposals for participation in an interdisciplinary young scholars' workshop on embedded enterprise in comparative perspective. The workshop will provide an opportunity for intensive exchange among graduate students and recent Ph.D.s, and a select group of faculty mentors from a variety of disciplinary backgrounds in the social sciences and regional studies.

Participants will rotate through 5-7 (theoretically, methodologically, and regionally organized) subgroups to ensure a maximum of contact among

ANNOUNCEMENT AND CALL FOR PAPERS

With INSNA support: Second European Thematic Conference for Network Analysts

Thematic Conference for Network Analysts

University of Lille I, France

May 30-31, 2002

Micro-macro Relations : Advances in the Contribution of Structural Analysis

<http://www.univ-lille1.fr/lilnet/>

Organization: Alexis Ferrand, Emmanuel Lazega

The success of the 2000 thematic conference of network analysts in Maastricht (2000), on network sampling, organized by Marinus Spreen, Ove Frank,

and Tom Snijders, is an incentive to organize a new such conference, this time on a different topic: advances in structural thinking and modeling of micro-macro relations in the social sciences.

At this early stage, we are looking for any expression of interest, support, and contribution to the organization of the conference (titles of papers, suggestions of sessions, training seminars, etc). Theoretical and/or methodological, empirical and/or simulation-based presentations focusing on the topic of micro-macro relations in all kinds of substantive fields will be most welcome.

We think that it is appropriate to organize such a meeting on this general topic, based on the following thinking.

Traditionally, the ways in which the social sciences have framed the micro-macro link have reflected various basic theoretical assumptions. Market mechanisms, or religious beliefs concerning 'the sacred,' or formal politics have been considered central to multilevel social orders. Formal parliamentary politics, for example, presuppose that actors choose legitimate representatives who sit on assemblies and committees making rules and public policies for society as a whole, then promoting and enforcing locally their global conception of the common good. Structural approaches to this issue have tended to insist on more informal politics. The latter presuppose that members of a social setting also politicize their exchanges, solidarities, controls, and regulatory activities. This informal politicization can be assumed to use identities, cultural dispositions, legitimacies and norms provided from above by society at large to guide members actions at the local level. Or it can be assumed to rest on members' uses of power that is derived from resource interdependencies or pre-existing opportunity structures. Such power differences maintain or establish constraints on everyone (but on some more than on others, though) at the micro level. Because members react to the constraints imposed on them by norms, opportunity structures, or resource dependencies, or all of the above, changes can be introduced from 'below' in the structures that were previously exercising these constraints from 'above'. Dynamic thinking is thus brought into the picture, almost by definition, in this approach to the micro-macro issue.

Many of these various actor- or structure-oriented approaches have already benefited from methods and measurements provided by network analysis. For example, power can be measured by various kinds of centrality; constraints and auto-

nomy by variable measures of density; social niches and division of work by measures of both approximated structural equivalence and cohesion; etc. However, thinking about the micro-macro relationship based, for example, on knowledge of the dynamics of structures has is lacking. Does a broadly-conceived structural approach to social life have something to say about such a dynamic link?

Today, there seem to be trends in network analysis that could converge in this direction. Traditionally, most network analysts have looked at the micro-macro link above all as a technical issue. For example, at one end, current network analysts have been trained (largely by blockmodeling) to think about social structure in terms of identifying differentiated social positions and the interdependencies between them. In this approach, it is the way in which individual nodes in the network are distinguished by patterns of incoming and outgoing ties that is examined. In this approach, the interest can focus on how individual behavior and outcomes of various sorts differ across network members and their categories (or multilevel contexts). However, at the other end, current or p^* models have a different focus, asking what local processes might be responsible for the overall structure. They assume local sub-structural constraints (or dependencies) and argue that once the analysis has taken account of these local structural tendencies, the overall structure is put together "independently" from these pieces — i.e. there is no global structure beyond the local structural tendencies. Global structure or structural tendencies (such as a bipartition of the network into friendship cliques, for example) can be explained in terms of local constraints (tendency for friends of friends to be friends, for example).

Can the two approaches be made usefully complementary by introducing structural reasoning on the micro-macro relationship such as that outlined above? Reaching the macro level and a classification of members of a social setting based on the description of relational substructures at the dyadic or higher order level, where the focus is on ties, cannot be done purely mechanically. Can theoretical (but hopefully realistic) assumptions cited above about actors, their forms of rationality, their capacity to politicize their exchanges, controls and regulatory activities, be useful to the establishment of this complementarity? Is this where network analysts are brought back to the traditional and dynamic connections between the micro and the macro levels of analysis in the social sciences?

The goal of this conference is to provide and confront contributions to this debate by social scientists using network analysis.

The Université des Sciences et Technologies de Lille I and the Clersé-Cnrs will host the conference. Lille is the capital of the Flandres, in the middle of a triangle made up of Paris, Brussels and London, and thus easily accessible by train from any of these metropolises.

To contact us, express interest, propose ideas, topics, or sessions for the conference :

Lilnet Conference
Institute of Sociology
University of Lille I
Cité scientifique
59655 Villeneuve d'Ascq Cedex

or

Alexis.Ferrand@univ-lille1.fr
Emmanuel.Lazega@univ-lille1.fr

CALL FOR PAPERS

International Conference on **Cultural Attitudes Towards Technology and Communication**

(CATaC'02)

12-15 July 2002
Montreal, Quebec, Canada

<http://www.it.murdoch.edu.au/~sudweeks/catac02/>

Conference theme:

The Net(s) of Power:
Language, Culture and Technology

The powers of the Nets can be construed in many ways – political, economic, and social. Power can also be construed in terms of Foucault's "positive power" and Bourdieu's notion of "cultural capital" – decentered forms of power that encourage "voluntary" submission, such as English as a *lingua franca* on the Net. Similarly, Hofstede's category of "power distance" points to the role of status in encouraging technology diffusion, as low-status persons seek to emulate high-status persons. Through these diverse forms of power, the language(s) and media of the Net may reshape the cultural assumptions of its globally-distributed users – thus raising the dangers of "computer-mediated colonisation" ("Disneyfication" – a la Cees Hamelink).

This biennial conference series aims to provide

an international forum for the presentation and discussion of cutting-edge research on how diverse cultural attitudes shape the implementation and use of information and communication technologies (ICT). "Cultural attitudes" here includes cultural values and communicative preferences that may be embedded in both the content and form of ICT – thus threatening to make ICT less the agent of a promised democratic global village and more an agent of cultural homogenisation and imperialism. The conference series brings together scholars from around the globe who provide diverse perspectives, both in terms of the specific culture(s) they highlight in their presentations and discussions, and in terms of the discipline(s) through which they approach the conference theme. The first conference in the series was held in London in 1998². An overview of the themes and presentations of CATaC'98, is on the web³. The second conference in the series was held in Perth in 2000⁴.

Original full papers (especially those which connect theoretical frameworks with specific examples of cultural values, practices, etc.) and short papers (e.g. describing current research projects and preliminary results) are invited. Papers should articulate the connections between specific cultural values as well as current and/or possible future communicative practices involving information and communication technologies. We seek papers which, taken together, will help readers, researchers, and practitioners of computer-mediated communication – especially in the service of "electronic democracy" – better understand the role of diverse cultural attitudes as hindering and/or furthering the implementation of global computer communications systems.

Topics of particular interest include but are not limited to:

- Impact of information and communication technologies on local and indigenous languages and cultures.
- Politics of the electronic global village in democratising or preserving hierarchy.
- Communicative attitudes and practices in industrialised and industrialising countries.
- Role of gender in cultural expectations regarding appropriate communicative behaviours.
- Ethical issues related to information and communication technologies, and the impact on culture and communication behaviours.

²(www.it.murdoch.edu.au/~sudweeks/catac98/)

³www.it.murdoch.edu.au/~sudweeks/catac98/01_ess.html

⁴(www.it.murdoch.edu.au/~sudweeks/catac00/)

- Issues of social justice raised by the dual problems of "the digital divide" and "computer-mediated colonisation," including theoretical and practical ways of overcoming these problems.

Submissions

All submissions will be peer reviewed by an international panel of scholars and researchers. There will be the opportunity for selected papers to appear in special issues of journals and a book. Papers in previous conferences have appeared in, for example, the Electronic Journal of Communication/La Revue Electronique de Communication, AI and Society Journal, Javnost-The Public, and New Media and Society. A book, Culture, Technology, Communication: towards an Intercultural Global Village, edited by Charles Ess with Fay Sudweeks, SUNY Press, New York, is due for release in July 2001.

Initial submissions are to be emailed as an attachment (Word, HTML, PDF) to:
catac@it.murdoch.edu.au.

Submission of a paper implies that it has not been submitted or published elsewhere. At least one author of each accepted paper is expected to present the paper at the conference.

Important Dates

Full papers: 15 March 2002

Short papers: 29 March 2002

Notification of acceptance: 5 April 2002

Final formatted papers: 26 April 2002

Conference co-chairs

Charles Ess, Drury University, USA
ejcrec@lib.drury.edu

Fay Sudweeks, Murdoch University, Australia
catac@it.murdoch.edu.au

Conference vice-chair

Lorna Heaton, University of Montreal, Canada:
lheaton@videotron.ca

CALL FOR PAPERS

ISA Research Committee on Sociology of Sport RC27

XV ISA World Congress of Sociology

Brisbane, Australia
July 7-13, 2002

Research Committee on Sociology of Sport RC27 invites proposals of papers for the sessions at the

XV ISA World Congress of Sociology to be held in Brisbane, Australia, July 7-13, 2002.

Send your proposal to the below listed sessions chairs before November 30, 2001.

Session 1: Globalization in sport: Analytical, theoretical and comparative issues

Chair: Christopher Hallinan, Australia:
christopher.hallinan@vu.edu.au

Session 2: World politics, global markets and the sportization of world society

Chair: Hans Peter Stamm, Switzerland:
hp.stamm@lssfb.ch

Session 3: Modern and post-modern perspectives on sport

Chair: Fabien Ohl, France:
fabien.ohl@umb.u-strasbg.fr

Session 4: Inequality in sport

Chair: Euhna Koh, Croatia:
ehkoh@snu.ac.kr

Session 5: Sport and gender

Chair: Cora Burnett Louw, South Africa:
cbbi@eb.rau.ac.za

Session 6: Sport and sexuality

Chair: Mari-Kristin Sisjord, Norway:
mari.kristin.disjord@nih.no

Session 7: Sport, exercise and health in a sociological perspective

Chair: Kari Fasting, Norway:
kari.fasting@nih.no

Session 8: Sport and media

Chair: Kevin Young, UK,
k.m.young@lboro.ac.uk

Session 9: Sport, politics and organisational issues

Chair: Bart Vanreusel, Belgium
bart.vanreusel@flok.kuleuven.ac.be

Session 10: Open papers/posters

Chair: Mari-Kristin Sisjord, Norway
mari.kristin.sisjord@nih.no

Special session 1: Leisure and sport

Joint session of RC13 Sociology of Leisure and RC27 Sociology of Sport

Chairs: Francis Lobo, Australia:

f.lobo@ecu.edu.au and

Mari-Kristin Sisjord, Norway:
mari.kristin.sisjord@nih.no

Call for Papers**RECONCILIATION THROUGH
COMMUNICATION****52nd Annual Conference of the
International Communication Association****Jointly Sponsored by the
Korean Society for Journalism and
Communication Study**

July 15–19, 2002 • SEOUL, KOREA

ICA's 2002 annual conference meets in the majestic city of Seoul, Korea, but its theme was launched in Australia in 2000. In the Sydney Olympics, athletes from North and South Korea touched people around the world by entering the Olympic Stadium under the same flag, offering a gesture of reconciliation between two countries that share not only a peninsula, but also a common linguistic and ethnic heritage and culture. One key to continued progress in normalization of relationships and rapprochement between South and North Korea is effective communication. To that end, this year's conference theme is "Reconciliation Through Communication."

This conference theme is offered as much more than a symbolic gesture. It is offered in recognition that a great deal of important communication scholarship in areas such as political communication, philosophy of communication, diversity and multiculturalism, conflict resolution, violence and aggression, technology and the digital divide, and cognate areas can contribute immeasurably to the level of understanding and accommodation necessary for reconciliation. Such research is useful in order for tensions to be eased and for peace to be established on the Korean Peninsula, and it is useful for understanding the deepest elements of symbolic interaction, as well as for improving our everyday lives. The vital role of judicious communication in reconciliation was illustrated quite dramatically by the dilemma that emerged in the aftermath of the collision of U.S. and Chinese aircraft over the South China Sea in the spring of 2001. Communication scholars around the world held their collective breaths as the leaders of the two nations scurried to learn and apply fundamental principles of conflict resolution through communication.

Reconciliation is sorely needed in numerous aspects of our discipline other than political communication, and this conference theme is offered as a challenge for ICA's members to productively address a number of other divides during our time together in Seoul, as well as in preconference and postconference meetings to be held in diverse locations throughout Southeast Asia. This includes the need for a ceasefire and appeasement in the battle over epistemological and methodological turfs, where collaboration offers so much more potential than do undermining and conflict. Major changes have taken place in some of our traditionally valued institutions, such as families. Conflicts between intimates have been a problem throughout history, but the stresses and complex lifestyles of modern times make domestic understanding a major challenge. Scholars with interests in family communication, interpersonal communication, organizational communication, and conflict resolution should be able to capitalize on the conference theme of "Reconciliation Through Communication" to provide new insights into what is required to address critical problems affecting domestic well-being and even tranquility.

Much of modern communication utilizes media technologies. For most scholars, our modern media appendages have greatly extended our reach. But these same enabling technologies can be disabling for those denied access to advanced communication systems and networks, who must compete as "have nots" against the "haves" in an increasingly challenging global marketplace. "Reconciliation Through Communication" includes the need to address numerous facets of the digital divide. These suggested opportunities for engaging the conference theme are meant to be illustrative rather than limiting. Your creativity in explicating and extending this conference theme is anticipated and welcomed. One special feature of the 52nd annual conference is that it is being cosponsored by the Korean Society for Journalism and Communication Studies (KSJCS), whose members and programs will be intermingled with those of ICA. The KSJCS Organizing Committee has been working with the ICA Steering Committee from the outset to plan this conference as well as preconference meetings and postconference excursions. This experience of having two organizations working together in a joint planning effort has presented a microcosm of the sort of understanding and fusion that we hope that the Seoul conference can achieve. We are also extremely grateful to the Korean American Com-

munication Association (KACA), whose officers have been instrumental in bringing this conference to the Eastern Pearl, and whose President serves on the ICA Steering Committee for this conference. As you begin to use the conference theme as a frame for the scholarship that you will share in Seoul in 2002, a bit of historical background on issues involved in reconciliation in a couple of critical areas of concern may be useful:

Korea's recorded past appeared as early as the 3rd century B.C., and its unitary history as a political entity began when Silla unified the country in 668 A.D. The last Korean dynasty, the Chosun Dynasty, was established in 1392 and endured for 518 years, until the beginning of the Japanese occupation in 1910. Japanese occupation ended in 1945, with the end of WWII. In 1948, two separate regimes emerged—the Republic of Korea (South Korea) and the Democratic People's Republic of Korea (North Korea). The Korean War began in 1950 and ended in 1953. It should be noted that the period of separation of the two Koreas due to ideological and political differences and conflict has been relatively short historically, less than 5% of the time of a unified Korea. Although many commentators think that a new horizon is emerging in progress toward a reunified Korea, a number of remaining issues potentially thwart reconciliation. Among them are disagreements about a national security law, current symbolic efforts such as family reunions by the two Koreas, and the nature of any new government that should lead a new (con)federation. Internet searches will reveal a number of sites, many in several languages, that provide dialogue for discourse analysis, public records for political communication analysis, and ample fodder for various forms of communication assessment regarding issues involving Korean efforts at reconciliation.

Toward Meaningful Dialogue Between East and West

During approximately the same historical period that Aristotle was beginning to theorize about communication in ancient Greece, knowledge about communication was building independently in the Far East. Broadly speaking, communication in ancient Asia was modeled on various philosophical systems, the most influential being Taoism and Confucianism, which emerged in China, and Buddhism, which emerged in India in the 6th century B.C. and then spread to other Asian countries.

Communication principles in Asia were deduced from philosophy rather than induced from practical needs at particular moments. The three major philosophies that developed in Asia in the 6th and 5th centuries B.C. established sets of beliefs that allowed for convergence toward a broad Asian model of communication oriented primarily inwardly rather than outwardly. The primary goal of communication in this generalized Asian model was knowledge of the self and of the essence of the world, rather than informing and influencing others or manipulating the external world.

Although Eastern and Western communication models have influenced each other increasingly, tremendous opportunities for productive dialogue and theoretical development exist from directly comparing transcendental, philosophical Eastern models with transactional, political Western models of communication. Breakthrough conceptualizations and research on the explication and potential integration of Eastern and Western communication models would be of particular value at the 52nd annual ICA conference. Contributions are invited on this and related topics, especially those spanning divisions and interest groups. Joint proposals from members of ICA and KSJCS or other Asian regional communication associations would be warmly welcomed. —J.B.

Conference Program Chair:

Jennings Bryant

Institute for Communication Research
College of Communication & Information Sciences
The University of Alabama
Tuscaloosa, AL 35487-0172
Voice: 205-348-1235 Fax: 205-348-9257
Email: jbryant@icr.ua.edu

To begin exploring the beautiful country of Korea in preparation for ICA's 2002 conference in Seoul, visit the Korean National Tourism booth (#2) at the Washington conference or consult these web sites:

<http://www.knto.or.kr>
<http://www.lifeinkorea.com>
<http://www.korea.insights.co.kr>
<http://www.koreatips.net>

Submitting Competitive Papers, Panels, or Other Proposals

ICA considers contributions to the conference in several different forms. To submit a paper, panel, or other proposal to ICA for possible presentation, you must first decide whether yours best fits the conference theme or one of the divisions or interest groups. Possible topics pertinent to the conference theme are described above, and instructions for submitting theme proposals are given in the next section. Papers or panels related to one of ICA's 17 divisions or interest groups are described below in the sections entitled "Divisions" and "Interest Groups."

IMPORTANT:

See the comprehensive instructions for papers, panels, proposals at: <http://www.icaheadq.org> and <http://www.icaheadq.org/2002Call2paper.pdf> *before* you prepare or submit anything for this conference.

Divisions

Information Systems

Completed papers and extended abstracts to:
Jennifer L. Monahan, Department of Speech Communication, Terrell Hall, University of Georgia, Athens, GA 30602.
Phone: 706-542-4893 • Fax: 706-542-3245
Email: jmonahan@arches.uga.edu

See <http://www.icaheadq.org/2002Call2paper.pdf> for submission guidelines for this division.

Mass Communication

Completed papers and panels to:
K. "Vish" Viswanath, PhD, Health Communication & Informatics Research Branch, Behavioral Research Program, Division of Cancer Control & Population Sciences, National Cancer Institute, 6130 Executive Blvd., EPN 4070, Bethesda, MD 20892-7363. [Rockville, MD 20852 - express mail]
Phone: 301-594-6644 • Fax: 301-480-2198
Email Address: viswanav@mail.nih.gov

The Mass Communication Division welcomes paper submissions on various topics, including research on factors that redefine the nature of mass communication and communication media, research that explains or explores effects of or interactions with media systems, and the changing role of mass communication in society, among other subjects.

New appraisals of mass communication theory are especially welcome, particularly those related to the conference theme's emphasis on reconciliation through communication. Research based on qualitative or quantitative approaches, as well as a range of theoretical approaches, including political economy and critical theory, are acceptable.

Interpersonal Communication

Completed papers and panel proposals to:
Laura Stafford
School of Journalism & Communication
3016 Derby Hall
154 N. Oval Mall
Ohio State University
Columbus, OH 43210 USA
Phone: 614-292-3400 • Fax: 614-292-2055
Email: stafford.3@osu.edu

This division is interested in papers and panel proposals that address communication processes and outcomes in a broadly construed view of interpersonal contexts, including relational, institutional, social, and cultural. Interest is in the fundamental means by which human beings create, express, interpret, and negotiate their communicative interactions with one another. Papers reflecting diverse theoretical perspectives and both quantitative and qualitative methodological approaches are encouraged. Papers may address pragmatic concerns, theory development, or both.

Organizational Communication

Completed papers only to:
Nosh Contractor, Speech Communication Department, University of Illinois, 244 Lincoln Hall, 702 S. Wright St., Urbana, IL 61801 USA.
Phone: 217-333-7780 • Fax: 217-244-1598
Email: nosh@uiuc.edu

The Organizational Communication Division (OCD) focuses on the description, analysis, understanding, and critique of communication practices in contemporary organizational life. The OCD is concerned not only with internal organizational affairs (such as supervisory-subordinate relations, employee socialization, worker participation, and media/technology usage), but also with interorganizational networks and the roles of the organization in the larger society. OCD members study organizations in all sectors of society (public, private, and independent) and adopt perspectives that include empirical, interpre-

tive, critical, and postmodern. The OCD is committed to the uses of multiple methodologies for data gathering and data analysis and especially to the triangulation of diverse and complementary research methods. Both theoretical and applied projects are encouraged. Topics of interest to OCD members range from micro-examinations of negotiation and bargaining tactics to macro-analyses of discourses of globalization. All these concerns, perspectives, and topics are appropriate for paper and panel submissions. The OCD welcomes submission of special panels and programs that truly will enhance multi-cultural and multinational interaction, moving the study of organizational communication beyond its accustomed domains. See the comprehensive instructions for papers, panels, proposals at:

<http://www.icahdq.org/2002Call2paper.pdf>

Intercultural & Development Communication

International & Development Communication

Completed papers and panel proposals to:

Karin Gwinn Wilkins, Department of Radio-TV-Film, University of Texas at Austin, CMA 6.118, Austin, TX 78712-1091 USA.

Phone: 512-471-2007 • Fax: 512-471-4077

Email: kwilkins@mail.utexas.edu

Intercultural Communication

Completed papers and panel proposals to:

Richard Wiseman, Speech Communication Department (CP-420), California State University, Fullerton, CA 92834-6868 USA

Phone: 714-278-3902 • Fax: 714-278-3377

Email: rwiseman@fullerton.edu

The Intercultural and Development Communication Division welcomes (1) full papers and (2) panel proposals across disciplinary and paradigmatic orthodoxies that focus on international, intercultural, and national development topics. Approximately 50% of papers and panel submissions are generally accepted based on review by at least three peers. Mail your submission to either Wilkins or Wiseman, depending on topic relevance.

Political Communication

Submit five (5) paper copies only to:

Christina Holtz-Bacha, Political Communication Division, j ICA Headquarters.

(Call or check website for new mailing address)

Email: christina.holtz-bacha@uni-mainz.de

The Political Communication Division supports research and theory development on the topic of politics and communication. The scope of this topic is broad, as political communication takes place in many settings, including within and between small groups and individuals, organizations, the media, cultures, and nations. Studies of communication in government, media, individual political figures, campaigns, and advocacy groups are all within the purview of this division. The division welcomes papers that address political communication problems at all levels of analysis using a variety of methodologies.

Instructional & Developmental Communication

Mail five copies to:

Patti M. Valkenburg, Instructional/Developmental Comm Div/ICA, Amsterdam School of Communications Research, University of Amsterdam, Oude Hoogstraat 24, 1012 CE Amsterdam, The Netherlands.

Phone: + 31 20 525 2348 • Fax: + 31 20 525 3681

Email: valkenburg@pscw.uva.nl

The Instructional and Developmental Communication Division is concerned with two broad areas: (1) communication related to any learning or instructional process, and (2) communication related to developmental processes across the life span. The division encourages papers and panel proposals that deal with either or both of these topic areas. Division members share a variety of research interests, including, but not restricted to, teacher-student interaction, teaching styles, instructional technology, the impact of mass media on children's development, the development of communication skills across the life span, and communication between generations across the life span.

Health Communication

Submit five (5) copies of completed papers to:

Michael Slater, Dept. of Journalism & Technical Communication, Colorado State University, Fort Collins, CO 80523 USA.

Phone: 970-491-5485 • Fax: 970-491-2908

Email: michael.slater@colostate.edu

The Health Communication Division is committed to excellence in research and theory development regarding health and communication. The applica-

tion of theory to health communication problems as well as the development of theory is of interest to the division. Communicating about health takes place intra-individually, interpersonally, within groups and networks, in health care settings, in the mass media, and in the society as a whole. The division welcomes papers that address health communication at all levels of analysis and that use either qualitative or quantitative methods.

Philosophy of Communication

Completed papers, extended abstracts, panels to:
John Nguyet Erni, Philosophy of Communication Division, ICA Headquarters.
(Call or check website for new mailing address)
Phone (in Hong Kong): +852-2788-9827
Fax (in Hong Kong): +852-2788-8894
Email: ENERNI@cityu.edu.hk

The Philosophy of Communication Division is interested in receiving papers concerned with theoretical, analytical, and political issues that cut across the various boundaries that are often taken for granted within the study of communication. Its primary goal is to provide a forum in which scholars can explore the relations and intersections between the study of communication and a wide range of contemporary philosophical concerns, arguments, and positions, as they are developed in various local, national, and international contexts. The division offers a lively forum for contemporary ideas, from cultural studies and postmodernism to semiotics and the philosophy of language to phenomenological and interpretive study of communication events. Given the conference's location in Seoul, Korea, we particularly welcome papers addressing issues of communication, globalization, cultural difference, political economy, and alternative modernities in diverse philosophical traditions. We also encourage collaboration between Asian and non-Asian scholars of communication.

Communication and Technology

Completed papers and panels to:
Teresa M. Harrison, ICA CAT Division, P. O. Box 57, Rotterdam Junction, NY 12150 USA
Phone: 518-276-8261 • Fax: 518-276-4092
Email: harrison@rpi.edu

The Communication and Technology Division is committed to excellence in research and theory development regarding the causes, consequences,

and/or context of old, present, and new communication technologies. Studies may focus on the intra-individual, inter-individual, small group, organizational, nation-state, or international levels of analysis. Papers need not be limited to classical communication paradigms. Papers that use disciplinary foci, including, but not limited to, economics, psychology, sociology, political science, information and computer science, and history, are welcomed. Likewise, all methodological approaches, including quantitative, qualitative, historical, critical, institutional, and humanistic, are encouraged. Papers reflecting the conference theme will receive special consideration. Authors should review and comply with general ICA guidance for competitive papers/proposals.

Public Relations

Completed papers and panels to:

Sherry Ferguson, Communication Department, University of Ottawa, 554 King Edward, Ottawa, Ontario K1N 6N5, CANADA.
Phone: 613-562-5800 ext. 3833 • Fax: 613-562-5240
Email: ferguson@uottawa.ca

The Public Relations Division encourages the submission of research papers (both faculty and student) and panel proposals (including theme sessions) that focus on the theory and practice of public relations.

Feminist Scholarship

Completed papers and panel proposals to:

Cynthia Carter, Cardiff University, JOMEC, Bute Bldg, Cardiff, Wales, CF10 3NB, UK.
Phone: +44 (0)29 20876172 • Fax: +44 (0)29 20238832
Email: cartercl@cardiff.ac.uk

The Feminist Scholarship Division is interested in receiving papers and panel proposals that explore the relationship of gender and communication, both mediated and non-mediated, within a context of feminist theories, methodologies, and practices. The division explores issues such as feminist pedagogy; international commonalities and differences by race, class, and gender; women's alternative media; and feminist cultural studies. Research papers must be complete in order to be considered. In addition to research papers, the division encourages the submis-

sion of panel proposals on current problems and issues in the field, from a feminist perspective.

Popular Communication

Five hard copies of completed papers and panels to: Jonathan David Tankel, PhD, Department of Communication, Indiana U-Purdue U Fort Wayne, Fort Wayne, IN 46805-1499 USA.

Phone: 219-481-5789 • Fax: 219-481-6183

Email: tankel@ipfw.edu

The Popular Communication Division is concerned with providing a forum for the scholarly investigation, analysis, and dialogue among communication researchers interested in popular communication and popular culture. Division members employ diverse theoretical approaches and methodological tools in exploring a wide range of artifacts, processes, effects, and meanings that are associated with the shaping of popular communication and popular culture. The group particularly values critical research that regards popular communication and popular culture as a locus from which to generate useful and provocative questions about everyday life. Submissions that address the conference theme are particularly welcomed.

Language & Social Interaction

Completed papers, extended abstracts, and panel proposals to:

Stuart Sigman, Dean, School of Communication, Emerson College, 120 Boylston St., Boston, MA 02116-4624 USA.

Phone: 617-824-8573 • Fax: 617-824-8569

Email: stuart_sigman@emerson.edu

The Language and Social Interaction Division welcomes submissions about the social uses or qualities of language, and/or the processes or structures of social interaction that either analyze data, pursue theoretical issues, or address methodological concerns. Research appropriate to the division may rely on either qualitative or quantitative data, and usually takes an approach grounded in the traditions of rhetorical analysis, ethnography of communication, conversation analysis, social psychology of language, discourse studies, narrative studies, linguistics (especially applied linguistics or sociolinguistics), or semiotics. Work that focuses on nonverbal aspects of interaction and speech is also appropriate.

Communication Law & Policy

Completed papers and panel proposals to:

Louise Benjamin, Department of Telecommunications, Sanford at Baldwin, University of Georgia, Athens, GA 30602 USA.

Phone: 706-542-5019

Fax: 706-542-2183 or 706-542-9273

Email: benjamin@arches.uga.edu

The Communication Law and Policy Division welcomes research from the full range of scholarly perspectives, including but not limited to legal, historical, empirical, ethnographic, critical, and cultural studies. The common element that connects researchers in this realm is a shared interest in observing, analyzing, explaining, and informing the law and policymaking process in communication systems. Studies may focus on policy perspectives within any country or internationally.

Interest Groups

Visual Communication

Completed papers, extended abstracts, and panel proposals to:

Catherine L. Preston, Department of Theater & Film, University of Kansas, Lawrence, KS 66045-2175, USA.

Phone: 785-749-1130 • FAX: 785-331-2671

Email: cpreston@ukans.edu

The Visual Communication Interest Group seeks to enhance the understanding of the visual in all its forms, from moving and still images and displays in television, video, and film, to art and design and print and digital media. The group provides a forum for the discussion of research in the creation, processing, function, meaning, and critical consequences of visual representation. Representing an area that touches on all other communication fields, investigating such areas as the interaction of the visual with public policy and law, mass communication processes, corporate image and organization, technology and human interaction, elite and popular culture, philosophy of communication, education, and the social sphere, the Visual Communication Interest Group welcomes interdisciplinary study as well as targeted analyses of all aspects of the visual communication experience.

Gay, Lesbian, Bisexual, & Transgender Studies

Completed papers, extended abstracts, and panel proposals to:

Sue A. Lanky, School of Journalism & Mass Communication, University of Iowa, Seashore Hall W608, Iowa City, IA 52242-1592 USA.

Phone: 319-335-3367 • FAX: 319-335-5210

email: sue-lafky@uiowa.edu

Gay, Lesbian, Bisexual, and Transgender Studies is concerned with the analysis and critique of sexual systems, discourses, and representations, particularly those that animate, inform, and impinge upon the lives of lesbian, gay, bisexual, and transgender people. Such systems and discourses occur in institutional, community, domestic, and intimate contexts; are closely connected to other social and cultural practices (such as nationalism, education, or popular entertainment); and play a critical role in the formation and communication of individual and group identity. Members also work with the ICA leadership to represent the concerns of lesbian, gay, bi-sexual, and transgender scholars in the Association.

Travel Grants

Travel grants to support minority students to attend ICA conferences were proposed by the Diversity Task Force and approved by the ICA Board of Directors in 1994. The grants are financed by a \$2 surcharge on each conference registration fee. To be considered for a travel grant, minority student members (African American, Hispanic/Latino/a, Native American, Pacific Islander) must indicate on their paper submissions to divisions and interest groups that they wish to be considered for a grant. Divisions and interest groups will be asked to submit one or two nominations to the Diversity Task Force, and grant recipients will be chosen from among these nominees. Typically, up to five grants of \$500 each will be awarded to students per year.

Conference Policies

Attendees from "soft currency" countries may apply for financial support for the cost of convention registration only. Please apply for consideration at the time papers are submitted by attaching a separate letter addressed to the program planner listed above.

Conference Registration Fee

As of 1993, ICA's Board of Directors removed conference fees as a benefit from all membership categories except Life Membership. Therefore, everyone except life members must pay the registration fee to participate in the conference.

Conference Secretariat

Michael L. Haley, International Communication Association, P.O. Box 9589, Austin, TX 78766 USA.

Phone: 512-454-8299 • Fax: 512-451-6270

Email: ica@icahdq.org

For further information about the 2002 conference, visit ICA's Internet website: <http://www.icahdq.org>. The website also provides information about ICA's history, its officers, publications, divisions and interest groups, current membership directory, and conference program and allows downloading of a membership application form or conference registration form.

International Conference on Questionnaire Development, Evaluation, and Testing Methods (QDET)

November 14-17, 2002

Radisson Hotel, Charleston, South Carolina

QDET will be the first international conference devoted exclusively to the methods used for questionnaire development, evaluation, and testing, and will bring together researchers and survey practitioners working in this area, to stimulate research papers that contribute to the science of reducing measurement error through questionnaire evaluation, to provide documentation of the current practices, and to stimulate new ideas for future practice.

Cognitive interviewing, behavior coding, interviewer/respondent debriefing, usability testing, split-sample experiments, psychometric analysis, establishment survey testing, question design for special populations, and questionnaire standards and practical issues.

General Questions about the Qdet Conference

Contact Jennifer Rothgeb:

Jennifer.m.rothgeb@census.gov

The QDET conference is sponsored by ASA/SRM, AAPOR, IASS, CASRO, and CMOR.

SPECIAL ISSUES

Social Science Computer Review

Volume 19, No. 3
Fall, 2001

Special Issue on the Simulation of Social Agents

The forthcoming fall issue of Social Science Computer Review, guest edited by David L. Sallach and Charles N. Macal, treats the growing field of social agent simulation. This e-mail contains an advance table of contents and is a call for further contributions on this topic, for which our journal seeks continued coverage.

For journal sample copies, contact:
jsamples@sagepub.com

Additional information, including style guide, is at <http://hcl.chass.ncsu.edu/sscore/> and at <http://www.sagepub.com/shopping/journal.asp?id=4706>

The Simulation of Social Agents: An Introduction. (David L. Sallach and Charles N. Macal)

Dynamics of Status Symbols and Social Complexity. (Roberto Pedone and Rosario Conte)

Studying Performance and Learning with ABIR: The Effects of Knowledge, Mobilizing Agents, and Predictability. (A. Maurits van der Veen, Ian S. Lustick, and Dan Miodownik)

Toward a Socio-generic Solution: Examining Language Formation Processes through Swarm Modeling. (Teresa Satterfield)

Simulation of the Learning of Norms. (Harko Verhagen)

Towards Strength and Stability: Agent-Based Modeling of Infrastructure Markets. (Michael J. North)

[Additional article not part of symposium]
The Impacts of Emoticons on Message Interpretation in Computer-Mediated Communication. (Joseph B. Walther and Kyle P. D'Addario)

Reports and Communications

The Acquisition of Computer-Aided Dispatch Systems: Administrative and Political Considerations.

(Dale Nesbary)
Resources for Computerized Crime Mapping
G. David Garson and Irvin Vann
Creativity-Aiding Software
Stuart Nagel
News and Notes
G. David Garson

Software Reviews

Latent Gold, reviewed by G. David Garson

Metanoia: A Fundamental Transformation of the Mind, reviewed by Pam Gauvreau

Book Reviews

Two Reviews of Science, Technology, and Democracy, by Daniel Lee Kleinman, ed.; reviewed by John W. Murphy and Carl Grafton

Mapping Cyberspace: Social Research on the Electronic Frontier, by Joseph Behar, ed.; reviewed by Carl Grafton

Human Services Technology: Understanding, Designing, and Implementing Computer and Internet Applications in the Social Sciences, Second Edition, by Dick Schoech; reviewed by G. David Garson

VBA for Modelers: Developing Decision Support Systems with Microsoft Excel, by S. Christian Albright; reviewed by Carl Grafton

SPECIAL ISSUE

The Information Society

<http://www.slis.indiana.edu/TIS>

Information and Communications Technologies (ICTs) and Community Networking

Guest Editor: Murali Venkatesh
Community & Information Technology Institute
School of Information Studies
Syracuse University
Syracuse New York 13244
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Manuscripts due: January 15, 2002

Even as the term "movement" is beginning to be applied to ICT-supported community networking to characterize an emergent body of concerns in the

research and practitioner communities worldwide, the terms “community,” “community network,” and “community networking,” and their relationship, are in need of clarification and definition. As a working definition, community networking refers to the process by which a community- focused technological system (an ICT- supported community network) develops and evolves in a geographically anchored, physical community. This special issue is interested in several aspects of this process, both as they relate to the development and evolution of the community network and of the idea of community itself. Although we are especially concerned in this special issue with the developmental process, research reports on outcomes from use of such networks in communities would be of interest as well.

There is a growing body of research on the consequences of the structuring and use of community networks on communication patterns, social relations, and collective action. This research is valuable and necessary. The process by which an ICT-supported community network is planned, designed, and implemented in a community has attracted relatively less critical attention. How and where does the idea of such a network originate in a community? How do residents and institutions mobilize around the idea, and why? Who participates and who does not in different aspects of its development, and why?

ICT-supported community networks can be powerful agents of community networking. As with technologies in general, they are shaped by social, political and economic choices. Such choices “are part of the history of a...system and are embedded in the social structure which support its (the technology’s) development and use” (Iacono & Kling, 1988). The term community networking highlights the process, and the play of social, political and economic systems and interests therein, which shapes these choices in a community. These choices, in turn, can have beneficial or detrimental (intended and unintended) consequences for community building and the idea of community. This special issue invites papers that offer nuanced description and analysis of ICT-supported community networking projects in communities worldwide. Papers on all forms of technologically-mediated community networking are welcome, ranging from development and use of telecenters in the developing world to so-called next generation community networking initiatives, featuring, among

others, broadband telecommunications technologies and/or localnets (Serra, 2000) – locally-focused segments of the Internet.

Topics of interest include but are not limited to:

- Participation and representation in community network development
- Relationships between the community network and the physical host community
- Community networking, community building and the communitarian ideal
- Political economy of community networking
- Community network governance
- Community networking and the Digital Divide
- Community networking as a tool for social and economic justice

Submissions may consider these and related issues from social science, philosophical, public policy and interdisciplinary perspectives. Submissions may be conceptual or empirical, and may employ quantitative, qualitative or case study approaches. We invite contributions both from researchers and practitioners. Submissions that relate findings and arguments to existing theory, or that clearly delineate implications for the development and refinement of theory, are strongly encouraged.

We encourage prospective authors to become familiar with TIS and to discuss possible articles with the Special Issue editor. Authors may email an abstract (1,500 words) to the Special Issue editor for comments. Deadline for receiving abstracts is October 30, 2001.

Manuscript guidelines and a list of the titles and abstracts of articles published in TIS can be found on the journal’s web site. Papers will be subject to the normal review process of The Information Society, and should follow the standard guidelines for submission to the journal. See information for authors at:

<http://www.slis.indiana.edu/TIS>

Please note in your submission letter that you want your manuscript to be reviewed for the Special Issue on “ICTs and Community Networking.” If you have questions or suggestions regarding the special issue, please correspond directly with the issue editor, Murali Venkatesh at: mvenkate@syr.edu.

Special Issue Editorial Team

Murali Venkatesh, Special Issue Editor
Peter Day, University of Brighton, U.K.
Fiorella De Cindio, University of Milan, Italy
Ceasar McDowell, MIT
Randal Pinkett, Ph.D. student, MIT Media Lab
Doug Schuler, Evergreen State College

Editorial Assistance

Dong Hee Shin, Ph.D., student, IST
Richard Southwick, Ph.D., student, IST

The Information Society is edited by Dr. Rob Kling,
Indiana University

JOB OPENINGS

Duke University

The Rachel Carson Professorship in Marine Affairs and Policy in the Nicholas School of Environment and Earth Sciences

The Nicholas School of Environment and Earth Sciences at Duke University, a multi-disciplinary School with undergraduate, professional masters and Ph.D. programs, invites applications for the Rachel Carson Chair in Marine Affairs and Policy, a tenure-track position. This position, to be based at the Duke University Marine Laboratory in Beaufort, NC, is open to candidates with a Ph.D. in one of the environmental social sciences, with a preference for assistant or associate level candidates. Applicants should have an extramurally funded research program; strong background in the application of both quantitative and qualitative social science research methods; teaching ability at both the undergraduate and graduate levels; and a strong field research orientation. Research themes could include, but are not limited to, resource management, the policy-making process, socio-cultural aspects of coastal constituencies, or comparative international policy regimes. In addition, candidates should have a demonstrated interest in applications of social science to contemporary coastal and marine issues.

It is our intention to fill this position for the fall of 2002, and we will begin reviewing applications on November 1, 2001. A letter of interest, curriculum vitae, and the names of three references should be sent to:

Dr. Michael K. Orbach
Chair, Rachel Carson Chair Search Committee
Duke University Marine Laboratory
135 Duke Marine Lab Road
Beaufort, NC 28516-9721

Duke University is an equal opportunity employer. For more information about the Nicholas School of the Environment and Earth Sciences and the Duke University Marine Laboratory, please see our website at: <http://www.env.duke.edu>

McMaster University

The Department of Political Science, in conjunction with the Programme in Communication Studies, invites applications for a tenure-track position at the Assistant Professor level commencing July 1, 2002. The Department seeks candidates in Political Theory and Communication Studies. In Political Theory, the successful applicant will be required to teach at both the graduate and undergraduate levels and to participate in the Department's Ph.D. programme. In Communication Studies, he/she should have the ability to teach the introductory course and upper-level undergraduate courses. Communication Studies is a new interdisciplinary programme which was introduced in September 2001. The candidate should also have a completed Ph.D. or be near completion. Outstanding research and teaching potential are necessary qualifications for this position. The Department expects the person who takes up the position to engage in an independent research programme yielding significant peer-reviewed publications.

Applications, including a CV, three academic letters of reference, and a copy of a recent publication or paper, should be sent to:

Dr. Richard Stubbs, Chair
Department of Political Science
McMaster University
1280 Main Street West
Hamilton, Ontario L8S 4M4

Canadian citizens and permanent residents will be considered first for this position. McMaster University is committed to employment equity and encourages applications from all qualified candidates, including aboriginal peoples, persons with disabilities, members of visible minorities and women.

Deadline for applications: January 4, 2002

University of Groningen

At the Department of Sociology of the University of Groningen, there is a vacancy for a Full Professor in Sociology, specifically Research Methodology .

The Department is part of the Faculty of Social and Behavioral Sciences. The Department of Sociology is responsible for the Bachelor's and Master's degrees in sociology. The research of the department is part of the Interuniversity Center for Social Science Theory and Methodology (ICS). The ICS is a Research and Graduate School recognized by the Royal Netherlands Academy of Arts and Sciences, with the University of Groningen as the managing partner, and Utrecht University and the University of Nijmegen as other partners. The ICS has been appointed a Marie Curie Training Site by the European Commission.

The Department is oriented toward systematic theory elaboration (when possible using mathematical models), empirical testing of these models (when possible using advanced statistical models), and the development of theories and techniques for policy analysis and social intervention. At present these theories and models are directed especially at interventions in organisations, labor markets, school systems, informal support networks in health care, and collective decision making.

The vacancy

In the Department of Sociology, successors for three full professors are sought in a period of a few years, while the present professors will remain working part time for some years. The three new professors must have partly overlapping competencies in systematic theory elaboration, research methodology, and policy analysis directed toward social intervention. The present vacancy is the second in the row, after filling the vacancy in Sociological Theory. A professor is sought who will contribute to the continuation of the high quality of the Department and the Research and Graduate School ICS.

The new full professor:

- < will contribute to the Bachelor's and Master's curricula
- < will contribute to integration and innovation in the sociology curriculum, especially in the field of Research Methodology

- < will contribute within the context of the ICS Research Program to the development of models and methods for theoretically guided social interventions, especially in the domains of problems of coordination and cooperation, and problems of the evolution and maintenance of solidary behavior is expected to develop one or several highly innovative research programmes which will provide a context for the research by PhD students and postdocs
- < is expected to play a leading role in the ICS as a member of the ICS Board and one of the possible future Scientific Directors.

Profile

- < PhD in sociology, statistics, or related discipline
- < publications in important international journals on Social Research Methodology, preferably in at least two of the following domains:
 - C development of innovative designs and techniques of data collection
 - C development and/or application of statistical models that are integrated with theoretical models
 - C development of measurement models for important social science concepts
 - C development and/or application of research methods for social intervention and policy analysis
- < development and/or application of theory-guided empirical research or social interventions in one of the following areas of application is desirable: organisations, labor markets, school systems, informal support networks in health care, and collective decision making
- < dedication to, and experience with teaching research methods
- < succesful experience with acquiring external research funding
- < a good network of contacts
- < good management qualities.

Information

Information can be obtained from the chairman of the search committee:

Prof.dr. Tom A.B. Snijders,
tel. +31-50-3636188,
email t.a.b.snijders@ppsw.rug.nl

The structure report on the vacant chair can be accessed at:

<http://stat.gamma.rug.nl/snijders/StrucRapMenT.html>

More information about the ICS can be found at internet page: <http://www.ics-graduateschool.nl/>

Interested persons are requested to send a letter of application, with a CV and three relevant publications, to:

Rijksuniversiteit Groningen,
Afdeling Personeel & Organisatie ,
Postbus 72, 9700 AB Groningen.

The number of this vacancy is: 201184, please mention this number on the envelope and on top of your letter.

Closing date: October 24, 2001.

Tom A.B. Snijders, ICS
Dept. of Statistics, Measurement Theory, and
Information Technology
University of Groningen
Grote Kruisstraat 2/1
9712 TS Groningen
The Netherlands

University of Osnabrück

The Institute for Environmental Systems Science, Department of Mathematics and Computer Science, at the University of Osnabrück, invites applications for a RESEARCH ASSOCIATE (salary group C1) at the new chair of "Management of resource flows" where innovative concepts for managing transformation processes towards sustainability are developed with an emphasis on an improved understanding of dynamics and management of actor networks and the development of flow based indicators for environmental, economic and social sustainability.

Research will be developed in close exchange with industry and public authorities. The successful candidate will build up a research group on modeling and analysing the dynamics and organization of social networks. Of interest are investigations on the quantification of social capital, the importance of social embeddedness and structural organization for the economic performance of organizations and companies, the development of network concepts bridging disciplines. Participation in the teaching of students in systems science is expected.

Candidates should hold a PhD in computer science, social science, economics or a related field. The

position corresponds to an assistant professor appointment and is limited to a period of five years.

The University of Osnabrück is an equal opportunity employer and encourages applications from women.

Prof. Claudia Pahl-Wostl (currently in Switzerland), Swiss Federal Institute of Environmental Science and Technology (EAWAG), Überlandstr. 133, CH-8600 Dübendorf.
pahl@eawag.ch
phone 0041 1 8235542

Unique Employment Opportunity

Attn: the president

Compliments of the season. Grace and peace and love From this part of the Atlantic to you. I hope my Letter does not cause you too much embarrassment as I Write to you in good faith. Based on the contact Address given to me by a friend who works at the Nigerian embassy in your country. Please excuse my Intrusion into your private life.

I am barrister Abu Dada, I represent Mohammed Abaca, Son of the late Gen. Sani Abacha, who was the former Military head of state in Nigeria. He died in 1998.

Since his death, the family has been loosing a lot of Money due to vindictive government officials who are Bent on dealing with the family. Based on this Therefore, the family has asked me to seek for a Foreign partner who can work with us as to move out The total sum of US \$75,000,000.00 (seventy five Million united states dollars), presently in their Possession. This money was of course, acquired by the Late president and is now kept secretly by the family.

The Swiss government has already frozen all the Accounts of the family in Switzerland, and some other Countries would soon follow to do the same. This bid by some government officials to deal with this family has made it necessary that we seek your assistance in receiving this money and in investing it on behalf of The family.

This must be a joint venture transaction and we must All work together. Since this money is still cash, Extra security measures have been taken to

protect it from theft or seizure, pending when agreement is reached on when and how to move it into any of your Nominated bank accounts. I have personally worked out All modalities for the peaceful conclusion of this Transaction. The transaction definitely would be handled in phases and the first phase will involve the Moving of US \$25,000,000. (twenty five million United States dollars).

My clients are willing to give you a reasonable Percentage of this money as soon as the transaction is concluded. I will, however, based on the grounds that You are willing to work with us and also all contentious issues discussed before the commencement of this transaction. You may also discuss your percentage before we start to work. As soon as I hear from you, I will give you all necessary details as to How we intend to carry out the whole transaction.

Please, do not entertain any fears, as all necessary Modalities are in place, and I assure you of all Success and safety in this transaction.

Please, this transaction requires absolute confidentiality and you would be expected to treat it as such until the funds are moved out of this country.

Please, you will also ignore this letter and respect Our trust in you by not exposing this transaction, even If you are not interested.

I look forwards to working with you.

Thank you.

Truly yours
Barrister Abu Dada .

It's a Small World, eh?

Dear Sir,

I would like to firstly send to you the best wishes of good health and success in your pursuits.

I am a senior official of the West Africa Project Contracts Consortium of my country. There is a pending business transaction of interest which I would like to execute with you. I have been mandated, as a matter of trust by my colleagues who are part of the project, to look for a reliable overseas partner to assist us in the execution of this transaction. That is why I am sending you this e-mail.

We also wish to invest in foreign stock markets, Estates and other businesses in your country, your advise and assistance will be required as I already plan to visit you in the next couple of weeks hopefully after the successful completion of the transaction. I am looking forward to doing this transaction with you and I solicit your utmost confidence and trust.

Please acknowledge the receipt of this e-mail by using the above e-mail address so that I can bring you into a more detailed picture of this transaction when I hear from you.

Best regards,
ARCH. JOSEPH ADEBAYO

Editor's note: *there is some doubt about the validity of the last two positions on the above list. Caution is advised.*



Ties & Bonds

BBS [*Barry's Bulletin-Board Service*]

Peter Monge (Annenberg, USC) chair of Finance Committee of Int'l Communication Assoc.... **Joe Galaskiewicz** going from U Minnesota to Soc, U Arizona, Summer 01.... **Mike Timberlake** leaving Manhattan (Kansas State U @) for U Utah, Summer 01.... **David Gibson** is now Asst Prof of Soc, Harvard.... **Devon Brewer** stays in Seattle, but now at Harborview Medical Center, doing STD health-network research **Michael Schwartz** has taken early retirement from Soc, SUNY-Stony Brook. He recently sold his movie marketing business to *Variety* but continues as a consultant to them... **Mario Diani** has moved from the Chair at Strathclyde, Scotland to one at Soc, Trento, Italy.... **Manuel Castells** (Soc, Berkeley) spending 2001-2002 academic year at Open U of Catalonia, Barcelona **Emmanuel Koku** appointed Research Officer by Toronto Dept of Health to analyze sexual networks....

.... **Paul Bernard** and **Barry Wellman** 2/5 of the recipients of the Canadian Sociology and Anthropology Association's "Outstanding Contribution Award," 2001.... **Barbara Laslett** (Soc, Minn) has won the Amer Soc Assoc's Jessie Bernard Award for scholarly work that has encompassed the role of women in society.... **Kathleen Carley** (Carnegie Mellon) 2001 winner of Amer Soc Assoc's Sociology and Computing section's prize for outstanding achievement.... **Carter Butts** (Carnegie Mellon) and **Joy Pixley** won the Amer Soc Assoc's Aging and the Life Course best student paper prize (2001) for "Analyzing Life Course Patterns with the Interval Graph Approach." Bronfenbrenner Life Course Center Working Paper 01-10, Cornell University....

.... **Susan Bastani** (back being a sociology prof at Alzahra U, Tehran) and **Keith Hampton** (Urban Studies, MIT) successfully defend dissertations at U Toronto Soc.... **Bonnie Nardi** moved from ATT Labs to Agilent Labs, Palo Alto CA, Jan01 to study the work practices & networks of molecular biologists.... **Chad Gordon** retired at Rice U Soc. (Some details in Short Schticks below).... **Peter Marsden** (Harvard) & **Victor Nee** nominated for Amer. Sociological Assoc Council.... **Yanjie Bien** appointed Assoc Dean at Hong Kong U of Sci & Tech.... **Gustavo Mesch** elected chair of Soc, Haifa.... **Caroline Haythornthwaite** (Info Sci, U Illinois) nominated for vice-chair of Int'l Comm Assoc's Communications and Technology Div....

Networked Reading

I've had a wonderful time reading Bruce Sterling's science-fiction novel, *Distraction* (NY: Bantam, 1998). It's about a U.S. as a rather chaotic, perhaps dystopian, networked society in 2044. Densely-knit groups are called krewes, named after the New Orleans Mardi Gras groups. The Internet has just become the net, seamlessly integrated into life. "We don't have roots. We're network people. We have aerials." (p. 491). Formal structures are disintegrating, being replaced by amorphous, ever-changing, self-organizing hordes. It's "basically a semifederal, semilegal, distributable-deniable, net-centered segmented polycephalous influence sociality process." (p. 498). Status in such hordes is gained thru earning points in "reputation servers," such as Pattie Maes (MIT Media Lab) and Marc Smith (Microsoft Research; INSNA member) are developing now.

You show up at a Regulator camp with trust rep in the high nineties, people will make it their business to look after you. Because they know for a fact that you're a good guy to have around. You're polite, you don't rob stuff, they can trust you with their kids, their cars, whatever they got. You're a certifiable good neighbor. You always pitch in. You always do people favors. You never sell out the gang. It's a network gift economy. (p. 256).

Another provocative novel is *The Intuitionist*, by Colson Whitehead (NY: Anchor, 1999). It has elevator inspectors as the key figures in society, because they facilitate vertical movement. The inspectors are divided into two camps: the Empiricists, who assemble a lot of discrete facts about an elevator's operation, and the Intuitionists, who *gestalt* it. The error rates apparently are similar. The intuitionist heroine is the first black woman to have become an inspector. The author himself is black, and the book is clearly into racial stratification, both literally and metaphorically. However, the author also went to Harvard, and I kept wondering what social science courses he took. Certainly not dustbowl empiricism. **Book review:** The idea is more interesting than its working out, although Whitehead's writing itself is dazzling. A skim through Amazon shows mixed reader reaction.

Just Desserts

Noshir Contractor (U Illinois) has had a banner summer. **Nosh** married Maria Mastronardi, Asst Prof at U Illinois-Chicago, 7/01 in a Parsee service (the wedding pix is charming)..... Maria is now appointed at the U IL Champaign-Urbana campus... Nosh has also been promoted to Full Prof and has been selected to be chair of Int'l Comm Assoc's Web Services advisory committee – because he knows where to find info...

Janet Salaff (Soc, U Toronto) and **Arent Greve** (Bus Schl, U Bergen, Norway) were married 22Aug01 on Malibu Beach (L.A.) right after the Am Soc meetings. Janet & Arent couldn't wait for the Sunbelt even though they first met at one. Arent says he first spotted Janet dancing up a storm at the Bev Wellman choreographed

ending to my New Orleans keynote. But they didn't actually meet until a mid-afternoon break at a subsequent Charleston meeting. Now you know why we require Jacuzzis for all our conferences. INSNA is a Total Service Association. **Jim March** (Bus, Stanford) conducted a bravura ceremony on the beach. **Bev and Barry Wellman** were the "best friends". Barry made the toast, and Bev led a snake and circle dance on the beach. Participants included networkers Leslie Howard (Whittier Soc) and Ivan Light (UCLA Soc), and much of Toronto's NetLab: Wenhong Chen, Dima Dimitrova, Melissa Kew.

Karen Stephenson appears to have carved out a remunerative career as a network-oriented organizational consultant. Here's the blurb from Neoconcanada about her keynote: "Today's organizations consist of visible hierarchies and also invisible, overlooked networks thru which much communication and knowledge are actually transmitted. Cultural anthropologist Karen Stephenson, *considered the world's foremost authority on scientific network analysis* [my ital], uncovers the naturally occurring informal networks where work really gets done, or where creativity goes to die. She is adept at identifying the key – altho not necessarily highly ranked – people crucial in implementing successful innovation whose energy and intellect can be harnessed to drive up profits. Thru her company, NetForm, Dr. Stephenson's consulting has resulted in performance turnarounds at over 300 organizations. [www.merchandisemart.com/neoconcanada/keynote.html]

Barry Wellman (hey, that's me) was honored by U Toronto with a celebratory "Barryfest" conference (4/01). It featured talks by Stan Lieberman, June Corman, Liviana Calzavara, Bonnie Erickson, Dean Behrens, Scot Wortley, Keith Hampton, Caroline Haythornthwaite, Anabel Quan-Haase, Bev Wellman, and You Know How. Plus a poem by Chuck Tilly, and assorted slanders from correspondents around the world. (For details, see the Barryfest portion of www.chass.utoronto.ca/~wellman). Nope, I ain't retiring. My Soc chair, Lorne Tepperman, got inspired to hold this because of the Canadian award I won (see above).

Short Schticks

Competitiveness: Lawyer David Boies was the lead lawyer for the US Justice Dept's initially-successful case to break up Microsoft. He also was the lead lawyer for Al Gore's fight to gain the Presidency. My favorite Boies-ism is: "Would you rather sleep or win?" The Microsoft trial hinged to a significant extent on what the economists call "network effects": Basically, if everyone is using products like *MS-Word*, you also have to, even if you know that *Word Perfect* is better. I still use WP to write but then send to the heathen with a conversion program that translates into .doc treyfe. Nevertheless, MS wins, because I've bought the inferior *Word* for convenience in reading the documents that others send to me. [Source: The wonderful article by John Heilemann, "The Truth, The Whole Truth and Nothing But the Truth: The Untold Story of the Microsoft Antitrust case." *Wired*, Nov 2000].

Chad Gordon (see BBS above for retirement news) was my dissertation supervisor at Harvard. Although Chad was best known as a student of Harold Garfinkel, he was quite open to quantitative analysis and the social network approach. (My quantitative dissertation on the self-concept of [Pittsburgh] black and white adolescents originally envisaged a social network / reference group component that got dropped for lack of time and space.). Chad retired 5/99 from Rice U's Sociology dept. Here's what they wrote about him:

The road to Rice for Gordon ran through Hollywood (California) High School in the early '50s and Harvard University in the '60s. The bicoastal influences on his career at Rice – which included being named the first chair of the university's sociology department – can't be missed: During the '70s he led a rock band aptly named "Chi Square and the Degrees of Freedom"; spearheaded a search for the hottest food in the city through the auspices of the "Hot Food Club"; and taught courses on topics ranging from "death and dying" to "sexuality and the social order" (commonly known as "Sex with Chad").

"When word began to spread that Chad was retiring, students appealed to the sociology department to try to get him to stay on,

noting that they consider it a vital part of their education to take one of his courses," said fellow sociology professor Bill Martin. "At the last meeting of his sexuality class, members of the department each made a statement about his contributions over the years, and the students presented him with a huge poster they had signed with the central message being 'I had Sex with Chad and it was good for me.'"

[Source: <http://riceinfo.rice.edu/projects/reno/rn/19990513/emeriti.html>]

The Writer's Block Calendar is published by the University of Victoria (BC, Canada) English Dept's Kim Blank and Michael Cullen. Here are some thoughts for the day from a recent version [Source: University Affairs, 12/00: 7]

- "A bunch of little words in a row often means some can go"
- "When you edit your work, pretend it was written by someone you don't like."
- "If things happen 'on a daily basis', it means they happen 'daily'"

Ron Burt's Sources Revealed: Did the wise ones in ancient China understand structural holes? From the *Tao Te Ching*, # 11

Thirty spokes join together in the hub.

It is because of what is not there that the wheel is useful.

Clay is formed into a vessel.

It is because of its emptiness that the vessel is useful.

Cut doors and windows to make a room.

It is because of its emptiness that the room is useful.

Therefore, what is present is used for profit.

But it is in absence that there is usefulness.

[Source: Valdis Krebs' email to SocNet, 18 Dec00. Translation by Charles Muller. <http://www.human.toyogakuen-u.ac.jp/~acmuller/contao/lao-tzu.htm>]

Sponsorship: A Hot New Way to Support Your Research: You may have read the story about novelist Fay Weldon getting sponsorship from Bulgari jewelers for her latest book. I too want product placement gelt. If it's good for

novelists and hockey rinks, it should be good enough for *Social Networks*! So here's part of my next paper:

Google.com shows me that technological change has enabled dispersed community. People use their Nokia phones together with MCI's Friends and Family to hear each other's voices. AOL helps fill in the gaps with text messages – including the hot new Instant Messaging feature – while the annual urge to actually see and touch someone can be satisfied by the ultimate driving machine – BMW – or by flying the friendly skies of United. Motorists who want to watch their significant other and the road at the same time, have been rushing to pre-order (using their Visa cards on Amazon) Palm's new video kit, complete with Xybernaut's nifty heads-up display. Some cognoscenti even toast each other with Chateau Montelena.

The Life Cycle of Authorhood

1. **Birth** – the idea for the book
2. **Childhood** – thinking about what will be in it.
3. **Early Adulthood** – actually sitting down and doing the work
4. **Modern Maturity** – your friends tell you the manuscript has serious problems
5. **Shopping** – finding an agent
6. **Ambivalence** – publisher conditionally accepts it
7. **Gang Rape** – referees' and editors' comments arrive
8. **The Morning After** – dealing with the comments
9. **Joy** – publisher accepts revised manuscript
10. **Déjà Vu** – reading page proofs and doing the index
11. **Masturbation** – writing the "About the Author" book jacket blurb
12. **Bad Hair Day** – publisher's design for book jacket arrives: your artistic design has been replaced by clip art
13. **Triumph** – book appears: your name is in lights at Amazon
14. **Less Than Jackie Collins** – you give a copy to your parents: they put it under the newspaper pile and forget to look at it
15. **Nausea** – opening the book to bask in its glow and discovering a glaring mistake
16. **Divorce** – your editor leaves your publisher just before marketing begins
17. **Betrayal** – publisher forgets to bring your book to the convention. Book notice appears in small print at the back of the publisher's catalogue
18. **Sold Out** – your publisher is bought by a big conglomerate for its journal list: their editors and book reps never heard of your book, couldn't care less, and computer incompatibility means their warehouses can't find it when anyone orders it
19. **Jungle Fever** – Amazon.com initially doesn't list your book, and then says it is back ordered with a long wait
20. **Fumble** – when people want to discuss your book, you forget what's in it because you wrote it so long ago
21. **Outrage** – first reviews come out
22. **Satisfaction** – better reviews come out
23. **Dom Perignon** – first royalty check arrives
24. **Fame** – web search on book title gets 4,000 hits
25. **Disappointment** – 10 of the first 20 links you follow from the search get you wrong
26. **Stardom** – book tour, interviewed by Oprah, optioned by Spielberg
27. **Infirmity** – hospitalized, suffering from exhaustion
28. **Sterilization** – no third printing; goes out of print
29. **Senility** – remaindered for \$2.95
30. **Death** – by pulping
31. **You Can't Go Home Again** – you meet original editor at party and she asks, "whatever happened to that manuscript of yours?"
32. **Resurrection** – signed author's copies on eBay for \$99.95

Note: Just about every one of these things has happened to me or to people I know.

© Barry Wellman July 2001

Estimating the Ripple Effect of a Disaster¹

H. Russell Bernard

Department of Anthropology, University of Florida, USA

Peter D. Killworth

Southampton Oceanography Centre, Southampton, UK

Eugene C. Johnsen

Department of Mathematics, University of California–Santa Barbara, USA

Gene A. Shelley

Georgia State University, USA

Christopher McCarty

Bureau of Business and Economic Research, University of Florida, USA

*We apply our network scale-up model to estimate the number of people in the U.S. who **know someone** who experienced the terrorist attacks of September 11, 2001 and the number of people who **know someone who knows someone** who experienced those attacks.*

INTRODUCTION

On Tuesday, September 11, 2001, Bernard got a call from a reporter asking: “Are you the same person who studied the Mexico City earthquake?” The reporter wanted to know how many people in the U.S. would be affected directly by the attack on the World Trade Center and the Pentagon. What he meant by “directly” was this: How many people know someone who worked at the World Trade Center or at the Pentagon or who were on those four planes on September 11, 2001? And further: How many people know someone who knows someone who experienced the attack? Could this, he asked, be worked out as a kind of six-degrees-of-separation problem?

Yes, it can, but there are at least three ways to define the population of people who experienced the attack. First, there are those who are usually present at the sites of the attacks at some time or other during the week (this includes people who regularly take those flights); this is about 50,000. Second, there are the people who were actually present at the sites at the time of the attacks. This is about 20,000. And third, there are those of the 50,000 who are missing, estimated at the time of this writing (9/22/01) to be 6,333.

¹ We acknowledge with gratitude the support of the U.S. National Science Foundation for our work on the network scale-up method (grant SBR-9710353).

THE MODEL

We used our network scale-up model to work out the numbers. The model is simply $m' c = e' t$, where:

- e is the size of the event population, here 50,000, 20,000 or 6,333
- t is the size of the population within which the members of e are embedded, which in this case is the total U.S. population;
- c is the average size of a personal social network among members of the t which, from our recent work, we estimate to be 290 for the U.S., and
- m is the average number of people in e whom people in t know.

When we first developed our model, it was to estimate the size of hard-to-count populations, but the reporter who called Bernard made clear that in this case, the numbers of interest to his readers were (a) the number of people who *know someone* in e and (b) the number of people who *know someone* who *knows someone* in e . We'll call these n_1 and n_2 .

Our working definition of "A knows B" means that A knows B by sight or by name; that A can contact B in person by telephone or by mail; and that A has had contact with B in the past two years. Over the last 15 years, we've done several national studies to determine c for the U.S. We call a representative sample of people across the country and ask them how many people they know in 29 populations whose sizes we know. Examples of those populations are: people named Nicole, American Indians, people who hold a commercial pilot's license, and people on dialysis.

From their answers, we use a back estimation technique to estimate c for each person—that is, the number of people they must know in order to produce as closely as possible the patterns of answers to our questions about how many people they know in those 29 known-size populations. (For a review of the model, its variants and its tests, see Bernard et al.1989; Bernard et al.1991; Johnsen et al.1995; Killworth and Johnsen et al.1998; Killworth and McCarty et al.1998; McCarty et al.1997; McCarty et al.2001; Shelley et al.1995.)

Across five such surveys, the number for c is 290, plus or minus just a few people. We plug this estimate for average personal network size into the network scale-up model and estimate the number of people in each of those same 29 populations. Since we know the number of people in those populations, we can see how well the model is doing. We estimate about a dozen of these populations reasonably well, but we seriously underestimate or overestimate others. Our program of research involves testing confounds and trying to improve our estimates for populations, like suicides, that we miss by a lot.

We also use our model for its original purpose, to estimate the size of hard-to-count populations. Our estimates for the number of HIV-positive people, the number of rape victims, and the number of homeless in the U.S. track closely with estimates made by others. Our answers are thus reliable, but not necessarily valid. We might simply be mirroring the incorrect answers produced by others who happen to use quite different methods to measure these same things. One thing we do know: Our estimates of the number of HIV-positives, the number of rape victims, and the number of homeless cost very little to produce, compared to other methods currently used.

Estimating m

With appropriate caution, we can use the network scale-up model to answer the reporter's questions: How many people would be one or two links away from people who did or could have experienced the attacks on September 11, 2001? Assuming that 50,000 people could have experienced the attacks at the World Trade Center or the Pentagon or on the hijacked planes that day; that 20,000 actually had experienced the attacks; that about 6,333 are currently missing and presumed to have died; and

assuming t is about 250 million, m would be, respectively, about 0.058, 0.023, or 0.0073, to two significant figures. (We'll quote estimates from here on out to two significant figures.)

That is, across the U.S., each person knows, respectively, about 0.058, 0.023 or 0.0073 of a person who experienced, in one way or another, the calamity of September 11th. (We use $t = 250$ million because that was the approximate population of the U.S. when we developed and tested the model and obtained the figure of $c = 290$.) We expect the distribution of answers across the U.S. to the question "How many do you know who experienced the attack on the WTC or the Pentagon on September 11th?" to consist largely of 1s and 0s, so we might treat the above m values as proportions, in which case about one person in 17, 43, or 140, respectively, knows someone who experienced the attack in one way or another.

We know, however, that if someone knows someone in a population they will tend to know others in the population, and this will almost certainly be true for those living in the New York City and Washington, D.C., metropolitan areas. We represent this by a "lead-in" factor, δ , which is the average number of members of a population known by those who know at least one member of the population. In general $\delta > 1.0$, so including this factor in our calculations should improve our estimates of m .

In previous work (Johnsen et al. 1995), based on General Social Survey data, we obtained lead-in factors for the populations of homicides, suicides, and AIDS victims of about 1.60, 1.26, and 1.75, respectively. The relatively low figure for suicides points to the relative social isolation and stigmatization of those who commit suicide, while the relatively high figure for AIDS reflects the relatively high social cohesiveness of those afflicted with AIDS despite stigmatization. We think that the figure for homicides reflects the fact that this is a population that is neither stigmatized nor uninteresting and that is generally not a cohesive group (though their survivors might be). We think that people who experienced the attack of September 11 are in this category, so we assume a lead-in factor of 1.60 for these populations.

Estimating n_1 and n_2

Using the lead-in factor, we can calculate n_1 and n_2 — that is, the number of people who know people in e and the number of people who know people who know people in e . The effect of the lead-in factor is to decrease n_1 and so we have $n_1 \delta = mt = ce$. From this analysis, one person in about 28, 69, or 220, respectively, knows someone who experienced the attack and so, our estimates for the three possible populations affected by the attack are 9.1 million, 3.6 million, and 1.1 million.

To answer the reporter's next question, we take the analysis another step, using the three populations of n_1 members from the first step. Thus, the number of people who know someone who knows someone who experienced the attack on September 11th is about $n_2 = c^2 e / \delta^2$.

We justify the use of the same δ here by assuming that these three populations are of the same type as the e and the homicides. Thus, at two steps removed in the network chain from the disaster, about 1.6 billion, 660 million, or 210 million, respectively, know someone who knows someone who experienced the horror of September 11th, 2001. (The formulas for n_1 and n_2 are approximate, but obvious corrections to them have little effect on the results.)

The first two figures exceed the population of the U.S., so practically everyone in the U.S. knows someone who knows someone who was in the 50,000 or 20,000 who experienced the attack. The third figure says that about 83% of the U.S. population is two steps removed from the 6,333 who are currently thought to have died in the attack. Without the repeated lead-in factor, the third figure of 210 million becomes 530 million, which indicates that practically everyone in the U.S. knows someone who knows someone in the 6,333.

Here we have analyzed the ripple effect of knowing people and knowing people who know people; however, knowing a person who experienced the attack is not the same as knowing that that person experienced the attack. This flow of information — finding out that people whom we know, or have heard of, experienced the attack — has its own ripple effect, and, as Shelley et al. (1990) found, it can take years to complete.

Estimating c

We discussed this by e-mail with Barry Wellman. Wellman pointed out that his database of network connections, including e-mail connections, ran to several thousand, not several hundred. Did our model and our research take into account the fact that the distribution of network size was very broad?

This raises a very interesting question: How many people would there be in an average network if everyone had access to an electronic database of all the people they know? In their pioneering work on network size using phone books as their cueing device, Pool and Kochen (1978 [1959]) came up with an estimate of between about 3100 and 4250 for the size of Pool's social network. Freeman and Thompson (1989) replicated Pool and Kochen's work with the phone book method, using a sample of respondents, as have we (Killworth et al. 1990). These results, using the phone book method, vary between about 1700 and about 5500 for total network size.

Our more recent work on the network scale-up model consistently produces, as we said, an estimate of about $c = 290$, $sd = 232$. Obviously, different ways of measuring total networks can produce results that differ by at least an order of magnitude. Note, though, that if t is six billion (the Earth's population), the average network size would be about 6,960—more like the value found using the phone book method.

All measures of network size depend on asking people questions involving recall. Seymour Sudman (1985) made clear that aided recall produced far more data about social networks than does unaided recall. We tested several quite different methods for getting at the total network size (Killworth and Bernard 1978; Bernard, Killworth, and McCarty 1982; Killworth, Bernard, and McCarty 1984; Bernard et al. 1988, 1990; Killworth et al. 1990; McCarty et al. 2001) and it is certainly the case that different measures produce different numbers. In fact, giving a national representative sample of Americans a list of categories to cue them about people in their networks (name your blood relatives, kin by marriage, people you know at work, neighbors, people you know at church, etc.) produces an average network size of 437, $sd = 415$ (McCarty et al. 2001).

Thus, our estimate of 290 for the average network size is a minimum. The number would surely be larger were everyone to have a database of their network handy when we come calling to ask them how many people they know in each of 29 populations. Aware of this, we nonetheless use the figure of 290 because (a) it is very stable, and (b) it produces results (estimates of the size of populations) that are demonstrably correct in many cases, probably correct in others, and incorrect in others. In other words, it's the best estimate we've got at the moment.

From the evidence so far, one way to improve our results (defined as estimating correctly more of the 29 known-size populations) is to improve our estimate of m , the number of people whom each person knows in each of the known-size populations. This, of course, requires basic research on the obstacles to knowing specific things about people in our networks, and this is what we've been doing in recent years.

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P-Systems: A Structural Model for Kinship Studies

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We dedicate this paper to the memory of Oystein Ore

Several mathematical models have been proposed for kinship studies. We propose an alternate structural model designed to be so simple logically and intuitively that it can be understood and used by anyone, with a minimum of complication. It is called a P-system, which is short for parental system. The P-system incorporates the best features of each of the previous models of kinship: a single relation of parentage, graphs embedded within the nodes of other graphs, and segregation of higher level descent and marriage structure from nuclear family structure. The latter is also the key conceptual distinction used by Lévi-Strauss (1969) in the theory of marriage alliance. While a P-system is used to represent a concrete network of kinship and marriage relationships, this network also constitutes a system in the sense that it contains multiple levels where each level is a graph in which each node contains another graph structure. In sum, the connections between the nodes at the outer level in a P-system are especially useful in the analysis of marriage and descent, while at inner level we can describe how individuals are embedded in the kinship structure.

Introduction

Several mathematical models have been proposed for kinship studies. Those that are sufficiently general to allow a network analysis of kinship and marriage or the recording of genealogical data include the genetic graph proposed by the great Norwegian mathematician Oystein Ore (1960), the

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multilevel graph of Harary and Batell (1981), and the p-graph of White and Jorion (1992, 1996), which ultimately derives from the algebraist André Weil (1969). Our present purpose is to propose an alternate structural model, called a P-system, designed to be so simple both logically and intuitively that it can be understood and used by anyone, with a minimum of complication.

Genetic Graphs and Systems with Multiple Levels

The seminal paper of Ore (1960), in which he proposes a model for biological descent, Weil (1969), who proposed an algebra of marriage systems, and Harary and Batell (1981), who embed graphs within graphs as a formulation for systems, are foundational to the mathematical formulation of our model. Some basic definitions are required to introduce their concepts. A *digraph* may have a symmetric pair of arcs, as in D_1 of Figure 1, or none as in D_2 . The *underlying graph* (Harary, 1969) of a digraph D has the same nodes as D , but each arc and each symmetric pair is replaced by an undirected edge, as in G .

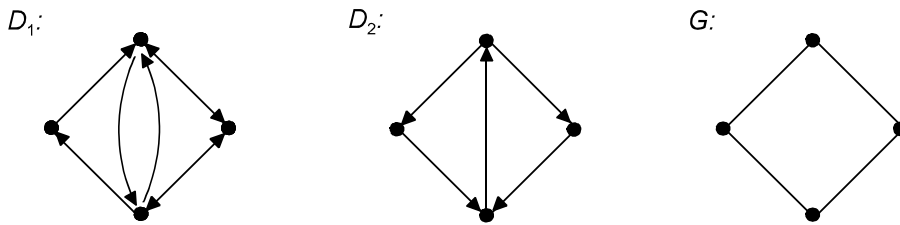


Figure 1. D_1 : a digraph; D_2 : an asymmetric digraph; G : the underlying graph of D_1 and D_2

Ore modelled two parents and one child by a digraph in which each of two nodes, h and w , have an arc to a third node, c . Here, h and w denote husband and wife, and c stands for child. When there are two children, c_1 , and c_2 , there are arcs from h and w to each of them. Figure 2 shows three digraphs D_1 with five nodes, h, w, c_1, c_2, c_3 , a husband and wife with three children; D_2 with nodes for a series of marriages, each couple having one child (c_1, c_2, c_3), where a wife w_1 has two successive husbands h_1 and h_2 and then h_2 has a new wife w_2 ; after which, in D_3 following an appropriate divorce, h_1 and w_2 marry and have a child, c_4 . Being a professional mathematician, Ore had a compulsion to include at least one original theorem in each of his papers. An oriented graph is obtained from a graph G by assigning a direction to each edge of G . His one theorem in the article (1960) is that when one considers the graph G of his genetic oriented digraph, every cycle of G has length divisible by four. Three cycles of length 4 are evident in the graph of D_1 , none in D_2 , and a single cycle of length 8 in D_3 . The only way that a cycle of length 6 could be produced would be if h_1 and h_2 or w_1 and w_2 were to produce a child, which is a biological impossibility.

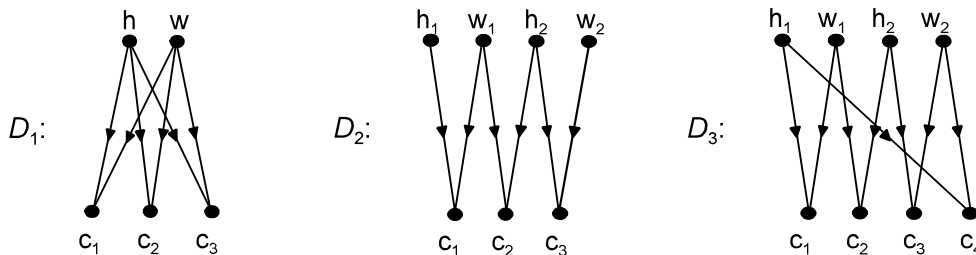


Figure 2. Three digraphs illustrating Ore’s theorem about cycles

We must note that Ore's theorem applies only to idealized assumptions such as when (1) only two generations are involved or (2) we do not consider marriages among persons previously related by descent. When Oedipus marries his mother, for example, the theorem does not apply (Harary 1982).

A limitation of Ore's genetic digraphs, although they can represent empirical networks of descent, is that they do not take marriage into account as distinct from parentage, as does the marriage system formalization of Weil (1969). Weil's algebraic discussions, however, are also based on idealized marriage rules, and do not handle the complexity of empirical kinship networks. What is lacking is some combination of elements of these two approaches that can model both marriage and descent in ways that lead to better intuitive understanding of kinship systems. We also note that Weil's analysis treats idealized types of marriages, while Ore's digraph uses nodes to represent individuals. Two different levels of analysis are thus involved in these two approaches, one using algebra and the other graphs.

If we are interested in combining models for marriage and descent into a more general systems model, Harary and Batell (1981) define a system as sets of relations among elements at different levels where each level is a graph in which each node may contain another graph structure. The embedded graphs approach to systems provides a way to integrate mathematical models of marriage and descent into what we call a P-system.

P-system ²

A P-system is neither a graph nor a digraph, as it may have three types of nodes representing a single female, 0, a single male, 1, or a reproducing couple, 01. It has, however, only one type of arc, as in Ore's genetic digraph. Further, a P-system has two levels of nodes. Each node at level-1 in a P-system contains a graph at level-2. An arc from *u* to *v*, where *u, v* are nodes of either type, represents parentage. At level-1, such an arc entails that *u* is either a parent or a parental couple (e.g., a married couple). If node *u* at level-1 is a married couple, then that node contains a pair of nodes at level-2, the husband and the wife. It will often be the case in a kinship network that node *u* at level-1 is a single child, hence node *v* will contain, at level-2, a node representing a single individual.

In a P-system there are three types of nodes: females (coded 0), males (coded 1), and couples (coded 01 for a female-male pair or 10 for a male-female pair, as convenient to simplify the diagram, or coded $2 = \{0,1\} = \{1,0\}$ if the order of the pair makes no difference). Conventionally, couples will be married. A relation of parentage may exist between any pair of nodes regardless of type, giving sixteen possible combinations of nodes joined by arcs, as shown in Figure 3. We stipulate that each of the edges is oriented here from left to right, giving 16 arcs that go between nodes of the four different types. The coding of nodes and the sixteen possible ordered pairs of nodes connected by arcs are shown for level-1 of any given P-system. Also shown are the level-2 interpretations of the graphs within the nodes at level-1. For example, if an arc goes from a node *u* of type 0 to a node *v*, then node *u* is in a mother relation to node *v*. If *v* is of type 0, then *v* is *u*'s daughter. If node *v* is coded 01, then *v* represents a daughter and her husband, and if *v* is 10, then *v* represents a son and his wife.




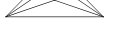
Nodes at Level-2	Arcs at Level-1		Level-1	Nodes at Level-2
Level-2 Parental Legend for Nodes	From Node	→ To Node	Child Legend	Level-2 Offspring Legend for Nodes
mother	0		0	daughter (single)
father	1		1	son (single)
mother and father	01		01	daughter and her husband
father and mother	10		10	son and his wife

Figure 3. The 16 possible parental connections at level-1

² The P- in P-system is short for "parental."

The 16 parental relationships (arcs) in Figure 3 are listed as follows:

0 - 0	mother to daughter
0 - 1	mother to son
0 - 01	mother to married daughter with husband
0 - 10	mother to married son with wife
1 - 1	father to daughter
1 - 1	father to son
1 - 01	father to married daughter with husband
1 - 10	father to married son with wife
01 - 0	mother-and-father to daughter
01 - 1	mother-and-father to son
01 - 01	mother-and-father to married daughter with husband
01 - 10	mother-and-father to married son with wife

The last four are equivalent (transposing mother-and-father) to:

10 - 0	father-and-mother to daughter
10 - 1	father-and-mother to son
10 - 01	father-and-mother to married daughter with husband
10 - 10	father-and-mother to married son with wife

Figure 4 shows a hypothetical example of a network of kinship relations drawn as a P-system. Arcs indicate parentage, and by convention, as indicated by the large downward arrow, all arcs are oriented downward from parents to children. The gender identifications of arcs are shown in the third column of Figure 3. When arcs go to nodes of type 01 or 10, to indicate a child who is married, we use the following conventions in drawing a level-1 graph such as Figure 4.

- 1) An arc *to* a couple *from* the upper left indicates that the left-most individual in that couple is the child, and hence the arc represents an individual of a particular gender. Hence we can see that arcs a and b in Figure 3 are male, while d and g are female.
- 2) Conversely, an arc to a couple from the *upper right* indicates that the rightmost individual in that couple is the child, and hence the arc again represents an individual of a particular gender. Hence we can see that c in Figure 4 is female and h, whose two marriages are indicated by two arcs labelled h, is male (see below).
- 3) Nodes of type 01 or 10 are equivalent in that both indicate a couple, but the significance of the order itself serves to indicate the gender of individuals represented by incoming arcs. If the order is not significant, we may use the equivalent symbol 2 for an unordered pair, $2 = \{0,1\} = \{1,0\}$.

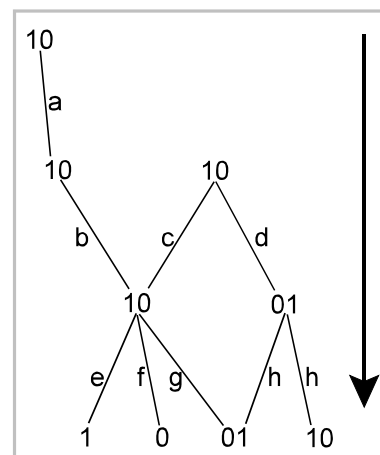


Figure 4. A P-system (edges oriented downward)

Each arc can be identified with the individual who is the son or daughter of the given parent or parents. Individual identities in Figure 4 are labeled by the letters a to h attached to arcs. Arcs that go to nodes of type 0 or 1 indicate single children: daughters and sons, respectively. There is a single arc for such individuals. An arc from mother to daughter, for example, can be identified with the daughter, and there may be multiple daughters descended from the same mother. If an individual is married twice, however, there will be two arcs descended from the same parents bearing labels for that individual and oriented towards the two different marriages, as shown by two arcs bearing the same label h in Figure 4. In general, several arcs for married individuals may bear the same labels.

The P-system incorporates the best features of each of the previous models: a single relation of parentage (Ore 1960), graphs embedded within the nodes of other graphs (Harary and Batell 1981), and segregation of higher level descent and marriage structure from nuclear family structure (White and Jorion 1992), which is also the key conceptual distinction used by Lévi-Strauss (1969) in his theory of marriage alliance. Hence, while a P-system is used to represent a concrete network of kinship and marriage relationships, this network also constitutes a system in the nested sense of Harary and Batell (1981). In sum, the connections between the nodes at level-1 in a P-system are especially useful in the analysis of marriage and descent, while at level-2 we can describe how individuals are embedded in the kinship structure.

If we replace the 0 and 1 labels within the nodes of Figure 4 with the conventional graphical symbols used in anthropological genealogies, viz., the circle and the triangle for females and males, respectively, we can create a conventional genealogical diagram, such as the one shown in Figure 5, which conveys the same information as Figure 4. The system of genealogical notation used in Figure 5 is due to Rivers (1910) and is still in use today by anthropologists. It does not define a proper graph or digraph, however, even allowing (as in a multigraph) for the two kinds of relations, one undirected (=) between spouses and the other directed downward from parents to child. Having two relations would not be a problem except that the parental second (asymmetric) relation goes from the first (symmetric) relation to one of the nodes. In graphs, edges can only go from nodes to nodes, not from edges to nodes, and similarly for digraphs.

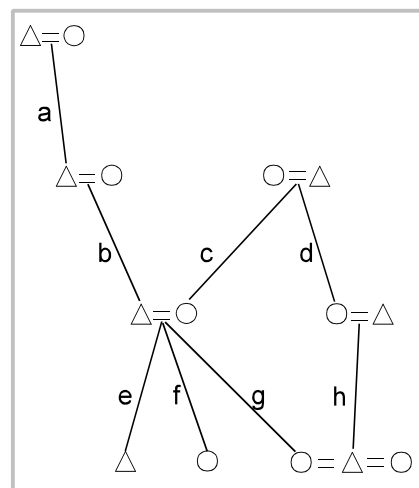


Figure 5. A Rivers-drawing equivalent to Figure 4

By defining a P-system with two levels we are able to specify a structural model of kinship and marriage networks that contains digraphs at each level. At level-1 the relation of parentage is between nodes containing one or two persons, and at level-2 there is either a single node or a generalized “coupling” or marriage relation between individuals of opposite sex. Further, if we include the children descended from any of the nodes at level-1 in the level-2 relationships, as in a genetic digraph, then all nuclear family relationships are segregated at level-2 and all between-family relationships are at level-1. This is extremely useful for visualizing and analyzing the structure of kinship networks in general.

Figure 6 shows the underlying graph of the P-system in Figure 4. Each arc has been replaced by an edge (the direction of individual arcs has been removed). The graph contains a single cycle.

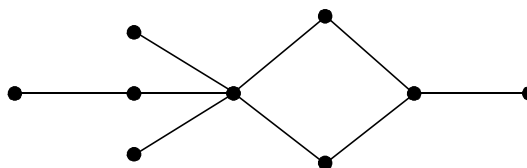


Figure 6. The underlying unicyclic graph of the P-system in Figure 4

Compare Figure 6 with the Rivers-type diagram in Figure 7, which is the basis for Ore’s (1960) genetic digraph in Figure 8. Figure 7 converts the relationships shown in Figures 4 and 5 into a pair of relations, parental and marital, among two types of nodes, black nodes for males and white nodes for females (hence Figure 7 is not strictly a digraph, although in terms of connections it is a “mixed graph” (Harary 1966), having both arcs and edges). The parental relation is defined by arcs between individuals (oriented downward as usual) rather than between a couple and a child. This multiplies

the number of parental arcs. The marital relation between individuals is shown by horizontal (darker) edges. To create a digraph with a single type of arc, Ore suppresses the distinction between male and female nodes and erases marriage bonds. The result is shown in Figure 8.

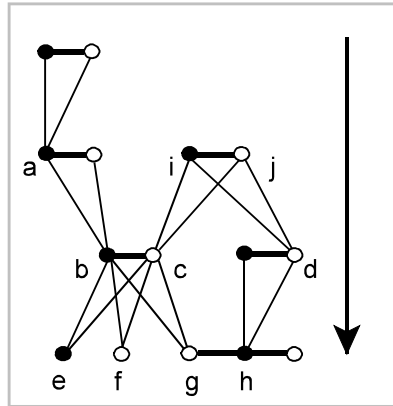


Figure 7: Rivers-type diagram

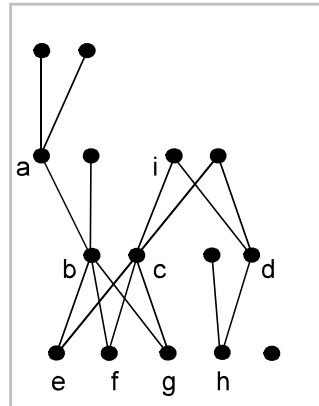


Figure 8: Genetic digraph

Figure 8 loses some of the information in the P-system of Figure 4: information is lost both about gender and marriage. Taking nodes g and h in Figure 8, for example, we know neither their gender nor the fact that they are married. We can restore information about gender through labeling, but analysis of the graph itself, without any gender distinctions, can tell us little about kinship structure. Figure 7, which adds gender and marriage to the genetic digraph, does so at the expense of different types of nodes and relations, a greater number of nodes and arcs and greater complexity of the representation.

The Meaning of Cycles

A *path* in a graph G is a sequence of distinct nodes in which each sequential pair is adjacent in the graph. A *directed path* in a digraph D is a sequence of distinct nodes in which each sequential u, v pair is adjacent, i.e., by arc (u, v) . A *cycle* in G is the union of a $u-v$ path of three or more nodes from u to v and a uv edge. A *directed cycle* in D is the union of a directed path of three or more nodes from u to v and a (v, u) arc. A digraph is *acyclic* if it contains no directed cycles. P-systems derived from biological ancestries are acyclic digraphs (no one is her own ancestor).

If we ignore the direction of their arcs, the cycles in P-systems encode information about marriages within and between families. As an example of marriages within an ancestrally related family, the fact that cousins g and h have married is encoded in Figure 4 in the cycle with edges g-h-d-c-g. In Figure 7, this marriage between cousins is encoded in the cycle defined by nodes g-h-d-i-c-g (and also by cycle g-h-d-j-c-g; other cycles such as g-h-d-j-i-c-g do not imply the specifically consanguineal relation between g and h). In the genetic digraph of Figure 8, this marriage is not encoded at all. Shortly, we will examine and illustrate marriage cycles between families. In the underlying graph of a genetic digraph, cycles occur simply because of the existence of families with two parents and two or more children, such as the cycle e-c-f-b-e in Figure 8. These types of cycles do not occur at level-1, in P-systems.

A P-system is thus a more efficient coding of marriage patterns (reflected in cycles) than the genetic digraph. One might say that we have lost the information in a genetic digraph about cycles in the nuclear family. If we want to recover the relations among individuals as defined in the genetic digraph, however, we can draw at level-2 the appropriate genetic digraph for an individual, couple or nuclear family, as in Figure 9.

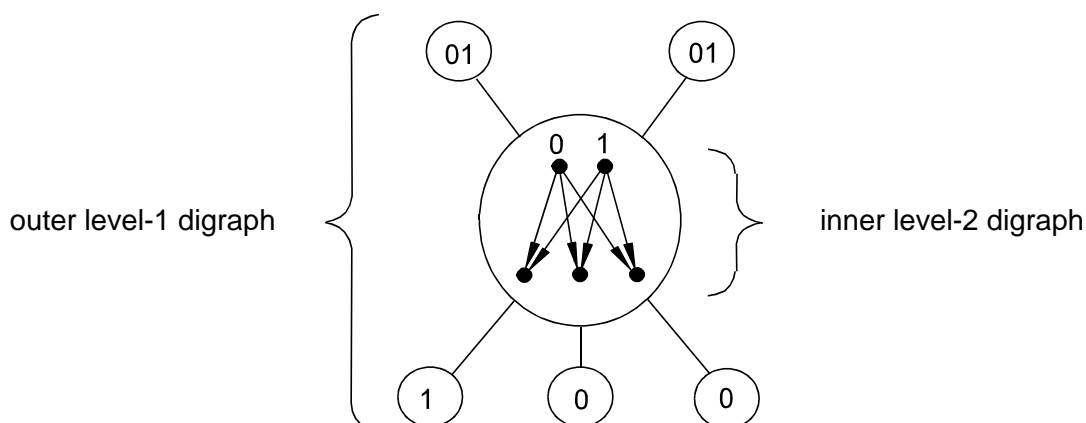


Figure 9. Coding the inner level in a P-system with an appropriate genetic digraph

With this combined representation, we have the following social science observations:

Observation 1: In the graph of a P-system, all cycles at level-1 are due to cycles created by marriages within or between families.

Observation 2: In the graph of a P-system, all cycles at level-2 are due to parental relations between two parents and two or more children within nuclear families, and are always of length 4. This observation instantiates Ore's Theorem in an appropriate context.

Observation 3: If we extract the genetic digraphs of level-2 in a P-system and identify each set of nodes that represent a single individual (in several marriages), then we have a genetic digraph for the entire system. Ore's theorem holds if we do this only for nodes representing two consecutive generations, disallowing Oedipal marriages (Harary 1982).

From P-Systems to P-Digraphs

Two further transformations move us from the P-system as a well defined mathematical structure to the P-graph of recent anthropological literature (White and Jorion 1992, 1996, Jorion 2000).³ First, we introduce a binary coding of the parental relation to indicate the gender of the offspring, and we define an appropriate type of graph to accommodate the binary coding. A *signed graph* (Harary 1953) is obtained from a graph by designating each edge as either positive (+) or negative (-). Figure 10 shows the four signed triangles. The negative edges are drawn dashed. A *signed digraph* (Cartwright and Harary 1956) is defined and drawn similarly.

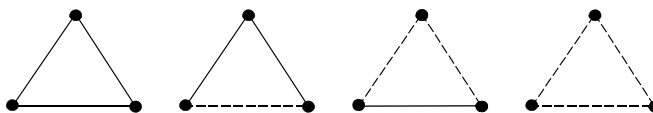


Figure 10. The signed triangles

When the binary transformation to a signed graph is applied to the P-system in Figure 4, for example, we obtain a labeled P-graph as in Figure 11, where the solid arcs (+) are identified with females, and the dashed arcs (-) are identified with males. The assignment of signs by gender is arbitrary and can be reversed without loss of meaning to accommodate different examples. The large downward arrow indicates the direction of the arcs.

³ P- is a mnemonic for parental-graph or a *graphe de parenté*.

Second, since the level-2 coding of nodes into sets $\{0\}$, $\{1\}$ and $\{01|10\}$ can be recovered from the structure of the digraph, we use a single type of node in the P-graph. Thus, we get the unlabeled P-graph of Figure 12, with the usual downward orientation of arcs. With proper instruction one may read types of marriage from patterns of the edges and their signs in cycles of the graph. A feature of Figure 12 is the marriage between cousins, which can be read from the four-node cycle as a marriage of a man with a mother's sister's daughter. All of the structural information in a P-system, such as that in Figure 4, is deducible from a corresponding P-graph, as in Figure 12.

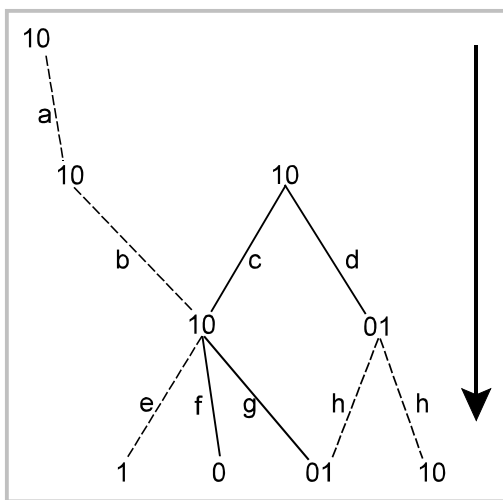


Figure 11: Labeled P-graph of a P-system (downward orientation of arcs)

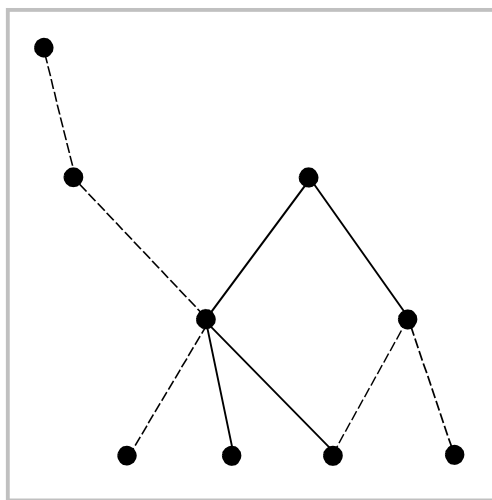


Figure 12: Corresponding unlabeled P-graph (solid lines for females, dotted for males)

Relinking Marriages

Cycles that occur in the level-1 graphs of a P-system may be created by marriage between two persons who are related by common descent. Anthropologists call these *consanguineal* marriages or marriages between blood relatives. The only other way that cycles occur at this level is described by anthropologists as *relinking* among a set of families who "marry in circles." They designate as *relinking marriages* those that create relinking among sets of families.

Different varieties of relinking can be given a series of graph theoretic definitions. A *subdigraph* of a digraph D is a subset of nodes in D together with the arcs between them, as illustrated in Figure 13 for digraphs and their graphs at P-system level-1. A *subgraph* of a digraph D is a subset of nodes in D where edges are substituted for arcs. An *ancestral* node of a subgraph of a digraph D is one that has no indegree in D. A proper or *two-family relinking* in the level-2 graph (or P-graph) of a P-system is a

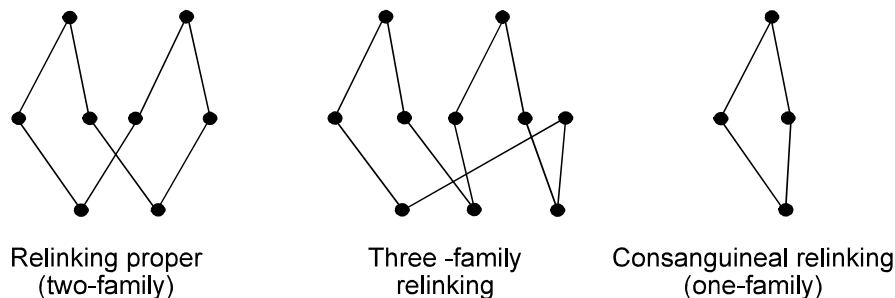


Figure 13. Types of relinking as exemplified in subgraphs of P-systems

cycle that contains two ancestral nodes. One such relinking is exemplified in Figure 13. By extension, a *three-family relinking* is a cycle in the level-1 graph of a P-system that contains three ancestral nodes, and similarly for more than three families. By further extension, a consanguineal marriage is a relinking within a single family, although this is not a properly anthropological term. Figure 13 contains an example of marriage between cousins. The subgraphs in Figure 13 are far from the only examples of each type, since ancestral nodes relate to descendants in many ways and at different generational depths. The illustrations for consanguineal and two-family relinking are at depth 2 (relinkings among cousins), but the illustration for three-family relinking contains a combination of common ancestors at depth 2 (cousin) and depth 1 (sibling).

The P-graph in Figure 14 exemplifies relinking marriages among couples with common ancestors at shallow generational depth. Every node with two incoming arcs represents either a (consanguineal) marriage with a blood relative or one that relinks families in a cycle of marriages. There are many relinkings here between different sets of siblings. Darker lines represent men while lighter lines represent women, opposite to Figures 11 and 12: such adjustments of P-graph representations accommodate the needs of different studies. In this case, taken from the kinship network of a nomadic clan in Turkey studied by Johansen and White (forthcoming, White and Johansen ms.), only descent groups in the male line are recognized (labels on the lines might include codes for the historical generations, migration histories, lineage numbers and first initials of individuals). Sets of nodes with different shadings within the two large circles are two sets of relinked couples. These two sets share one parental node in common that contributes children to each of the relinked subsets, but there is no relinking between the two sets.

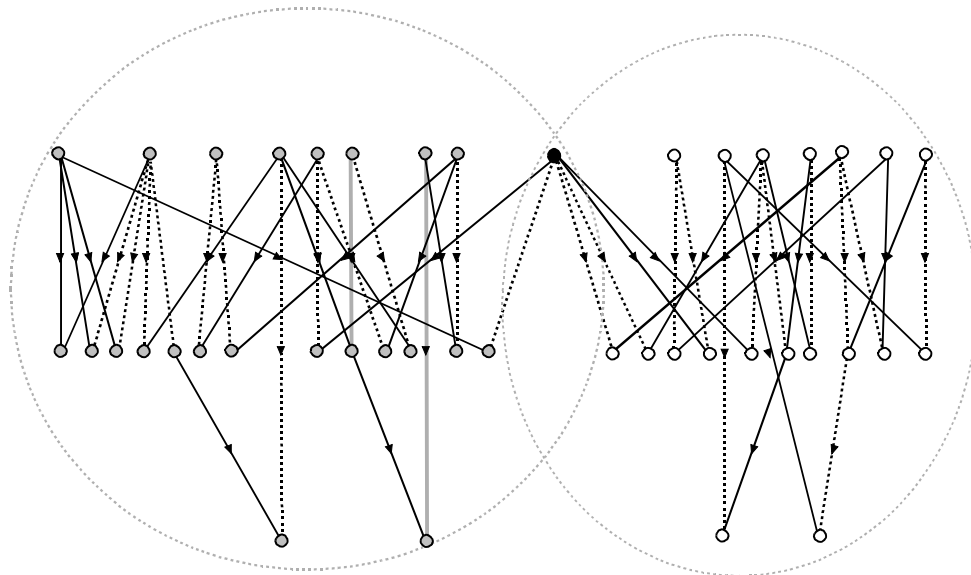


Figure 14. Relinking marriages in a P-graph

Representing Complex Structures

A P-system and its corresponding P-graph, loosely designated, is a simple but sufficiently rich structure to provide a condensed structural representation of a kinship and marriage network, and when its nodes and arcs are fully labelled, it contains all of the information for an underlying P-system. We can identify patterns of intermarriage by studying the kinds of cycles in which marriages are contained. It can be seen from Figure 14, for example, that marriages with parallel cousins in the same patriline are very common. We can also study patterns of marriages between families or lineages. In the study from which this example is taken (White and Johansen ms.), P-graphs are constructed for the entire society and analyzed for changing structural properties in successive time periods.

Mathematical Properties of P-graphs

The *underlying P-digraph* of a P-graph is the digraph produced by treating all arcs as belonging to a single generic type. Figure 15 shows the underlying P-digraph for the P-graph in Figure 12.

The underlying P-digraph of a P-system representing a biological kinship network plus marriage ties has these properties:

1. It is asymmetric and acyclic.
2. The maximum indegree of nodes is 2.

The signed P-digraph (P-graph) of a P-system representing a biological kinship network plus marriage ties has the additional property:

3. For arcs of each sign the maximum indegree of nodes is 1.

Mathematically speaking, then, a P-graph is a signed digraph for which the three axioms above are true. These properties derive from biological kinship. Parentage is not a symmetric relation, and does not permit a directed cycle of ancestry; any given couple or marriage has no more than two sets of parents; biologically, one parent is male and one female. P-graphs having these axioms have been extensively used to represent and analyze the structure of genealogical data collected in field studies (Brudner and White 1997, Houseman and White 1996, 1998a, 1998b, White 1997, White and Jorion 1996, White and Schweizer, 1998). These properties may also provide axioms for culturally defined parentage relations under appropriate circumstances, or they may be modified to take culturally defined parentage relations into account. What has been lacking to date and presented here is a precise mathematical formulation of the underlying type of graph-theoretical structure for kinship: the P-system. The P-graph used in anthropology, more specifically, is level-1 of a P-system in which arcs are given signs appropriate to the gender of individuals at level-2.

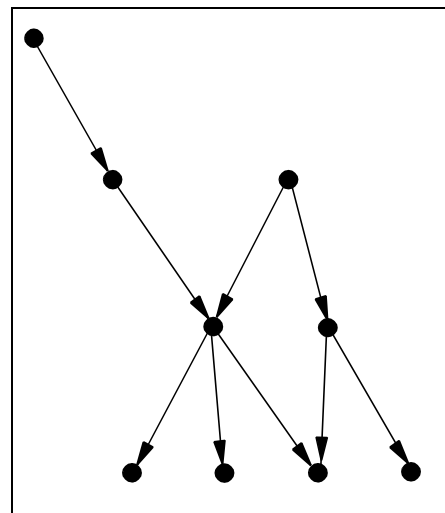


Figure 15. Underlying P-digraph

The P-system captures the details of marriage structure, and can represent the systems of marriage rules studied by Weil (1969), with the benefit of generations situated in time. It captures the parental relationships of the genetic graph for empirical networks, but in a much more parsimonious form that is suitable for the analysis of kinship and marriage structure, or to study changes in structure through time.

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The Minimally Nonplanar Graph of a Mexican Power Network

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Although the Mexican Power Network in 1990 contained just eleven influential politicians, the graph G , in which the edges indicate political alliances, was too complicated to show its structure clearly because it had 23 crossings of pairs of edges. In an attempt to simplify G , we found a drawing with only one crossing. We present a mathematical proof that G can not be simplified further.

Introduction

In order to analyze the structure of the Mexican Power Network, Gil-Mendieta, Schmidt, Castro and Ruiz (1997) displayed a sequence of graphs showing the evolution of the network kernel. The whole political network contains 5400 actors, and has an extremely complicated structure. The kernel contains only 39 powerful politicians (**Figure 1**) selected by following an historical criterion and the description of former presidents and other influential politicians. They showed the dynamics of the centrality in the kernel, i.e. its shifting over time since some actors disappeared (died) while others entered it. Using decade-long intervals, the changes in this network from 1920 to 1990 were shown.

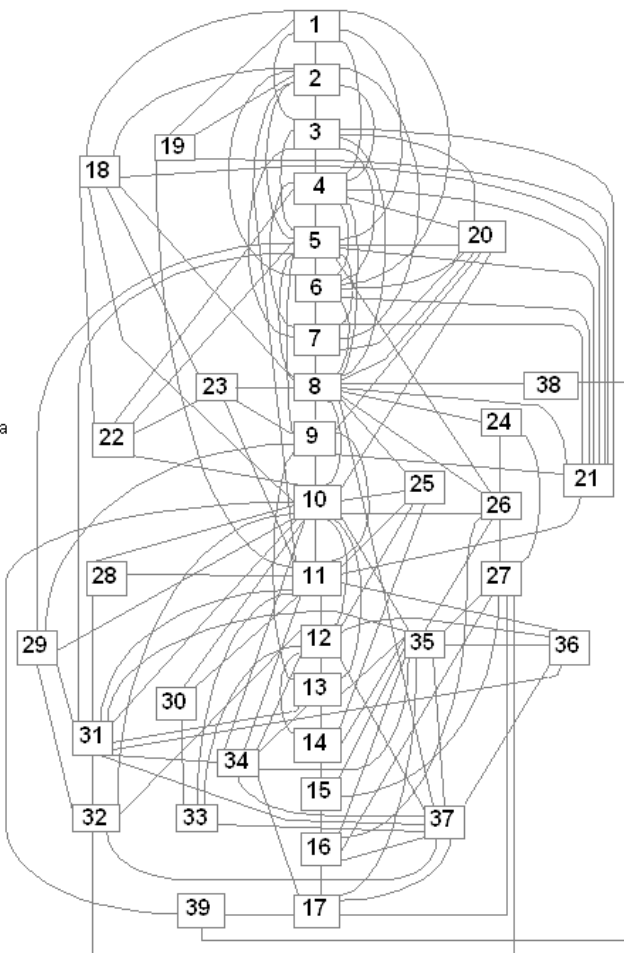
The Mexican Power Network in 1990 contained just eleven influential politicians. They are represented by the nodes of the graph G of Figure 2, in which the edges indicate political alliances. The original drawing (part of Figure 1) was too complicated to show its structure clearly because it had 23 crossings

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1. Madero, Francisco
2. Carranza, Venustiano
3. Obregón, Alvaro
4. Calles, Plutarco E.
5. Portes Gil, Emilio
6. Ortiz Rubio, Pascual
7. Rodríguez, Abelardo L.
8. Cárdenas, Lázaro
9. Avila Camacho, Manuel
10. Alemán Valdés, Miguel
11. Ruiz Cortines, Adolfo
12. López Mateos, Adolfo
13. Díaz Ordaz, Gustavo
14. Echeverría Alvarez, Luis
15. López Portillo, José
16. Madrid Hurtado, Miguel De la
17. Salinas de Gortari, Carlos
18. Aguilar, Cándido
19. Treviño, Jacinto B.
20. Gómez, Marte R.
21. Santos, Gonzalo N.
22. Alemán González, Miguel
23. Jara, Heriberto
24. Beteta, Ignacio
25. Sánchez Taboada, Rodolfo
26. Beteta, Ramón
27. Beteta, Mario Ramón
28. Carvajal, Angel
29. Serra Rojas, Andrés
30. Ruiz Galindo, Antonio
31. Carrillo Flores, Antonio
32. Bustamante, Eduardo
33. Loyo, Gilberto
34. Ortiz Mena, Antonio
35. Margáin, Hugo B.
36. González Blanco, Salomón
37. Salinas Lozano, Raúl
38. Cárdenas Cuauhtémoc
39. Alemán Velasco, Miguel



of pairs of edges. In an attempt to simplify G , we finally found a drawing with only one crossing. We present a mathematical proof that G can not be simplified further. Graph theoretic concepts not presented here can be found in Harary (1969).

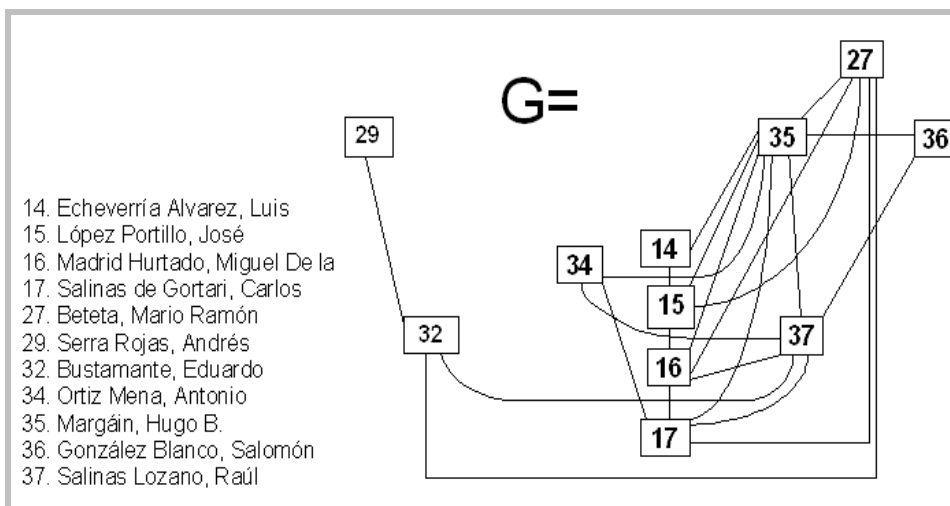


Figure 2. The Mexican Network of Power (1990) with 11 actors.

Redrawing the graph

Gil-Mendieta and Schmidt (1996), in an analysis of the creation and evolution of the Mexican Power Network (MPN), showed the changes in the center of the network by analyzing and measuring the shift in centrality when new actors arrived and others left. Their Figure 1 shows the MPN graph with a very complex web of edges describing different connections among the 39 actors during 1922-1990.

The analysis was based on decade-long intervals, which included more than one presidential administration (six years). Thus it was possible to overcome limitations which could assign high values to the president due to his hierarchical position. Then they measured the centrality values of actors with extended influence (beyond the limits of one administration), using the formula (1) to calculate the value of the node index power or node centrality.

The *diameter* $d(G)$ of a connected graph G is the maximum length of a geodesic (Harary 1969, p. 14).

The *node index power* of node v (Gil et al. 1997) is written A *subdivision of an edge* uv of G is obtained by inserting into this edge some new nodes of degree 2. A *subdivision of a graph* G (Figure 6) is the result of subdividing its edges. Further, G is also considered as a subdivision of itself. Let n be the total number of nodes in the G and $n(v,k)$ the number of nodes at distance k from v . Here $1/k$ is the influence distance factor.

$$I(v) = \left[\sum_{k=1}^{d(G)} n(v,k)/k \right] / (n-1) \tag{1}$$

The only node at distance zero from v is v itself. As G is connected, every node $u \neq v$ has a distance from v between 1 and $d(G)$, proving equation (2).

$$n = \sum_{k=0}^{d(G)} n(v,k) \tag{2}$$

For simplicity we relabelled the nodes of G in Figure 2 and redrew it many times with fewer edge crossings each time, finally obtaining the graph H of Figure 3 with the minimum possible number, one, of crossings. This visual simplification enables both a clearer and more rapid understanding of the structure of this network and its centrality.

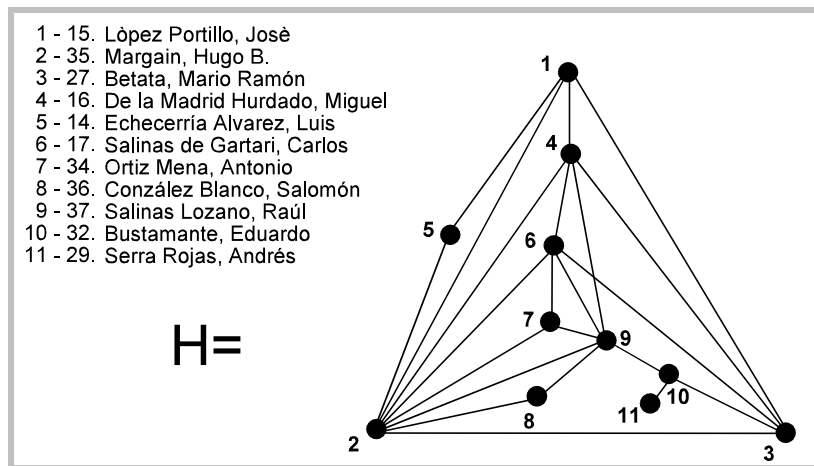


Figure 3. This relabeled graph with nodes marked 1 to 11, is isomorphic to Figure 2, drawn with just one crossing, namely edges 36 and 49. It is not planar and so is minimally nonplanar.

From Equation (1) we calculate the centrality of each node, in the political case we named it *node index power* and defines the extended influence power of each actor. For the graph of Figure 3, we get:

Table 1. $n(v,k)$ and $I(v)$ values.

	$n(v,k)$				$I(v)$
	$k=4$	$k=3$	$k=2$	$k=1$	
V_1	0	1	5	4	0.6833
V_2	0	1	1	8	0.8833
V_3	0	0	5	5	0.7500
V_4	0	1	4	5	0.7333
V_5	1	1	6	2	0.5583
V_6	0	1	4	5	0.7333
V_7	0	1	6	3	0.6333
V_8	0	1	7	2	0.5833
V_9	0	0	4	6	0.8000
V_{10}	0	1	6	3	0.6333
V_{11}	1	6	2	1	0.4250

Table 1 list both the degrees of the 11 nodes of Figure 3 under the column $k=1$ and the $I(v)$ values in the last column. The non-increasing degree sequence of G is (8, 6, 5, 5, 4, 3, 3, 2, 2, 1) for nodes 2, 9, 3, 4, 6, 1, 7, 10, 8, 5, 11 respectively. This is exactly the same sequence of nodes for the non-increasing sequence of values of the $I(v)$. Hence we see empirically that the degree sequence can be used as a close approximation to the power index the $I(v)$ sequence.

A *planar graph* (Harary 1969, p. 102) can be drawn in the plane without any crossings. A nonplanar graph must have at least one crossing.

A drawing of a planar graph in the plane without crossings results in a *plane graph*. The *crossing number* $X(G)$ of a graph (Harary 1969, p.122) is the smallest possible number of crossings in a drawing of G in the plane. Thus $X(G) = 0$ if and only if G is planar. A graph G is called *minimally nonplanar* (Harary 1965) if its crossing number $X(G)$ is 1.

We now develop the statement of the classical theorem that provides a criterion for a graph to be planar. Several definitions are required.

A node v and an edge e of a graph are *incident* when e joins v with some other node u , so that $e = uv$.

The *degree* of v is the number of edges incident with v , i.e. the number of nodes adjacent to v , see Figure 4.

The *removal of an edge e* from a graph F results in the subgraph $F - e$ that contains all the nodes of F and every edge except e (Harary 1969, p. 11).

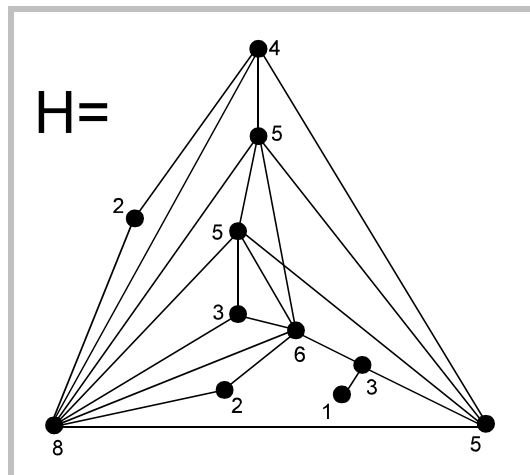


Figure 4. Degrees of the nodes of Figure 3.

To illustrate, Figure 5 shows that the two best known nonplanar graphs; the complete graph K_5 and the complete bipartite graph $K_{3,3}$ are minimally nonplanar.

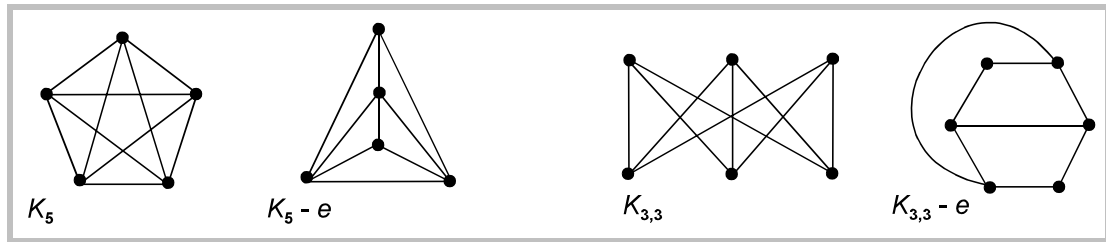


Figure 5. Two nonplanar graphs K_5 and $K_{3,3}$ and the planar subgraphs obtained by removing one edge from each.

A subdivision of an edge uv of G is obtained by inserting into this edge some new nodes of degree 2. A subdivision of a graph G (Figure 6) is the result of subdividing its edges. Further, G is also considered as a subdivision of itself.

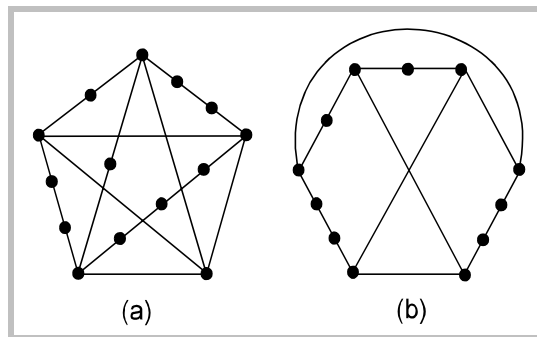


Figure 6. A subdivision (a) of K_5 and (b) of $K_{3,3}$

Kuratowski's Theorem (see Harary 1969, p. 108). A graph G is planar if and only if G contains no subgraph which is a subdivision of K_5 or of $K_{3,3}$.

With the help of this powerful criterion for the planarity of a graph, we are now ready to prove our result.

Theorem. The graph G of Figure 2 is minimally nonplanar.

Proof. Figure 7, which is a subdivision of $K_{3,3}$, is a subgraph of Figure 3.

Therefore Figure 3 is nonplanar by Kuratowski's Theorem. But graphs H of Figure 3 and G of Figure 2 are isomorphic and H has only one crossing. Thus G is minimally nonplanar.

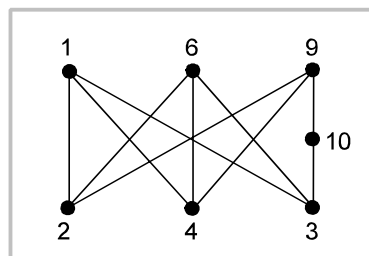


Figure 7. A subgraph of G in Figure 3. It is a subdivision of $K_{3,3}$.

The political analysis implications

Redrawing the graph loses the chronological order, which is important because political actors have historical presence. However, the relative chronological order can be represented by a **digraph**, where the arrows show which actor has precedence and bi-directional arrows show that the two actors are contemporary (**Figure 8**). This doesn't solve the issue of the actor's hierarchical position, which also can be shown by arrows of a different type.

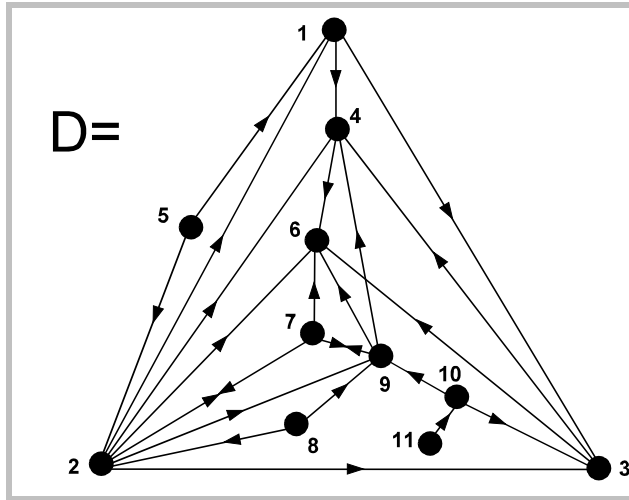


Figure 8. A digraph whose graph is G .

An actor with the maximum degree will have more influence than those with lesser degree since he has as many direct contacts as possible. In the given network, the actors with maximum degree are #2 with degree 8 and #9 with degree 6 (**Figure 4**). A higher hierarchical position means formal disposition of political resources (Dahl 1963) which combined with seniority can produce the relative political relevance of a political actor.

The *degree sequence* of a graph is a list of all the degrees from the largest to the smallest. For H in Figure 4, this sequence is (8,6,5,5,5,4,3,3,2,2,1). The unique actor in Figure 3 with most direct connections is #2.

Conclusion

Redrawing the nonplanar graph to display it with fewer crossings enables clearer understanding of its structure. The simplification has visual intuitive and explanatory advantages, even though it produced a (minimally) nonplanar graph.

However, from the political analysis perspective, redrawing the graph could lose the chronological - perspective and also the power relation because of the change in time. In particular in Figure 8, nodes 1,4,5 and 6 were presidents. Therefore the direction of influence depends on the year of the analysis.

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The Urban Communes Data Set: a Gold Mine for Secondary Analysis

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INTRODUCTION

It seems a commonplace among social network researchers to assert that there are too many methods chasing too few data; perhaps accordingly, there has been a tradition of the systematic re-analysis of existing data. For one, classic data sets (the Sampson monastery data, the bank wiring room data, the Southern women) have been used to adjudicate between methods for the induction of structure (given other data such as subsequent leaving of the group in the Sampson case). But re-analysis has been an important theoretical, as well as methodological, tool: the Davis-Leinhardt (Davis 1979) collection of data sets was used to determine the tendencies of choice processes in informal social groups using the Holland-Leinhardt U|MAN triadic analysis (Holland and Leinhardt 1970; Holland and Leinhardt 1971; Holland and Leinhardt 1975), leading to sets of model with increasingly complex but interpretable principles of internal organization (e.g. Johnsen 1985). This pooled data set led to Davis and Leinhardt's (1972: 222f) rejection of Homans's (1951: 182ff) argument that influence would be intransitive when possible.

Of course, the theoretical conclusions drawn will depend upon the type of relation studied (perhaps Davis and Leinhardt would have indeed found intransitive influence if the relations they studied were relations of influence, as opposed to "liking") and the type of group. Children's play groups seem to have different organizational principles from adult task-oriented groups, and there are almost certainly shades of difference in between. For these reasons, there is a great need for further banks of data sets that can be used to test basic hypotheses about social networks, data sets which include multiple items and multiple groups. Thanks to the support of the National Science Foundation, we are able to make public what is probably the largest set of comparable network data on a wide variety of naturally occurring and non-task oriented adult groups in the world, the Urban Communes Data Set (UCDS) from 1974. Derived from a stratified national sampling frame, with research conducted in six cities, 60 different intentional communities were studied (and, as discussed below, are currently being studied), producing a dramatic wealth of network data. (Five groups declined to permit network data to be gathered during the first wave, although they relented in later waves.)

In addition to being naturally occurring *gemeinschaftliche* groups, these were relatively closed circles: the great majority of significant nonkinship relationships of our respondents were with fellow commune members. Consequently, these data are likely to be quite useful in examining social-psychological

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processes that may compare self-perception, esteem, and attitudes to group position, as well as other structural aspects of social networks. We go on briefly to describe the data set, the network data, and then how it may be obtained. Further information is available from our website, discussed below, and in Zablocki (1980).

THE DATA SET

Sampling

A commune was defined as a household in which five or more largely unrelated adults (either with children or of both sexes) voluntarily decided to live together with a collective identity so as to reach some ideological goal having to do with the achievement of community. In cases in which data collection began on a group that was later disqualified from analysis, we have retained that data for secondary analysts. Thus we have extensive network data on one group later determined to be basically involuntary (a rehabilitational commune in which entrance was a court-prescribed alternative to jail time).

To maximize geographical diversity, six large Standard Metropolitan Sampling Areas from different regions across the United States were chosen for analysis. Fieldworkers in each city first compiled a comprehensive census of communes within the SMSA. Communes were then selected on the basis of certain key variables such as ideological type, population size, number of children, type of neighborhood, and year founded. In the rare instances where access was flatly denied by a selected commune, the next highest group on the priority list was chosen for study.

There was, however, one significant deviation from this quota-based selection procedure. Early in the fieldwork, researchers located a number of nationwide "new religious movements", organized in the form of federations of communal households (whose members often moved among households in different states). Because of the obvious sociological and historical importance of these new religious federations, one NRM was selected for study. Representative households belonging to this NRM were included in the sample from each of the six cities. A group-level variable ("GURULAND") indicates whether a commune was part of this federation or not.

Waves

The data collection occurred in three large periods, separated by intervals of around 12 years. Within the first of these periods, the first wave of data collection, which we are currently making public, was conducted in 1974. A second wave took place in 1975 of groups that were still in existence. A smaller wave took place in 1976, only collecting certain data among a minority of the remaining groups. At these times, new members were incorporated into the sampling frame. In the second period, 1984-1987, two waves of data (the first a limited pilot study) were collected on these same respondents, although the vast majority were no longer in communal groups. These focused on the consequences of unconventional behaviors and the possible changes in value orientations as persons left the "sacred canopy" of the group. In the most recent period, a pilot study has been completed and an additional wave of data from former members is currently being collected; this focuses on the relationship between the retention of network ties and the continued commitment to the beliefs, values, and behaviors associated with group life. This most recent wave of data will be made public as soon as it is all collected and cleaned. We hope that there will be sufficient interest in the longitudinal aspects of the data set to warrant cleaning and making public the intermediate waves, though they lack the closed network aspect of the earliest waves.

Data

The UCDS itself is a multiwave, multimethod study. While questionnaire techniques predominated, close to 1,500 hours of person-to-person, open-ended interviews were recorded on tape and on interview schedules, and these formed an indispensable part of the data library, although these are not being made public because of the difficulty of preserving anonymity of the respondents.

At the group level, fieldworkers in cooperation with members of the communes themselves were asked to complete fifty-four closed-ended items (such as dates of founding, type of authority, principles of decision making, economic organization, method of child rearing, type and intensity of ideology, and marital and sexual arrangements).

At the individual level, four or five members of each commune participated in a long interview (from two to four hours) covering each's early life, current life, present goals, and participation in the ongoing activities of the commune. This schedule is a combination of open- and closed-ended items. Other members were given a shorter version containing twenty of the most important closed-ended questions from the longer version. The short form comprises the minimal data set desired for each commune member. All members were also given an attitude questionnaire consisting of ninety-nine Likert-type items drawn, for the most part, from standard scales used on national surveys for the assessment of alienation, preference, self-esteem and self-perception. The most important aspects of the individual level data are made public in a single data file. A special survey of 32% of members who left in the first year of data collection was also conducted. Finally, and most importantly for our purposes, is the network data, which we go on to describe in greater detail, after some remarks about the probable degree of validity of these data.

Validity

The face validity of the data collected is high primarily because of the positive dispositions of almost all of the respondents toward the research project and because the first two waves were collected not by questionnaire but through face-to-face interviews. This validity has been demonstrated in two ways: (1) high consistency in reporting factual background information at widely separated time periods; and (2) high consistency, in the first wave, between interview data and data gathered through participant-observation.

The extent of cooperation and the apparent quality of the data collected were, on the whole, quite high. All the communes participated in the gathering of the systematic commune-level information. At the individual level there was a more selective but still quite high rate of response. For the first wave, we received personal background data from 81 percent of the possible urban respondents (N = 667), more than half of whom participated in autobiographical interviews. Attitude data were collected from 60 percent of the sample, as these questions were less interesting to many of the participants than questions focusing on their own lives, the group, or their relations with other members.

Relationship data were obtained from 70 percent (80% if we exclude the groups which refused on principle to allow for the distribution of these questionnaires). Ethnographic and interview cross-checks revealed a uniformly high quality to the responses, as the questions were generally judged to be relevant by the commune members and hence answered with care. Finally, the network data has been coded three times by independent coders to eliminate errors. As a consequence, we believe the overall quality of the resulting data to be very high.

THE NETWORK DATA

Network data were collected by a special instrument that had two parts. In the first, respondents were asked to volunteer the names of persons that they thought had particular characteristics. Characteristics asked include "supportive," "decisive," "influential," "loving," "interested in fixing up the house," "interested in kids," "strong," "sexy," "dominant," "charismatic," "intuitive," "holy," "passive," "dependent," and "narcissistic." Cases in which the respondent indicated that "everyone" possessed some characteristic were coded differently from cases in which the respondent chose specific alters. Respondents were also asked to report who cleaned the bathroom, cleaned the kitchen, did the laundry, went shopping, put a child to bed, called a meeting together, confronted someone at a meeting, made a statement of policy to the group, dealt with outside authorities, or mentioned that the house was messy.

Second, the respondent was asked to fill out a page-long relationship census for each other person in the group. First the respondent was asked to describe her relationship with the person in question in her own words; then a number of closed choice questions followed. The respondent (ego) was asked to judge how much time the two spent together ("just by yourselves"), to report whether or not she knew alter's father's job (informal discussions with a number of social psychologists indicated that this was a good way of identifying people who had spent some time talking with each other about themselves), which of the two had more power in the relationship, and whether alter ever acted like a mother, father, sister, brother, son or daughter in their relationship (multiple choices were allowed and coded).

Then, each respondent was asked to describe the tenor of her relationship with alter by answering whether each of a set of descriptions of the relationship was true, false, or sometimes true: these were "work together," "mind children together," "sleep together," "loving," "hateful," "parental," "exciting," "awkward," "tense," "jealous," "unreciprocated in some way," "exploitative," "improving," "sexual," to indicate whether the relation was more important to the respondent than to alter, or whether (a separate item) the relation was more important to alter than to the respondent. Finally, the respondent was asked to indicate five significant persons in her life, who could be outside the commune. If any commune member was listed, this was noted in the data through an indicator variable.

The possibility for detailed analysis of multiplex relations is obvious given the many relational items asked; even more exciting is the possibility of embedding such analysis in contextual comparisons given the group-level data, or tying network position or effects to individual level variables.

GETTING THE DATA

The respondents were promised confidentiality and that their responses would only be used for purposes of social scientific research. Accordingly, we are taking the strictest precautions to ensure that anonymity is preserved. This means that much of the contextual data that could conceivably be used to identify groups cannot be made public; we also are restricting access to those with a departmental affiliation who can present a clear research and/or educational objective. We also ask that researchers reciprocate by making public any measures or indices that prove helpful, and supplying programs when possible to replicate analyses.

To learn more about the data, you may go to our web-site.² You can also follow links from the Rutgers sociology department (sociology.rutgers.edu); it is listed under "Links to Other Sites" under "Rutgers Sites of Special Interest." From our home page you may learn more about the data set. If you want to download the data, send an e-mail message to us (follow the "contact us" link) explaining your project, and we will return a user-name and a password with which you can reach the password-protected data page.

Analysis of pooled dyadic data from separate networks poses a problem for conventional network software; accordingly, a user-friendly program for Dyadic Analyses of Multiple Networks, previously described in these pages (Martin 1999) is also on the web-site. This program will allow the user not only to analyze the data using QAP models, but create files for UCINET and KRACKPLOT analysis. We believe that the Urban Commune Data Set will provide network researchers with a vast array of opportunities for comparative network research, as one can make structural analyses that compare different groups, the same groups across time, or different relations within the same groups. This may give us a better understanding of the ways in which network properties, frequently assumed to be universal, may depend on group properties hitherto unexplored.

² <http://sociology.rutgers.edu/UCDS/UCDS.htm>

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Social Network Measures of Parent-Child Exchange: The Applications in Taiwan and the Philippines

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This study draws on social network measures to describe complex flows of resources between older parents and their adult children. Using data from the 1989 Taiwan Survey of Health and Living Status of the Elderly and the 1996 Philippine Elderly Survey, we find that more than 80 percent of older Taiwanese and more than 97 percent of Filipino elderly are actively engaged in transfers with their children, yet few older persons are engaged in all of the possible transfer activity with children. Redistributive transfer patterns, where older parents receive resources from one or more children and then give resources to another child, characterize about 10 percent of older parent networks in Taiwan and 64 percent in the Philippines. In the majority of these cases, the older parents are involved in more than one redistributive flow with children. Most of these redistributive flows take place across household boundaries rather than exclusively within or outside of the household.

INTRODUCTION

The Intergenerational transfers in families play an important role in the social, economic, and physical well-being of older persons throughout the world. Both the resources families provide and the obligations they demand can affect such behavior as the timing and quality of retirement, migration patterns, and the use of formal health care services. Family transfers are especially important in many non-Western societies due to the lack of strong or pervasive public support systems such as social security or other old-age pensions (Kinsella and Gist, 1995) and where children and other family members are more geographically proximate (Glaser and Tomassini, 2000). Under such circumstances, broad social networks that encompass extended family, friends and neighbors may be more common. Moreover, in less-developed economies, transfers from family members provide resources for investment or to buffer against short-term economic problems in the absence of market-based alternatives such as formal credit or insurance markets.

In this paper we examine transfers of resources between parents and their adult children from the perspective of social network analysis, an approach that adds to the current body of knowledge on family exchange in two ways. First, data on intergenerational transfers are often difficult to present and interpret. Transfers involve multiple actors, multiple currencies and multiple directions. Tables that attempt to capture two or more of these dimensions are usually too cumbersome to portray clear or understandable patterns. Social network measures are able to capture multiple transfers among multiple actors (Uehara, 1990). Network measures also can be used to describe resource flows in terms of the types of goods and services transferred and to reflect the direction of resource flows, thus allowing for a more detailed, yet parsimonious, empirical description of the nature of activity within a social exchange network.

A second benefit of using a network approach is that it strengthens a currently weak empirical knowledge base of *how* the extended family functions in non-Western countries. A number of anthropological and in-depth community studies describe resource exchanges within the extended family (e.g., Cain, 1991; Peterson, 1993), but few nationally representative studies exist on exchange behavior among multiple family members.

The goal of this paper is to develop a set of parsimonious measures that summarize activity in familial exchange networks and that will be useful for comparative studies across populations with different family structures. We address the following research questions: 1) What is the level of transfer activity between older parents and their children?; 2) To what extent are older persons involved in concurrent exchanges with two or more of their children?; and 3) How many types of resources are being transferred between parents and children? We also examine how these network measures are related to each other (for example, are more active kin networks also more diverse in the resources transferred?). Lastly, we examine the relationship between the composition of the network and intergenerational transfer patterns.

DYADIC APPROACHES TO STUDYING INTERGENERATIONAL TRANSFERS

Most sociological and economic studies of intergenerational transfers focus on parent-child dyads rather than examining exchanges with children as part of a network of resource transfers. While questions about transfers between two people yield some insight, they provide a limited picture of the intergenerational transfer activity taking place across the family as a whole. A dyadic perspective simply does not provide the conceptual tools for formulating hypotheses about the strength or intensity of the family exchange network. Research on family transfers needs to account for the fact that the kin network is not solely the sum of its dyadic ties but instead embodies complex pathways of resource transfers among family members.

Interest is beginning to grow among researchers about how aspects of larger kin networks affect dyadic transfers. One comparative study of intergenerational coresidence and contact in Japan and the United States incorporates kin network information such as the count of the number of children, siblings, parents and parents-in-law (Rindfuss and Raley, 1998). Economic models of transfers in the United States have examined the effect of the total number and relative financial well-being among children on bequests and inter-vivos transfers (see Tomes, 1981 for an early review). Other studies in the United States have assessed the effects of shared family characteristics on transfers between parents and specific children, utilizing fixed effects models to control for unobserved family characteristics (Henretta et al., 1997; McGarry and Schoeni, 1997; Wong et al., 1995). This body of research extends our understanding of intergenerational exchange in important ways by examining the influence of characteristics of the members of the family network on transfers in a specific dyad. However, the research literature still tends to neglect an important aspect of intergenerational exchanges: that transactions between two individuals in a family network are not independent of the transactions (or lack thereof) among all other dyads in that network (Walker, Wasserman and Wellman, 1993).

Social Network Approaches

A social network approach differs from a dyadic approach, even one that considers network structure, because emphasis is placed both on *network structure* and on the *flow of resources* through this structure. Wellman (1996), among others, has shown the importance of going beyond establishing the ties that define the structure of the social network to an examination of the activity within that network. We would expect that many of the conclusions from prior research about intergenerational transfers would take on different meanings with this shift in focus.

Social network approaches have been most extensively used to study social support for the elderly. These studies focus mainly on identifying the composition of the active social networks (those persons providing support *to* the older person) and the extent to which the type of support provided (e.g., affective or instrumental) varies by network composition (Litwin, 1996). Measures used include the size of the support network and the average, heterogeneity, and range of characteristics of the members of the support network (Marsden, 1990). A recent review of longitudinal studies of the support networks of older people in Europe showed tradeoffs over time between family members and friends in the composition of the support network, with the most consistent support coming from family members, especially adult children (Wenger, 1997).

Results from the Canadian East York studies, involving an intensive community network survey and qualitative interviews, highlight why certain types of ties are more supportive than others (Wellman and Wortley, 1990). The authors found that parent-child ties were positively associated with at least three dimensions of support, but that neither personal characteristics nor similarities among network members were associated with the provision of any particular kind of support (Wellman and Wortley, 1990: 581). Other network studies of social support have examined variation in the size of support networks, their density, composition, and the degree of reciprocity (Litwin, 1996; van Tilburg, van Groenou and Thomese, 1995; see Walker, Wasserman and Wellman, 1993 for a review). The multiplexity of these supportive relationships, defined as the number of supportive services provided, also has been found to be positively associated with the well-being and health of older persons (Mugford and Kendig, 1986; Uehara, 1990). A common analytical approach in these studies is to develop typologies of support networks and link them to health or social outcomes (Litwin, 1996; Mugford and Kendig, 1986; Sarason et al., 1983; van Tilburg, van Groenou and Thomese, 1995; Uehara, 1990).

Two observations can be made from this brief review of network studies of family transfers. First, much of this research has been conducted in Western societies; namely, North America, Western Europe and Australia. Second, many of these studies rely upon identifying the active links (those already engaged in transfer activity) to define the boundaries of the social network. This approach requires a respondent to “nominate” all of the persons with whom they have supportive contacts. However, just as a focus on dyadic transfers neglects the interdependency among pairs in the network, “treating the set of supportive ties as an entirely separate and enclosed system makes the assumption that they operate independently of all other relationships in the network” (Walker, Wasserman and Wellman, 1993). Who is not engaged in transfer activity is just as important as who is.

The present study attempts to fill in the gaps described above by applying social network measures of family exchanges in a non-Western setting and to examine intergenerational transfers in the context of the kin network. In the case of kin networks, the family structure itself defines the size and shape of the social network. By taking advantage of the relationship between the potential connections in the kin network and the actual resource flows observed among family members, we can calculate several indices that measure the degree of activate exchanges within the underlying kin structure.

The strength of a network approach to the study of intergenerational transfers is that it enables one to examine multiple resource flows and, from a more theoretical standpoint, connect exchange behaviors to the social structures in which they occur (Uehara 1990). Most studies of support and exchange have been conducted using ego-centric data which rely on respondents' perceptions of who is in the network

and restrict the network boundary to those actively involved in exchange behavior. Complete network analysis uses data collected from the entire social system in an attempt to understand how the various components of the system are interrelated. In this study we use data on the extended family--the kin network--to construct indices of exchange behavior from individual self-reports. Consequently, we can take advantage of the power of complete network analysis since we have a bounded social system and at the same time make inferences to populations based on sampling theory since the data are a nationally-representative probability sample. Thus, the network measures developed here are not simply capturing the sum of all dyads, but enable one to study facets of an interdependent system of connections and resource flows and use these measures as population-level indicators.

Conceptual Framework for Analysis of Kin Networks and Exchanges

Figure 1 depicts a sample ego-centric kin network with both potential and activated ties between adult children and the older parent (ego) shown. Ego is placed in the center in a banded circle, with spouse attached through a marriage sign (=). Children are represented by individual squares with triangles for spouses where present. Resource transfers are shown as solid arrows while inactive ties are shown as dotted arrows. Potential flows in each direction exist for each parent-child dyad. The measures described below provide summaries of the patterns of transfer activity taking place concurrently in a family such as the one depicted here. While the focus of the present analysis is on the complex transfers between parents and their children, other analyses may expand to include transfer patterns across multiple generations in the family, extending vertically to include grandparents and grandchildren, and horizontally to include siblings and cousins.

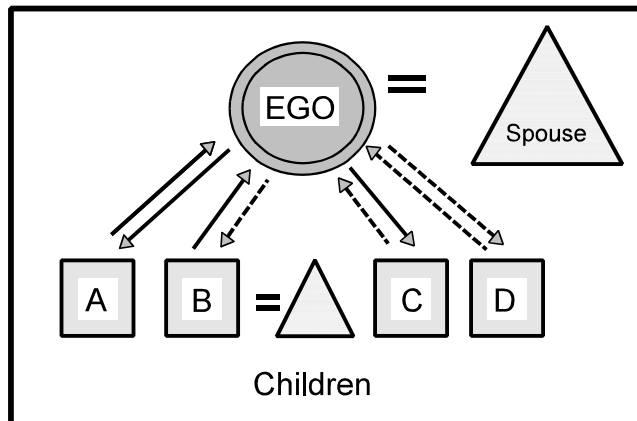


Figure 1. Schematic of Kin Structure, Active, and Potential Exchanges

In this study we are particularly interested in two-step pathways with ego (the older parent) at the center. These pathways can be seen as concurrent exchanges that potentially redistribute resources within the family. By receiving a resource from one child and giving in turn to another child, the older parent can contribute to and manipulate the family economy. If we think of these redistributive pathways as open unidirectional chains (see Gillmore, 1987) then the example in Figure 1 contains several open chains--child A and child B both give to the parent and the parent gives in turn to children A and C (child D is involved in no exchanges with the parent at this time). These flows generate three redistributive pathways: A! Ego! C; B! Ego! C; and B! Ego! A. It is important to note here that, although the parent is engaged in both giving and receiving with child A, this pathway is not distributing resources among family members, and consequently is not considered to be a redistributive pathway for the purposes of this analysis.

We refer to these patterns as open chains, but it is possible that these chains could be closed by a transfer between two children. The latter situation represents "generalized exchange," a concept in the sociological literature that signifies indirect reciprocity among people (Ekeh, 1974). Measurement of generalized exchange in the family, however, requires data on flows among *all* family members.

Unfortunately, these data have no information about transfers that do not involve the older parent, and therefore whether these chains are in fact ultimately closed by a transfer among the two children is unknown. The open chain measure used in this study still captures complex redistributive flows among family members, though it does not completely identify flows between all family members. However, by empirically examining the degree to which older people are involved in redistributive pathways with their children, we gain a better understanding of the role played by an older parent in the management of resources within the family network and advance research on family transfers beyond what dyadic measures can portray.

DATA

Data are from the 1989 Taiwan Survey of Health and Living Status of the Elderly and the 1996 Philippine Elderly Survey, nationally representative surveys of persons aged 60 and older in Taiwan and 50 years and older in the Philippines. The final analytic samples are restricted to adults aged 60 years and older who have two or more living children (3,484 in Taiwan and 1,191 in the Philippines). Approximately 92 percent of older Filipinos and 91 percent older Taiwanese have two or more living children. The data are ego-centric, meaning that all transfer information is collected with respect to the older person (ego). However, these data bridge standard ego-centric and sociometric methods of gathering information about social network structure (Marsden, 1990). Ego-centric approaches ask respondents to name alters and then elicit information about those alters from the respondent. Sociometric approaches ask respondents to name alters within a community and then interview everyone in that community. These data bridge both approaches because there is a complete enumeration of family members and how they are related to each other while information about resource transfers was obtained only for transfers involving the older respondent.

The lack of information about transfers among the other actors in the network is an unfortunate drawback of ego-centric data. However, the availability of a large, nationally representative dataset from which even ego-centric network measures may be constructed constitutes an important step forward. Only one-fifth of studies of social networks of the elderly in the last decade have analyzed databases of 1,000 or more respondents (Litwin, 1996).

Survey questions were asked about transfers between parents and children made within the past year (Appendix A). Information on transfers was collected separately for each child and was elicited for three transfer currencies. Transfers between parents and children may consist of money, material goods, or services (physical care and help with daily activities). Both surveys are rich in detail about the currency of transfers and the people involved, both within and between households, but the surveys are limited in measurement of the volume or magnitude of flows. It is therefore not possible to quantify the amounts being transferred in each flow. For example, detailed information on assistance with personal care (help with bathing, dressing, and toileting) and help with instrumental activities (shopping, meal preparation, transportation, and managing finances) are collected for both intra- and inter-household care, but the frequency, number of tasks, and duration of these services is unknown.

RESULTS

The measure most often used in social network analyses of the flow of resources to or from older persons is the size of the active network. Figure 2 shows the relationship between the number of children actively involved in transfers and the total number of living children. The relationship of the activated to the potential exchange network varies between the two countries. In Taiwan, there is substantial variation in children's involvement in transfers across all family sizes. In the Philippines, in contrast, the greatest density is found along the diagonal indicating that, in most families regardless of family size, all the children are involved in exchanges with their older parents. This pattern is consistent with broad differences in culture: Chinese families select certain children, usually a married son, for parental support in old age, whereas obligations for parental support are more broadly distributed among children in the Philippines.

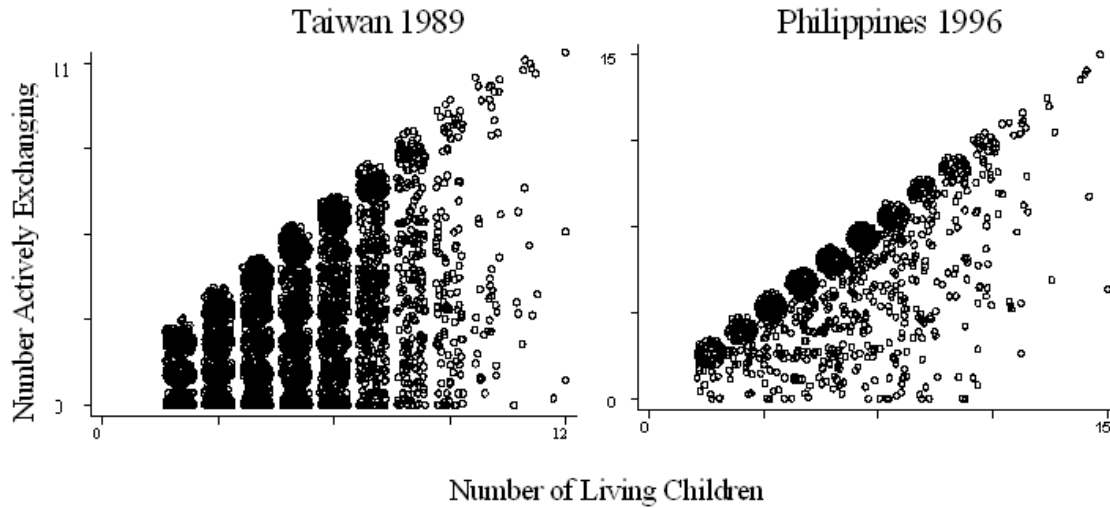


Figure 2. Number of children actively exchanging by the total number of living children available

In order to describe more fully the exchange activity in the family network we move from an examination of network membership to an analysis of transfer activity in terms of ties and pathways of resource flows. These units may be best described in terms of the schematic in Figure 1. *Ties* represent a one way flow between the older person and one of their children (a single arrow in the diagram), and a *pathway* describes a two-step flow of resources beginning, in this example, with one child giving to the parent who gives to another child. Each of these units is used to develop summary measures of transfer activity presented below. Table 1 shows the univariate distributions of all of the network measures.

The extent to which a given kin network is actively engaged in transfers among its members may be quantified using counts and ratios of the number of active ties and paths relative to the total possible. First, the number of *active ties* is calculated by taking the sum of all inflows and outflows of resources currently being given and received between the older person (i) and all members ($1 \dots F$) in their family:

$$\sum_{k=1}^F [T_{ik} + T_{ki}] \quad (1)$$

where T_{ik} represents an outflow of resources from the older person (i) to family member (k); and T_{ki} represents an inflow to (i) from (k).

The number of active ties shows a positively skewed distribution in both countries (Table 1), but most older respondents are actively involved in exchanges with children. The average number of active ties is 2.8 in Taiwan and 6.9 in the Philippines, and over 80 percent of Taiwanese and 98 percent of Philippine parents have 1 or more ties with children activated. Though the mean is lower in Taiwan, over half of the Taiwanese sample is involved in 3 or more transfers, and 87 percent of older Filipinos were involved in 3 or more transfers. In Taiwan, the largest family had 12 children or 24 possible ties, while the maximum observed was 18. In the Philippines, the largest family had 15 children, or 30 possible ties, with the highest observed value of 25. Thus it appears that the largest families were not fully activated, indicating a potential threshold in the number of children that may be involved in resource transfers with parents, but it is difficult to interpret these observations further without standardizing this measure by family size.

Table 1. Univariate Statistics for social network measures of exchange activity among adults aged 60 and older with 2 or more living children: Taiwan (1989) and the Philippines (1996)

	Standard						
	Mean	Deviation	Median	Min	Max	Skew~	Kurtosis~
<i>Active ties*</i>	(nties)						
<i>Taiwan</i>	2.83	2.29	3.00	0	18	0.84	0.80
<i>Philippines</i>	6.89	4.17	6.00	0	25	0.990	1.99
<i>Exchange activation*</i>	(exact)						
<i>Taiwan</i>	0.28	0.20	0.25	0	1	0.23	-0.51
<i>Philippines</i>	0.56	0.26	0.50	0	1	0.08	-0.12
<i>Open Chains*</i>	(ochains)						
<i>Taiwan</i>	0.45	2.35	0.00	0	72	13.02	284.91
<i>Philippines</i>	10.55	17.46	4.00	0	144	3.38	18.68
<i>Generalized Exchange Activation*</i>	(geact)						
<i>Taiwan</i>	0.02	0.10	0.00	0	1	6.52	50.89
<i>Philippines</i>	0.29	0.34	0.15	0	1	1.10	0.16
<i>Multiplexity*</i>	(mplex)						
<i>Taiwan</i>	0.74	0.61	0.67	0	3	0.91	0.66
<i>Philippines</i>	1.55	0.64	1.71	0	3	-0.66	-0.14
<i>Multiplexity of Active Ties**</i>	(mplex2)						
<i>Taiwan</i>	1.36	0.51	1.00	1	3	1.36	1.26
<i>Philippines</i>	1.84	0.41	2.00	1	3	-0.37	0.46

* N=3,484 (Taiwan) N=1,191 (Philippines)

** N=2,877 (Taiwan) N=1,161 (Philippines)

The *exchange activation* measure indicates how fully engaged the respondent's family exchange network is relative to its size. This score is a measure of network density, though it is different from traditional density measures that (as a rule) exclude all ego-alter ties because these are usually the ties that define the network (Wasserman and Faust, 1994). In the present case we are not under such restrictions because the boundaries of the network are defined not by ego-alter transfers, but instead by family relationships. Therefore, we can estimate a density measure that is akin to a sociometric density measure by calculating the proportion of all *possible* ties involving the respondent that are currently activated. The exchange activation score is obtained by dividing the number of active ties by the total possible inflows and outflows in ego's kin network:

$$\frac{\sum_{k=1}^F [T_{ik} + T_{ki}]}{2F} \quad (2)$$

where the numerator is the count of active ties described above and the denominator is $2F$, or twice the number of members in the kin network (equivalent to the total number of possible in- and out-flows in the network).

As shown in Table 1, the exchange activation score is by definition bounded by 0 and 1 and has a slightly positive skew. The negative kurtosis scores indicate a bimodal distribution, with peaks at 0 and at .5. About 18 percent of Taiwanese respondents show no exchange activation and 25 percent are at a 50 percent activation level. In very few cases is more than half of the possible activity in the older parent's network taking place. In the Philippines, although less than 3 percent of families have a score of 0, fully one-quarter of families show exactly 50 percent of all possible exchange activity¹.

While exchange activation is a useful summary of the ties between older persons and their children, it is basically an aggregation of dyadic activity. We now move to a more distinctively network-based approach by looking at the pathways of resources that involve multiple family members.

As described above, concurrent transfers can be summarized as a set of redistributive pathways, represented by an open unidirectional chain via which resources flow from child (A) to child (B) through the older parent. Like the dyadic measures, the intensity of redistributive exchange can be estimated as a count or standardized according to the size of the kin network. The count is the number of paths along which resources flow from one member of the network to another through ego. The number of *open chains* is calculated by taking the sum of all paths through ego from one member of the kin network (k) to other members of the kin network (j),

$$\sum_{k=1}^F \sum_{j=1}^F [T_{ki} T_{ij}] \quad (3)$$

where T_{ki} are flows to the older person (i) from network member (k) and T_{ij} are flows out from the older person to other members of the kin network (j), where $k \neq j$.

Two-step pathways that are reciprocal (i.e., where resources flow from a child to the older parent and return to the same child) are not counted in this measure, as these flows would be reciprocal rather than redistributive flows. They do, however, contribute to other open chains. For example, in the family represented in Figure 1 there are 3 open chains, one of which begins, and one of which ends with child A, who is both giving to and receiving from the parent.

Table 1 shows that involvement in redistributive exchange as measured by the number of open chains is much more limited in Taiwan than in the Philippines. The extremely high kurtosis for Taiwan indicates that the distribution is highly concentrated around one value, which in this case is zero — about 90 percent of the sample has no open chains involving children. Those who are a part of open chains are involved in not only 1 but up to 72 such pathways (the latter case is a family with 9 children, all of whom are both giving and receiving with the older parent). However, high numbers of open chains are relatively uncommon in Taiwan, even among those with redistributive activity. Almost 25 percent of those involved in any open chains are involved in only two.

In the Philippines, while the distribution of the open chain measure is still positively skewed, the distribution is much flatter than in Taiwan. Indeed, the majority of older parents have at least one open chain (64 percent) and more than half are involved in three or more of these pathways up to a maximum of 144.

To standardize the measure by the size of the kin network, we divide by the maximum number of possible pathways through which ego can connect alters in the kin network (in this case, all of the adult children) to each other. *Redistributive exchange activation* is computed by dividing the number of open

¹This measure is not equivalent to the proportion of the members of the network involved in transfers because it takes into account both transfers to and from the older person. For example, if all the children in the network were giving but none receiving resources from the parent, exchange activation would be 50%, though involvement would be 100 percent.

chains by F (the number of children) multiplied by $F-1$. This denominator accounts for all possible non-reciprocal two step pathways, excluding those that originate with a particular child and return to that same child, just as described above under the number of open chains:

$$\frac{\sum_{k=1}^F \sum_{j=1}^F [T_{ki} T_{ij}]}{(F * (F - 1))} \quad (4)$$

The redistributive exchange activation score is by definition bounded by 0 and 1. As a result of the low level of redistributive activation in the Taiwanese sample, the mean for this measure is only 0.02, and the skew and kurtosis of the distribution are quite high (shown in Table 1). Among those involved in redistributive pathways, activity is concentrated mainly in the area below 0.5, showing that most Taiwanese families exhibit less than half of the possible redistributive exchange activity between older parents and their children. At the same time 5 percent of those with any redistributive exchange activity have a score of 1.0, indicating that some families have all possible open chains activated.

Among Philippine families, redistributive exchange activity is much higher. The mean is 0.29, indicating less concentration around zero. Only about one-third are not involved in any redistributive pathways, and the distribution of scores is much closer to a normal distribution, with only a slightly positive skew and negative kurtosis.

Describing these pathways as redistributive does not in and of itself explain the motivations for these transfers or presume that they are related in the minds of the giver and receiver. For example, although a parent might state that he or she is giving assistance to a daughter because the daughter needs help with cooking, the ability of the parent to give this support to the child who needs it may depend upon material or financial contributions from another child. In this sense the two transfers can be perceived as being independent in the mind of the parent, while they are in fact interdependent within the family system.

The measures described thus far treat ties as binary indicators of the presence and direction of transfer flows between the respondent and his or her children. We now move to exchange measures that incorporate the volume and type (or currency) of resources transferred within the respondent's kin network.

Multiplexity measures the average number of currencies being transferred between older parents and their children, calculated by dividing the total number of *valued flows* by the total number of children in the family. The number of valued flows is the total number of currencies being given and received in parent-child pairs. In these data, each transfer may consist of up to three currencies (money, material goods, or services), meaning that the maximum number of valued flows is equal to three times the number of children in the family. Multiplexity is calculated as:

$$\frac{\sum_{k=1}^F \sum_{c=1}^3 [\max (T_{kic} , T_{ikc})]}{F} \quad (5)$$

where $\max(T_{kic}, T_{ikc})$ represents the total number of currencies (c) being transferred in either direction between the older parent (i) and each family member (k) and F is the total number of children in the family. Multiplexity has a minimum of 0 and a maximum of 3 (derived from the three currencies of money, material goods, and services). In a family with a multiplexity score of 0, there are no transfers of any currency, whereas a multiplexity score of 3 indicates that the older parent is engaged in transfers of all three currencies with all children.

For Taiwan, multiplexity is only slightly positively skewed and relatively flat. However, there is integer heaping, with 18 percent of the sample at zero and smaller peaks at 0.5, 1.0, and 2.0 as well. Both the mean and the median number of currencies being transferred is less than 1. This is influenced by both the proportion of families with no exchange activity in the sample (18 percent) and the limited number of currencies being exchanged. In the Philippines, the diversity of resource flows is higher, with a mean of 1.55 and a median of 1.7. The modal value for this sample is 2.0 with 23 percent of the families exchanging an average of 2 currencies in each parent-child dyad.

To examine the multiplexity of ties apart from the influence of the proportion of families who are not involved in any exchanges, which is much greater in Taiwan than in the Philippines (18 percent versus 2.3 percent), we calculate a measure of the *multiplexity of active ties*,

$$\frac{\sum_{k=1}^F \sum_{c=1}^3 [\max(T_{kic}, T_{ikc})]}{2T} \quad (6)$$

where the number of valued flows in the numerator is divided by two times the number of active ties ($2T$) rather than the number of family members in the network. This changes the minimum value of the variable to 1, as families with no transfers ($2T=0$) are excluded.

Table 2. Correlation matrix of social network measures of exchange activity among adults aged 60 and older with 2 or more living children and 1 or more active ties: Taiwan (1989) and Philippines (1996)

	Active ties	Open chains	Exchange activation	Redistrib. exchange activation	Multi-plexity	Multi-plexity of active ties
Active ties* (<i>nties</i>)	1.00 1.00					
Open chains* (<i>ochains</i>)	0.43 0.87	1.00 1.00				
Exchange activation* (<i>exact</i>)	0.71 0.68	0.37 0.58	1.00 1.00			
Redistributive exch. activation* (<i>geact</i>)	0.31 0.60	0.70 0.66	0.51 0.89	1.00 1.00		
Multiplexity* (<i>mplex</i>)	0.53 0.45	0.20 0.25	0.78 0.74	0.30 0.45	1.00 1.00	
Multiplexity of active ties** (<i>mplex2</i>)	0.46 0.06	0.14 0.07	0.57 0.27	0.19 0.20	0.76 0.66	1.00 1.00

* N=3,484 (Taiwan) N=1,191 (Philippines)

** N=2,877 (Taiwan) N=1,161 (Philippines)

The univariate statistics for the multiplexity of active ties (Table 1) indicate that differences between the two countries are much smaller. In Taiwan, the average number of currencies being transferred in a parent-child pair is 1.36, with a median of 1. In the Philippines, the comparable numbers are 1.84 and 2.0. This confirms that most of the transfer activity in Taiwan is in single flows of individual currencies, and implies that most Taiwanese families target the activation of their exchange network

to meet specific needs while families in the Philippines appear to have a more broadly active family network, giving and receiving in multiple currencies.

This measure is a useful amplification of the multiplexity measure and more precisely reflects the resources that are being transferred in the active exchange network, but the exclusion of cases with no transfer activity from the measure is a drawback in developing network variables that can be used in multivariate analyses, as important information about the level of activity in the sample is lost.

The measures presented here are examples. They are intended to provide the basis for developing generalized network algorithms that incorporate other characteristics of kin structure and transfers that can be tested in substantive hypotheses.

The development of network measures of intergenerational transfers extends existing ways of looking at resource flows in families and captures specific dimensions of family resource distribution parsimoniously. It is therefore necessary to determine the extent to which these network measures capture unique aspects of familial transfer patterns. In this section, we present bivariate correlations of the six measures described above.

Table 2 shows a correlation matrix of the measures described above, calculated only for older persons engaged in 1 or more transfers with their children in order to avoid the influence of perfect correlations among families with no exchange activity. The count variables are listed first (i.e., active ties and open chains) followed by activation scores.

As expected, there is a high correlation between the count variables and their standardized versions, $r=0.71$ for the number of active ties and exchange activation in Taiwan, and $r=0.64$ for the number of open chains and redistributive exchange activation in the Philippines. There is a very strong correlation between overall exchange activity and redistributive activity in the Philippines, though not in Taiwan. The high correlation between multiplexity and exchange activation (0.78 in Taiwan and 0.70 in the Philippines) implies that more active exchange networks have greater breadth in the currencies that they distribute, while less active exchange networks are more specialized.

Another important aspect of the development of network measures of intergenerational transfers is to determine the extent to which they convey information independent of the underlying family structure and living arrangements of families. We present below a multivariate analysis of the number of open chains to examine how family structure and living arrangements are related to transfer patterns. Table 3 shows the means and standard deviations for three sets of independent variables included in the multivariate models. First, a set of variables representing basic demographic characteristics of respondents is included: these are age (in single years), sex, and self-reported health status (response categories are poor or fair health versus good or excellent health). These variables are retained in the models to control for basic variation in demographic effects. The Philippines sample is slightly older on average, contains a higher proportion of women, and has a much higher proportion of elderly reporting that they are in poor or fair health compared to the elderly in Taiwan.

The second set of variables represents family structure characteristics: marital status (married or not married), the number of living children, and the age of the youngest child. Overall, 69 percent of the Taiwanese elderly are married compared to 57 percent of the Philippine elderly. While older persons in the Philippines have more living children on average than in Taiwan (6 versus 5), the average age of the youngest child is about the same (31-32 years).

The third set of variables represents living arrangements of older adults. Living arrangements are indicated by two dummy variables comparing living with unmarried children only or living with one or more married children with older adults who live with no children. More than half of older Taiwanese live with one or more married children compared to 22 percent who live with only unmarried children and 22 percent who do not live with any of their children. In the Philippines, approximately

equal proportions fall into the three groups, with 37 percent coresiding with married children, 36 percent with unmarried children only, and 30 percent living with no children.

Table 3. Definitions and means of the independent variables adults aged 60 and older with 2 or more living children: Taiwan (1989) and the Philippines (1996)

Variables	Taiwan (n=3,484)		Philippines (n=1,191)	
	Mean	S.D.	Mean	S.D.
<i>Demographic</i>				
Age (60-90+)	68.12	6.40	69.12	7.19
Female	.45	.50	.56	.50
Poor or fair health	.23	.42	.51	.50
<i>Family structure</i>				
Married	.69	.46	.57	.50
Number of living children	5.12	1.95	6.36	2.50
Age of youngest child	30.96	8.11	31.72	59.52
<i>Living Arrangement</i>				
Unmarried Coresident Children Only	.22	.41	.37	.48
Married Coresident Children (may include others)	.56	.50	.36	.48

Table 4 shows the coefficients from a regression model of the number of Open Chains. We use a Poisson regression model because the outcome variable is a count variable and also a rare event, with a distribution dominated by zeros (McCullagh and Nelder, 1989). The model is not intended to be explanatory, but rather to explore the association of involvement in redistributive exchange with family characteristics.

Family structure is strongly associated with the number of open chains in which the older person is involved. Because the outcome variable is a count measure rather than the standardized activation score, the number of living children acts as a control for family size in the model, and it is significantly and positively related to the number of flows. The presence of a spouse in the household appears to have a buffering effect, reducing the number of pathways among children involving the older parent, though this is not significant in the Philippines. There is an inverse relationship with the age of the youngest child, possibly representing the greater role of the parent in controlling resources that go to younger children, though the effect is quite weak in the Philippines.

Living arrangements also are associated with the number of open chains, though much more strongly for Taiwan. Among Taiwanese parents, those who live with a child, especially an unmarried child, are involved in more redistribution of resources than those whose children all live outside the household. In the Philippines, the effects are modest and significant only for those living with one or more married children. It is important to remember that living arrangements and other intergenerational transfers may be jointly determined, so this relationship cannot be considered causal. The results from the Poisson model further confirm that there is a consistent and positive association between the level of redistributive flows and children's coresidence, though this varies between the two countries.

Table 4. Coefficients from a Poisson regression model of the number of Open Chains among adults aged 60 and older with 2 or more living children: Taiwan (1989) and the Philippines (1996)

Variables	Taiwan	Philippines
<i>Demographic</i>		
Age	-0.037 *	-0.029 *
Female	0.441	0.180 *
Poor or fair health	-0.376 *	-0.046 *
<i>Family structure</i>		
Married	-0.399 *	-0.030
Number of living children	0.252 *	0.251 *
Age of youngest child	-0.033 *	-0.002 *
<i>Living Arrangement</i>		
Co-resident unmarried kid	0.639 *	0.015
1+ co-resident married kid	0.357 *	0.072 *
N	3,484	1,191
Model Chi-square	903.0*	6196.3 *

* p < .001

DISCUSSION AND CONCLUSION

We have argued in this paper that a dyadic approach to family transfers provides only a partial explanation of family exchange behaviour. The network approach advocated here enables researchers to examine transfer activity involving multiple actors, multiple directions, and multiple currencies. Our aim has been to adopt a network approach to family transfers by constructing several network measures of intergenerational transfers and applying these measures to nationally-representative samples of older Taiwanese and Philippine adults.

Six illustrative social network measures were constructed to describe complex patterns of transfers among older parents and their children. These measures showed that most Taiwanese elderly are involved in transfers with their children, yet in few cases is more than 50 percent of the parent-child network activated. Involvement in redistributive exchange is relatively uncommon among the Taiwanese elderly: about 90 percent of older adults have no open chains (i.e., receive resources from one child and give resources to another child). Of those who do engage in redistribution, the intensity of activity is rather low. Most transfer activity is in flows of single currencies and tends to be concentrated among a subset of adult children within the family, indicating specialization in transfers with children. The coresidence of adult children appears to play an important role with regard to transfer activity, though it is not the sole location of parent-child transfers.

In the Philippines, nearly all older parents with two or more living children are involved in transfers with their children, and the majority are involved in 3 or more transfers. Older Filipinos also are much more likely than their Taiwanese counterparts to be involved in redistributive transfers, to do so more intensively, and to exchange a greater number of different types of resources on average. Coresidence appears to play a less important role in facilitating the redistribution of resources by older adults.

The comparisons of our measures of exchange behaviour across two countries provides a good example of the usefulness of standardized measures in examining family support across different cultures. The relatively low prevalence of redistributive exchange observed in Taiwan is not entirely surprising because strong normative rules about giving behaviour in Taiwanese families lead us to expect that children will more often be giving resources to their aged parents rather than receiving them. In the Philippines, rules are less focussed on married sons and consequently, exchanges are more likely to vary according to economic needs of the children rather than coresidence or other characteristics. These relationships merit further attention.

A limitation of the analysis is that family transfer activity is measured only at one point in time. Exchanges between parents and children take place across the life course, but the measures shown here focus on transfers in a single year. The possible relationship of early life investments by parents in their children (such as in education) to later life support by children is not considered here. Thus, transfer patterns among multiple family members that might be characterized as redistributive if examined over time are neglected.

This study also focuses on a subset of familial transfer activity — between older parents and their children. While older persons are most often on the receiving end of resources from children, they also may be passing resources along to siblings, parents or other relatives. The same measures that are used here to examine parent-child exchanges can be used to describe patterns of resource transfers among a broader set of family members and across generations.

Two additional areas of future research deserve consideration. First, many more empirical studies of family exchange are needed in order to examine critically the assumption that the extended family functions as a network of mutual obligation and support (see Cain's (1982) criticism of this assumption for South Asian families). In other words, to what extent does the family network truly operate as a "safety net" for its members? The research literature still lacks a strong empirical base documenting the variability within ideal-type family system models (such as strong norms of filial obligation within Asian families).

Another goal for future research is to use these standardized measures of family network activity as explanatory variables for such important outcomes as the physical or mental health status of older persons. The literature on the effects of social support on health is vast, especially for Western countries, and social support has consistently been found to be a buffer against morbidity and mortality (Berkman and Syme, 1979; Haines and Hurlbert, 1992; House et al., 1988; Seeman et al., 1987; Silverstein and Bengtson, 1991). Network measures of resource flows would further clarify the relationship between social support and individual well-being. In addition, characteristics of an older person's intra-familial exchange network and their position in that network could serve as independent predictors of other important life course events such as retirement timing or migration (see Wenger, 1997) or the adoption of formal care services (long-term and acute) and assistive technologies. For example, a small study of elderly in Taipei, Taiwan found that those older parents who provided instrumental assistance to family members were less likely than others to be admitted into a nursing home during the study period (Wu et al., 1997).

Measures such as the ones we suggest in this paper can be used to examine transfer patterns among other family members at various stages of the family and individual life course. With the increasing number of nationally-representative data sets that include information on family exchange activity, the research community is afforded many new opportunities to understand how family exchange systems, and the resources they make available, are connected to individual outcomes.

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Appendix A – Survey Questions about Transfers

For each type of transfer (money, material goods or services), a series of questions was asked that identified the people involved. Parallel information was collected for both giving and receiving transfers with specific members of the family. In addition, characteristics of members of the family and household are documented in great detail. Children were individually identified and a number of characteristics were gathered about them (e.g., such as their place of residence, marital status, and so on). Somewhat more limited information was collected on other types of kin (parents, siblings, and grandchildren). While the direction of flows and the characteristics of the participants were documented, little information was collected about the quantity of support flows (e.g., hours of time or specific amounts of money). The exact survey questions on transfers in the 1989 Taiwan Survey of Health and Living Status of the Elderly are described below.

When the respondent gives support to any individual, for each main type of support (activities of daily living, instrumental activities of daily living, financial transfers and provision of material support) the respondent was asked:

"Do you currently (provide assistance to anyone in the form of _____/give money to someone to help him or her/ provide material support on a regular basis or through special gifts of food or clothing) to anyone?"

If the answer is yes, they were then asked the following two questions:

"To whom do you (provide this assistance/give this money)? Anyone else?" and

"In the past year, who was helped most in this way?"

When any individual gives support to the respondent, for each main type of support (activities of daily living, instrumental activities of daily living and other services, financial, or material), the respondent was asked:

"Is there anyone who (helps you with bathing, etc./ gives you money to help you now/ gives you food or clothing or other goods to help you now)?" or "Do you currently receive any assistance from any of these sources with daily activities such as household chores, etc.?"

If the answer is yes, they were then asked the following two questions:

"Who provides this (assistance/support) to you? Anyone else?"

and

"In the past year, which person (or service) was most important in terms of (providing physical care assistance to you/ assisting you with your daily activities/ providing financial support to you/ providing material support to you)?"

Social Network Centrality and Sexual Experience Among a Household Sample of Urban African American Adolescents¹

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Little is known about whether adolescents' sexual behavior is influenced by their place in their social networks. Adolescents who are central to a network may be affected differently by peer norms than a more peripheral network member. The objective of this study was to test the hypothesis that urban African American youth who are well-integrated into their peer networks, i.e., those with higher closeness centrality, would be more likely to be sexually experienced. The sample consisted of a probability based household telephone sample of African American adolescents (index participants) and three of their social friends. We enrolled 86 index adolescents and 111 close friends. We did not find an association between closeness centrality and sexual experience among the index adolescents. However, we did find an association among the friends ($p < .05$). Fifty percent of those with low closeness scores were sexually experienced while 74% of those with high closeness scores were sexually experienced. Adolescents' location in their social world is associated with sexual behavior among the close friends of a household sample of urban African American youth.

INTRODUCTION

The biological, emotional, and psychological vulnerability of adolescence accentuate potential negative outcomes of sexual activity, such as sexually transmitted diseases and unwanted pregnancy. Efforts intended to delay onset of sexual behavior would benefit from additional information about determinants of this behavior. One important area of investigation in this area is the role peers play in

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the onset of sexual behavior (oral, anal, or vaginal intercourse). Studies show that adolescents' perceptions and attitudes about their peers' behaviors as well as the peers' self-reported behaviors are influential. Adolescents who perceive that their peers have actually engaged in sexual intercourse and those who perceive that their peers are accepting of sexual intercourse are more likely to be sexually experienced (Dolcini and Adler 1994; Ennett, Bailey, and Federman 1999; Ennett and Bauman 1996; Ennett, Bauman, and Koch 1994; Fletcher, Darling, and Dornbusch 1995; Sionean and Zimmerman 1999; Urberg *et al.* 1995; Wasserman and Faust 1994).

Little is known, however, about whether adolescents' sexual behavior is reflected by their place in the social network. Adolescents who are central to a network may be impacted by their friends' attitudes and behaviors differently than more peripheral network members. Information about the extent to which degree of integration into the social network impacts sexual behavior would provide valuable data for network based interventions (Hawkins *et al.* 1999; Latkin *et al.*, 1996).

Closeness centrality provides a meaningful way to assess adolescents' integration into the social network (Valente and Foreman 1998). Closeness centrality is defined as the sum of the number of steps it takes to get from the index person to all other people in their network and reflects how quickly information originating in the social network can reach the index person (Wasserman and Faust 1994). Thus, the first objective of this study was to test the hypothesis that young people who are well integrated into their peer networks, i.e., those with higher closeness centrality, would be more likely to be sexually experienced. Notably, we have chosen to study the networks of a community-based sample of adolescents because adolescents live in multiple worlds. Recent studies have concentrated on school-based social networks (Ennett, Bailey, and Federman 1999; Ennett and Bauman 1996; Ennett, Bauman, and Koch 1994; Urberg *et al.* 1995; Wasserman and Faust 1994). In reality, social networks are not limited to the school setting, and fellow students are may not necessarily be the peers of greatest influence (Way and Chen 2000).

The current paper presents an approach that randomly selects participants from a probability household population and then uses these index participants as the starting point for the recruitment of additional social network members. A potential bias associated with this methodology is that the procedures for recruiting participants may inflate centrality scores. The index participants are randomly selected and are a random mixture of central and non-central group members. However, participants recruited through the index participants are more likely to be well-integrated members of their social network because they were nominated as a friend and not randomly selected. Any association between centrality and sexual activity must first be adjusted for the artificial upward bias of centrality scores in the friends recruited through the index group. Another important confounder may be the age of the adolescent. Older adolescents may be more likely to be sexually experienced and older adolescents may also have had more time to develop friendship groups and become better integrated into these groups. Thus, our second objective was to examine the effects of index status and age on the relationship between closeness and sexual activity.

METHODS

Sample and Procedures

The sample consisted of a probability based household telephone sample (random digit dialing) of African American adolescents (telephone coverage in San Francisco is estimated to be between 95-100% (Lavrakas 1987)) and their social friends. Parental/guardian consent was obtained for those under 18 years of age and youth consent/assent was obtained for all participants. We initially screened household on residence (zip code), ethnicity (African American), and age eligibility (one adolescent household member). The cooperation rate for the initial household screening was 70%. All households meeting initial eligibility and consenting requirements continued with a fifteen-minute second screening that determined "friendship eligibility" (i.e., final eligibles had to have at least two close friends aged 13-21 living in or adjacent to the study neighborhood). In order to determine friendship

eligibility, participants were asked how many friends they had. Respondents who reported having more than one friend were then asked, "Now we would like to ask about your close friends. When we say close friends, we mean friends you may hang out with more than others, or trust more than others. How many close friends would you say you have?" Subsequent to this, youth were asked a series of questions about up to five or six close friends (Dunphy 1963) including information on friend's age, gender, and place of residence (by city and neighborhood within study city).

One hundred and sixty-four African American adolescents completed the telephone screening interviews. Seventy-three percent of initially eligible adolescents were subsequently eligible based on the friendship screening ($n = 119$). There were no statistically significant differences between the respondents meeting this final eligibility criteria and ineligible youth with respect to age, gender, school status, job status, or having a parent living in the household.

Next we conducted in-person interviews at our field office located in the study neighborhood. Index participants were asked to recruit up to three friends to participate in the study. Enrolled friends also completed an interview. Eighty-six of the eligible indexes completed the face-to-face interview and named 330 close friends (mean named = 3.6 friends, standard deviation = 1.4). One hundred eleven friends were successfully recruited into the study. We examined potential biases between indexes who recruited all the friends they attempted (46%), those who recruited some (38%), and those who recruited no friends (16%). There were no differences in success of recruitment by gender. Those who were unable to recruit any friends were somewhat older (16.7 years) than those who recruited all friends (15.6 years), $p = .05$, but did not differ in age from those who recruited some friends. Those who recruited some friends had listed more friends than those who recruited all their friends, $p = .05$.

Measures

The face-to-face interview covered multiple topics including demographic characteristics, sexual and other health compromising behaviours, and friendship issues. We present details of relevant measures below. The complete instrument is available from the authors.

Demographic Characteristics. We obtained the following demographic information: birth date, ethnicity, whether or not respondent was currently in school, level of education (highest grade completed), and whether or not respondent had a job.

Sexual Behavior. After a series of questions about non-coital sexual behaviours, we defined three types of sexual intercourse (vaginal, anal, and oral) and then we asked, "Some people have sex when they are teenagers and other people wait to have sex until they are older, and others never have sex. Have you ever had sex? Remember, that includes vaginal, anal, or oral sex."

Analysis

All friendship pairs (dyads), regardless of whether they were reciprocated or not, were used to create the relational matrix which was symmetrized and analyzed for closeness in UCINET 5.0. Data were then imported into SPSS 9.0 where we first examined the association between sexual activity and age, closeness, and index status (index vs. friend). Following this, we examined the association between closeness, age, and index status. Finally, in order to determine whether index status or age confounded or moderated the relationship between closeness and sexual activity, we stratified by index status and age to examine the association between closeness and sexual activity.

RESULTS

Of the 197 participants (indexes and friends), 110 (55.8%) were male. The mean age was 16.3 years ($SD=1.5$); 77.2% were between 13-16 years old (younger adolescents) and 22.8 were between 17-23 years old (older adolescents and young adults). Approximately 66% of participants were sexually experienced and of these 89% had been active within the past year. Thirty percent of participants had

closeness scores of .16 and 70% had scores of .17. Figures 1a and 1b are examples of components containing a low and high centrality score participants, respectively.

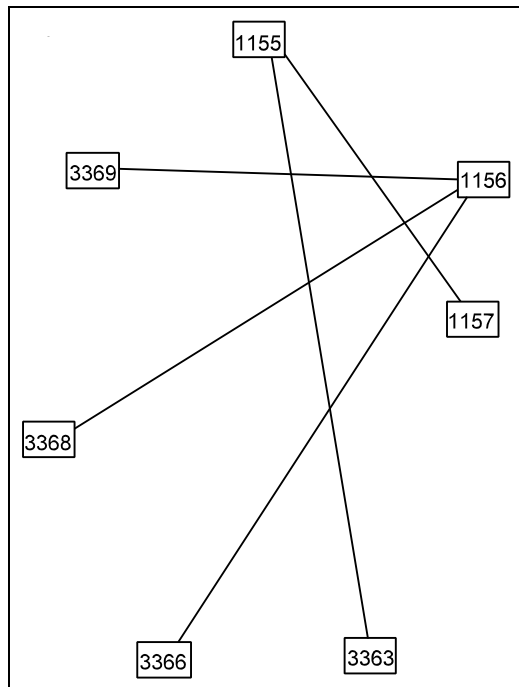


Figure 1A
Component with low centrality participants.

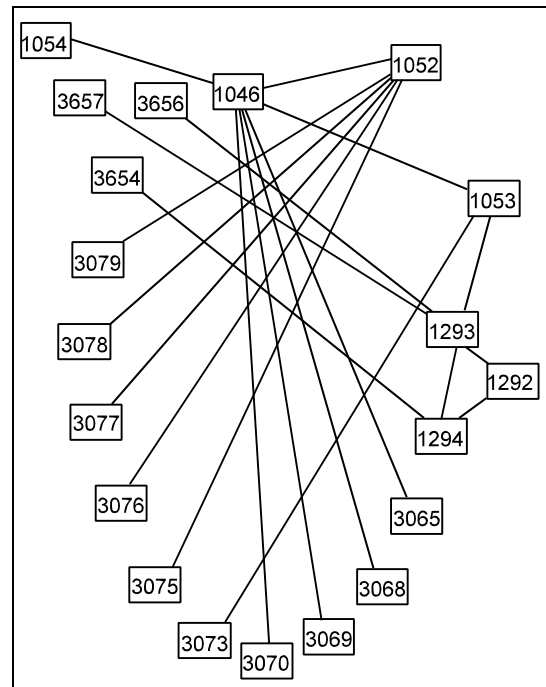


Figure 1B
Component with high centrality participants.

Table 1. The association between closeness and a history of having engaged in vaginal, anal, or vaginal sex stratified by index status (N=197)

Index Status	Closeness	Sexually Experienced, %(n)		p-value
		Yes	No	
Index	.16	68.6 (24)	31.4 (11)	.273
	.17	56.9 (29)	43.1 (22)	
Friend	.16	50.0 (12)	50.0 (12)	.028
	.17	73.6 (64)	26.4 (23)	

We found that older participants were more likely to be sexually experienced ($p < 0.01$); 95.6% of participants aged 17 years and above were sexually experienced compared with 56.6% of participants aged 16 years and below. Neither index status nor closeness was related to sexual activity. We did find an association between index status and closeness ($p < 0.01$). We found that 58.8% of index participants had closeness scores of .17 and 79% of friend participants had closeness scores of .17. In addition, we did not find an association between older age and closeness.

In order to further explore the relationship between closeness and sexual activity, we examined the relationship between closeness and sexual activity stratified by index status (index vs. friend). We found that index status moderated this relationship (Breslow-Day Test < 0.1). Among the index participants, there was not a significant relationship between closeness and sexual experience but among friend participants there was a significant association ($p < 0.5$). Among friend participants, 50% of those with low closeness scores were sexually experienced while 74% of those with high closeness scores were sexually experienced. Finally, age did not moderate nor confound the relationship between closeness and sexual experience.

Next, we explored the extent to which our study procedures might have limited the range of closeness scores. First, we examined the size of all the network components. By definition, the size of the component is strongly correlated with the closeness scores of its members. Our study procedures — recruiting and interviewing only independently sampled index participants and up to three friends — clearly put some constraints on the size of the components. Thus, the greater the correlation between component size and closeness score, the more likely that our procedures limited the range of closeness scores. Both inspections of the graphs and quantitative analysis reveal that adolescents' closeness scores were related to size of their component. All adolescents with low centrality score were in smaller components (7 people or less) while all adolescents with high centrality scores were in larger components (8-36 people). When we tested whether component size confounded our results, we did not find a significant relationship between sexual activity and component size, overall and separately for indexes and friends ($p > .1$).

DISCUSSION

This study found that among nominated close friends of a random household sample of urban African American adolescents, those with higher closeness centrality scores are more likely to be sexually experienced. However, no such association exists among those in the household sample. The significant association among close friends supports our hypothesis that adolescents and young adults who are more highly connected to their peers are more likely to have engaged in sexual intercourse and is consistent with the previous studies showing popular students are more likely to have engaged in sexual intercourse (Dolcini and Adler 1994). As with all cross-sectional studies, it is difficult to determine cause and effect. It maybe that sexually experienced adolescents become more connected (e.g., popular) as a result of having had sex. Or, it might be that being more connected to their friends are more influenced by peer norms. We did not directly assess peer norms in this analysis, but our findings would suggest that in this population the norms favor engagement in sexual intercourse. Longitudinal studies are necessary in order to elucidate the pathway more clearly.

The difference in findings between the household sample of index adolescents and their close friends may be related to differences in recruitment procedures, which may have ultimately be related to difference in the characteristics of the adolescents in the two cohorts. One plausible but untested hypothesis is that adolescents recruited from their home are monitored by their parents more carefully than nominated friends (the household sample have to be at home to be enrolled in the study while the friends do not). Parental monitoring, in turn, may have mitigated the influence of peer networks on behavior, as more highly monitored adolescents would have fewer opportunities to engage in sexual behavior despite their centrality in their social network (Li, Stanton, and Feigelman 2000; Li, Feigelman, and Stanton 2000; Stanton *et al.* 2000).

While our study furthers the literature by using a community-based sample of urban adolescents at risk for STDs and HIV and a sociometric approach to explore the relationship between social network integration and sexual behavior, it is not without limitations. Limitations of this study are the low sample size and the lack of information on persons named in friendship grids who could not be contacted. In addition, the fact that we only recruited one generation of friends may have over or under estimated the actual centrality of each participant and the size of the components.

Our findings imply that an adolescent's location in their social world is associated with their behavior. Future studies of the determinants of adolescent sexual behavior would be served by adopting a social network approach, as this will increase our understanding of how peer networks influence adolescent sexual behavior.

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Books

The Postmodern Adventure: Science, Technology, and Cultural Studies at the Third Millennium

Steven Best and Douglas Kellner.
2001.

New York and London: Guilford Press

I have been an appreciative reader of Steven Best and Douglas Kellner's work on postmodernism for several years. Nevertheless, I found that this most recent volume left me with a nagging feeling of frustration. The unease that accompanied my reading was not produced by the authors' failure to provide appropriate examples; nor was it produced by obscurity in the development of their central arguments. Quite the opposite, the illustrations were timely and well presented, and Best and Kellner were conscientious in seeing to the needs of their readers as their theoretical positions were unfurled. The main cause of my frustration was not with things the text lacked, but with things the text over-developed. Put plainly, it was the text's broad and sweeping inclusiveness that I found occasionally off-putting.

In their laudable search for comprehensiveness, Best and Kellner risk surrendering postmodernism to any and all comers. I realize that even as I raise this point some readers will already be on their feet, cheering at the mere idea that the walls securing postmodernism from its detractors may have been breached. My criticism, however, does not go quite that far, for inclusiveness is hardly a bad thing. The difficulty arises, as I see it, when the desire to be inclusive is transformed into a sort of wanton or undisciplined eclecticism. Best and Kellner present a compelling story which focuses with considerable and valuable insight on the interstices in the modern/postmodern interface. But there are features in the argument that

are not easily conceptualized owing to the elasticity of the terms they engage. I am not suggesting a return to logical positivism where the goal was the reduction of language to a form of certainty that could be guaranteed by logical deduction or empirical verification. I accept the necessary hermeneutic struggle that characterizes projects dealing with cultural studies and analyses of the postmodern condition. Still, I have some difficulty accepting completely the enormity of the subjects that Best and Kellner manage to filter through the postmodern lens. Throughout the text, postmodernism is brought forward as cause and consequence, as process and product, and even as fact and fiction. This approach illuminates the contemporary cultural scene in several important ways. Nonetheless, at times I found the glare produced from this illumination rather disorienting.

None of these comments should be interpreted as dismissing the book's overall value, however. An enthusiastic telling of the chronicles of new technology, the *Postmodern Adventure* is also a cautionary tale of the folly of unbridled hubris. In addition, it is a well-crafted adventure story in its own fashion, for the book is an exercise in unraveling the dialectic between the modern and postmodern eras via a narrative sharply energized by a series of spatial metaphors. References to distance and proximity – and images of border transgressions – play key explanatory roles in the text. The "adventure" described in the book's title is both the historical trajectory of human biological and cultural evolution, and the promise of an unscripted future on whose brink lie poised the massive armies of technology and science. What is "postmodern" about the tensions such forces bring into existence is the inevitability of the annihilation of inevitability; the destructuring of structure; and the permeability of formerly rigid lines of demarcation.

Best and Kellner cast themselves in the roles of mapmakers investigating the "violent cartographies" employed by the ideologues of the modernist regimes (Shapiro, 1997). But although they seek out ways to reestablish the coherence of the "social maps" we know as theories, they are insistent that the modernist agenda does not warrant total rejection. Hence Best and Kellner can be regarded as having set themselves the task of striking a balance between a modernist faith in reason, and a postmodern suspicion of foundationalist thinking.

But the adventure, as I have suggested, is sometimes difficult to grasp in its entirety. Because the authors wish to construct a multiperspectival critical theory that will enable them to combine the best elements of modernist thought with the best things found in postmodernism they occasionally produce a series of dichotomous readings that are balanced rather precariously on a constantly shifting foundation. This sort of give-and-take narratology can be perplexing. For instance, readers are told that the postmodern adventure "is the systematic dismantling" of modernist ideology. Yet we are also informed that in the domains of science, "the postmodern adventure strives to overcome all known limits [to scientific knowledge]," even as it "departs from positivism, mechanism, and the coordinates of absolute, three-dimensional space and time" (pages 11, 102 and 110). Hence the postmodern adventure, it would seem is constructive, deconstructive, and reconstructive. I suppose there is nothing particularly wrong with this kind of intellectual flexibility, but at times I found myself confused by the manner in which Best and Kellner combine a trenchant critique of the pretensions of scientific rationality with a curious sidelong approval of various mystical conceptions of multi-dimensional cosmologies. Although there is a good deal of genuflection before the altar of technology in the book, it would be a misrepresentation to say that Best and Kellner have abandoned their critical theory roots and the goals of cultural emancipation. Hence they also recognize the "dark side" of the postmodern adventure in the continuing threat of high-tech war alongside "increasing global insecurities and the possibility of world destruction" (page 92). Still, their analysis of those whose voices are raised against the enframing of the (post)modern world in the discourse of

technological determinism is curiously dismissive, and they express surprise that a large share of recent scholarly literature has been "strikingly technophobic" (page 156).

Best and Kellner provide what may be the most thoughtful overview of their work when they tell us that the postmodern adventure is "a hotly contested journey into the future" (page 155). This is a judgment with which most readers are likely to be inclined to agree, for images of contestation in the form of border patrols, modernist cartographers, and technocapitalism are regular figures in the text. To what extent Best and Kellner are able to overcome the limitations imposed on their analysis by the grandeur of their ambitions is best left for other readers to determine for themselves.

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Abstracts

Clustering Network Data

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Segmenting the market according to consumer's benefits and value orientations – the application of structurally determined laddering method

Bojan Korenini and Zenel Batagelj

As marketing practice accepted the viewpoint that company does best when directing its activities according to the needs and desires of customers in chosen target markets, the necessity for the research methods that would increase the depth of understanding of the consumers emerged. The laddering research method counts as one of new approaches that are trying to fulfill this request. Although there are different approaches to laddering, the method originates in the field of qualitative methodology. Theoretically it draws from means-end theory that treats objects as means to achieving certain valued states, or ends. By using a series of directed probes, typified by the question "Why is this important to you" it identifies the specific linkages between product attributes, consumer benefits and consumer's value orientations. The data create a hierarchical value map. Such map is treated as a directed graph, which shows a unique way in which a product is linked to consumer's personality. There are a lot of different quantitative and qualitative research methods that are aimed at exploring the relationship between the product and consumer's value orientations. In the case of quantitative research methods, there is a lack of information, how specifically different characteristics of a product fit into the consumer's life. On the other hand qualitative methods are better at revealing such information, but because of unstructured nature of such methods they are usually conducted on smaller samples. This fact qualifies them to explore just the respondents under examination rather than to be representative for the whole population of consumers. Laddering overcomes such problems. The method provides information about specific individual-based linkages between consumer product characteristics and consumer's value orientations. Because of structured gathering of the data, method can be conducted on larger samples. There are different approaches to laddering: soft laddering, hard laddering and structurally determined laddering method. The later was developed by the authors of this paper. Although one of the advantages of soft laddering method is that it can be conducted on larger samples, in practice sample size usually

doesn't exceed 50 or 100 respondents, because soft laddering interviews are difficult and require specially trained interviewers. Besides identification of common structures in complex qualitative data is very laborious. Most frequently the type of marketing decisions where laddering method proves supportive require statistically grounded conclusions. The new approach - structurally determined laddering can be conducted on several hundred or more respondents (it can be also conducted over the phone). In this way conclusions of the laddering research are no longer limited to the sample of respondents under the scope. Beside that structurally determined laddering opens a lot of new possibilities, in the sense of analysis and practical application of research results, which depart significantly from the possibilities that soft laddering could offer. Authors of the paper wish to discuss different approaches to laddering method in the context of quantitative and qualitative research methods, statistical analyses of such network data and benefits that follow from the application in marketing, mainly in the field of market segmentation.

Clustering Personal Networks as Symbolic Objects

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Personal or ego-centered networks are frequently encountered in the social science research. A unit of the analysis is a respondent (ego) with his/her personal network (alters). Each unit is described by selected variables, which are usually measured in different scales. Several (other) variables are also measured on alters, that describe relationship among ego and alters and properties of alters. Personal networks can be very large. In the paper we focus on two problems:

- Presentation or description of a personal network.
- Reduction of a personal network's size.

For the descriptions of personal networks symbolic objects are used. Using variable's distributions (instead of the value of an appropriate statistics - e.g. mean value used in the "standard" approach), the symbolic objects provide a more detailed description of personal networks. Based on this descriptions the adapted version of the leaders method was developed, which is a variant of the dynamic clustering method. The results of the proposed approach will be presented on the social support networks in Ljubljana 2000 data set, collected at the Faculty of social sciences of University of Ljubljana.

Towards Multilayer Network and Combinatorial Models

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We examine multilayer network, multilayer cellular automata, and their combinations. Applications are oriented to complex composite systems (social networks, organizational systems, sociotechnical systems, etc.). Multilayer network consists of the following: (1) basic elements for each layer: a set of elements (persons/individuals, tasks, groups/teams, rules, rights, rooms, goods, etc.) and some structures on them (binary relations, hierarchy, etc. as horizontal correspondence); (2) binary relations between structures of different layers (vertical correspondence). k-layer cellular automata is the following: (a) a set of elements at each layer; (b) each element has several types of basic states and four kinds of influences (logical or probabilistic functions, optimization models) as follows: self-influence, neighbour influence, influence of the higher layer, and influence of the lower layer; (c) layers can be composite ones. The following combinatorial problems are considered: (i) assignment/allocation; (ii) clustering (e.g., grouping, skeleton clustering); (iii) routing; (iv) approximation/covering; and (v) multiple matching. A list of applied examples involves the following: (a) allocation of personnel; (b) allocation of information access and/or decision making functions into a set of specialists; etc.

Visualization of Social Networks using SVG

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SVG (Scalable Vector Graphics) is a language for describing two-dimensional vector graphics based on XML (eXtensible Markup Language). Three different types of graphic objects are supported: paths consisting of straight lines and curves, images and text. SVG provides all transformations which are usual in standard vector graphics packages. Additionally, animation can be applied to SVG pictures. Pictures in SVG can be examined using Web browsers using a special plug-in. Objects in SVG DOM (Document Object Model) can be accessed using JavaScript language and in this way parts of the picture can be manipulated dynamically from the Web browser. In the paper some approaches to visualization of social networks implemented in Pajek as options for exporting layouts to SVG will be discussed and illustrated by some typical examples.

Patterns of Institutional Affiliations of Household Members and Children's Social Contacts

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The aim of this paper is to analyse the impact of properties of the local household environment on structural aspects of children's social relations. The structure of social relations of children is described by some aspects like the relative amount of social relations at different locations (home, street, school, sport clubs), multiplexity of contacts (same persons at different locations), more or less restricted size of social circles (number of persons met simultaneously), and so on which seem to be important for socialisation processes under a theoretical perspective. On this basis children are clustered into a few classes. Afterwards these classes are partly reconstructed by means of patterns of relations of other (mainly older) members of the households.

The empirical data were generated in 40 systematically selected small areas ("extreme cases") with 3000 to 15000 inhabitants each. Within each regional unit, a random sample of about 25 children age 8-9 and 13-14 was drawn. The children and one parent were interviewed, mainly about their personal relations and the institutions they were affiliated with.

Cognitive Networks

Stephen Borgatti

Formal Requirements for Using Network Metrics in Representing Cognitive Structures

Walter Bien
DJI

The representation of a network with paths build by a combination of links with an additive metric needs some formal requirements on the used data. Such requirements are e.g. that data are reflexive, symmetric, transitive, complete and for some content reasons balanced. We proved this requirements for cognitive representations of different relations between persons acting in small groups. The result show highly structured data in relation to the proved requirements, but also an extremely high number of violations against the requirements.

Some Issues in Comparing Aggregate Cognitive Networks

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Given a set of cognitive networks such as collected by Krackhardt or Kumbasar, a natural analysis to attempt is a comparison of the aggregate networks obtained from two groups of respondents, such as men and women. A typical approach to this problem uses the non-parametric, permutation-based QAP technique to correlate the two aggregate sociomatrices. However, the null distribution that QAP is based on may not be appropriate for comparing subsamples of a dataset. QAP compares the correlations between subsamples with correlations among a set of matrices that include many that are quite different from those could be obtained by aggregating subsamples. Consequently, the QAP approach reaches significance too often in this context. An alternative method is proposed here that compares the observed correlation with correlations among matrices that are of the same kind as the observed - they are obtained by aggregating data from random samples of the dataset. The new method yields results that accord better with researchers' intuition. In addition, the new method can be applied to a variety of data types beyond those appropriate for QAP.

Dreadful Ties: The Structure and Perception of Negative Interpersonal Networks

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Social network researchers tend to focus on the positive side of interpersonal relationships (e.g., friendship, advice, and trust). Negative relationships are acknowledged at times, but rarely measured because study participants are reluctant to answer questions about the disagreeable or malevolent side of their social lives. For this reason, we know little of how networks of positive and negative relationships differ in their structure, if at all. Nor can we say how transparent, or concealed, this structure is to the observer's eye. This study uses cognitive social structure data on the patterns of like and dislike among 53 students at an American university to demonstrate asymmetries between the way positive and negative relationships are built and perceived. Implications for the significance of positive and negative affect in the study of social networks are drawn.

Cognitive and Social Systems as Complex Interactive Networks

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 Sci.

Real world systems in many cases can be represented by networks. Networks can be seen everywhere (neural networks of the brain, food webs and ecosystems, electric power networks, system of social connections, global financial network, the world-wide web). Since the famous social psychological experiment of Stanley Milgram, it is known that from certain point of view we live in a 'small world'. However, the relationships between the structure of large networks and their dynamical properties generally are not well known. The performance of many biological, ecological, economical, sociological, communication and other networks can be illuminated by using new approaches coming from graph theory, statistical physics and nonlinear dynamics. The relationship between the topological structures of neural and mental structures are explained. Further examples will be given to illustrate the power of the new approaches in the understanding of the organization of cognitive and social structures.

An Argumentative Approach to Discourse: "Topos", Discursive Structures and Social Network Analysis

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This paper pays special attention on methodological and analytic issues related to argumentation and discourse, and on Social Network Analysis as a way for its study. From a theoretical point of view, argumentation is an area of inquiry which can be approached from a variety of perspectives and techniques. Anscombe and Ducrot (*L'argumentation dans la langue*, 1983) define an argument as a relation between a premiss "p" and a conclusion "c", relation which can be standardized in a linguistic-cognitive rule called "topos". From this point of view, an analytic proposal is developed. The procedure is based on the successive identification of argumentative relations in the text. As a result, discourses are not segmented into preestablished themes or categories, but globally represented in networks of "topos" which keep its unity. These cognitive networks are analyzed and represented by social network analysis.

Attempting to Analyse Biased Samples of Subjective Views

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In a social group each member of the Group may have a view of any other member of the group. This view may be expressed by a value on an appropriate scale which may depend on the "true underlying measures" of both the viewed and viewer. The way in which the view-value and the true-value differ will depend on how the viewer responds to the relative and absolute perceived positions of ego and other. Some actors will be "attractors" in that they give other actors a view-score closer to their own perceived score.

Data may be collected on the views of a sample (possibly 100%) of the individuals in the group. The first question to be considered is the estimation of the "true-measure parameters", for different sample structures and for different models of behaviour structure in the group.

It is then possible to consider asking a particular actor (their second order view of) how they would expect the other actors to view each other. Does this second order view contain new information which may be used to improve the efficiency in the estimation of the group parameters? If so then it may be possible to select just a few strategically placed (i.e. biased) viewers for first and second order view measurement in order to characterise the underlying parameters of group members, as well as their attitudes. Simple models and fitting algorithms for this "relativistic" model of group attitudinal structure will be presented on test datasets.

*The Dienes-Phenomenon:
A Cognitive Switchboard between Inter-scholarly Networks*

Joseph Perczel
International Council of Psychologists Inc.

The Dienes phenomenon (DPH) has been described the first time at the Second International Conference on Work Values (Prague, 1992, Proceedings, Pp. 35-42), as a radical, innovative approach to the interpretation of experimental data. The application of the method turned out to become an able instrument of interdisciplinary transformations, a Gestalt-switchboard using cognitive network operations - so to say. The basic innovation of DPH is the point that the way of presentation of data already determines their immanent disciplinary character and changes in presentations are operating switches between scholarly networks. Accordingly data have two different relations among themselves: permanent identities, differences (différence, külön-bség) and potential ones (différance, külömb-ség) varying according to disciplinary lines.

Knowledge Graphs and Network Text Analysis

Roel Popping
Groningen University

Sociological knowledge is available at many different places. It is desirable that empirically tested knowledge is available at one place. The many studies containing this knowledge contribute a little to theorising in a specific field, but do not hold a complete overview. Network structures can be used to get such a complete overview. Networks used for this representation are called knowledge graphs. This paper presents the state of art with respect to this kind of graphs and next concentrates on two issues. The first one is the determination of concepts (points) to be used in the graphs. Usually they are too broad; they are abstract concepts build up of several other concepts. The other issue concerns the use of conditional statements. Some findings hold only for a specific group, say only boys or girls. This has implications for the representation of the theory. The examples that are used come from the labour market theory.

A Proposal of Three-dimensional Coding of Texts Using Cognitive Networks: An Application to Narrative Interviews

Joan Miquel Verd
Universitat Autònoma de Barcelona

Nowadays cognitive networks are applied to very different fields. Besides the uses in Linguistics, Psychology or Artificial Intelligence as a system of knowledge representation it is possible to use them as a valuable help in qualitative text analysis. This paper presents an analysis procedure that combines cognitive networks and causal networks in order to obtain an objective, explicit and formalized structure of discourse. The objective is to reconstruct the discourse of individuals by attaching codes to segments of text and connecting them. This structure develops in two different planes. In the first one, a hierarchical relation between codes is established, going from codes with a high level of abstraction to those with a lower level of abstraction. This procedure is applied to semi-structured interviews in which the relation between training and employment is posed. The representation of the networks by means of graphs and the simplification based on the hierarchies of concepts prove to be very useful in understanding and explaining the training and labour trajectories described by individuals, as well as to compare the description of different trajectories.

Structures of Managerial Decisions in Export Strategy

Formulation - Cognitive Maps of Austrian Managers

Gerhard A. Wuehrer and Markus Kathan
Johannes Kepler University

Introduction. Since the Uppsala and Innovation models were developed, numerous scholars have advanced various criticisms. Some have said the models are too deterministic. It is likely that many firms rely instead on careful strategy making, which considers a number of more or less abstract success factors. By using these factors the decision to go international may be carefully mapped out in a planning process. Thus more emphasis should be given to the causal maps managers develop.

Methodological Foundations of the Study. The basic elements of cognitive maps are elicited concepts and their relations. Research, which applies cognitive mapping, utilizes a number of distinct elicitation methods. Critical design issues of mapping procedures have to cover saliency, comparability, validity, and atomism vs. holism, reliability, and practicability.

Sampling and analysis. The sampling procedure consists of a two step process. The students (n=162) of three university post-experience marketing courses for managers in export and international marketing took part. A standardized elicitation process did the elicitation to every student. In a second step general information on the respondent's firm has been collected. The structural analysis of the cognitive maps is carried out by the means of network analysis for managerial decision making. Theoretical as well as practical conclusions are drawn from the results.

Corporate and Inter-organizational Networks

Balazs Vedres

*Comparing Systems of Interlocking Directorates:
Accounting for the Duality of Inter-Organizational
and Inter-Personal Networks*

Malcolm Alexander
Netherlands Institute of Advanced Study

This paper argues that data on interlocking directorates must be carefully interpreted to account for the interdependence of the 'dual' networks of inter-organizational and interpersonal linkages. Inter-organizational linkages involve executive officer ties and multiplicity is an important aspect of them. These same multiplicities need to be eliminated from the interpersonal network in order to distinguish among big linkers and network specialists. The paper shows how these considerations impact on historical comparisons of same country (Australian) networks in 1976 and 1996 and cross-national comparisons of Australian and Canadian data.

Social Networks and Organizational Violence

Chantal Arousseau and Johanne Saint-Charles
Universite' du Que'bec a Montre'al

The authors suggest an inter-influence between emergent social network and the appearance or development of violence dynamics in the workplace. This hypothesis is supported by common elements between the two concepts, for instance: power, work processes, decisional flows, sense of belonging and other psychosociological dynamics. They believe that a better understanding of social networks could be a valuable predictor of organizational violence therefore leading to appropriate action in order to prevent or eradicate violence in the workplace.

In this paper, the authors merge their knowledge of both phenomena in order to create a theoretical framework supporting research avenues which they intend to pursue.

Amongst the questions addressed in this paper, are the following:

How do friendship and support networks in organization influence dynamics of violence? How does actor's position in the networks relate to their role in the dynamics of violence? How does actor's position in the networks relate to the degree of suffering or resistance to aggression? How does the network structure help to predict the potential sources for the denunciation of violence? How does violence affect the structure and composition of networks?

*Networks and Entry into Self-employment
First results of a survey among Dutch business
starters*

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University Maastricht, Business Investment Research
Center

The paper investigates the question: why do people become self-employed? The general argument is that entry into self-employment is determined by the utilization of different forms of capital, which are required to start a business successfully. Earlier research also suggests that the self-employment decision is also strongly influenced by a person's social background and environment. The social environment provides social capital, e.g. access to information and financial capital, which might increase the chances of a successful business start. Thus, entry into self-employment also depends on the network a person has and the resources the person can acquire from the network.

*Elite Sponsorship, Competition, and the Construction
of Quality in the Italian Wine Industry*

Raffaele Corrado, Vincenza Odorici, Alessandro Lomi
University of Bologna

The starting point of this work is the observation that the working of markets is affected by actors who are not directly involved in production or consumption decisions, but compete for the right to influence such decisions by establishing the structural conditions that are then taken for granted by buyers and sellers. We focus on the strategic interaction between these intermediary actors, out of which the market interface between production and consumption emerges. The empirical context for our work is the Italian wine market, characterized by the growing importance of publications that (i) assess the quality of wines; (ii) affect the distribution of prestige among producers, and (iii) shape the perception and behavior of potential consumers. This study is based on information about the Italian wineries and wines listed in several issues of two guides: "I vini di Veronelli" and "Vini d'Italia" published by the Gambero Rosso and the Slow Food Association. These two guides are very influential, widely read and considered to be in direct competition.

Our basic hypothesis is that the product evaluation policies of different publications reflect more strategic differentiation among competing elite sponsors, than actual differences in product quality. As a consequence, we expect these publications to show systematic divergences in spite of their shared commitment to the objective assessment of products' quality. In particular, we expect divergence to be more accentuated in the selection of the products for evaluation than in the rating of the same products. Similarly, we expect divergence to be less pronounced both in selection and rating, for wines associated with the names of prominent producers, denominations of origin, or regions whose prestige is already historically established and internationally recognized.

In order to evaluate these hypotheses we measure the divergence of the two guides in selecting wines for evaluation by building a relative index based on the number of wines selected by both guides and of those selected by only one of them, for each region or denomination of origin. We

expect this index to be lower for wines that belong to prominent regions or denominations of origin, where prominence of regions and denominations of origin is measured by their relative weight in terms of the wines cited in the guides. We also build a matrix of absolute differences (or pseudo-networks) whose elements represent the extent to which guides diverge in evaluating quality differences among pairs of wines. We expect this measure of divergence to be lower for wines that (i) share a prominent denomination of origin, or (ii) belong to a prominent region, or (iii) come from producers whose prominence is high, as measured by their centrality in the dual network induced by the sharing of winemakers.

Determinants of Stock Buy-Back in Large Swedish Firms

Christofer Edling and Rickard Sandell
Stockholm University

Due to an alteration in an Act in March 2000, public companies in Sweden gained the opportunity to buy back a certain share of their own stock. The paper investigates the determinants of stock-buy back programs issued in firms listed on the Stockholm stock exchange. Drawing on a theory of social influence, we suggest that the decision to buy back stock depends both on a firm's social embeddedness with other firms (indicated by interlocking directorates) and their potential economic benefit from the buy-back.

Inter-organisational Networks in Russia

Nina Gorovaia
University of Economics and Business Administration in Vienna, Institute for Urban and Regional Studies

A lot of empirical and theoretical works dealt with Western and Asian inter-organisational networks. This presentation focuses on Russian distribution networks and aims at identifying their special characteristics in order to find out assumed differences to Western and Asian networks. First, a classification of different network characteristics described in theoretical and empirical literature is developed. Then, on the basis of the empirical case study, characteristics of a Russian network are investigated. Special attention is devoted to the evolution of the network from 1992 until 2000. Effectiveness of the network is discussed from the point of view of the focal company. The focal company was responsible for the formation of the network and designed it to fulfil its distribution objectives. The paper shows how the structure of the network changed during the period from 1992 to 2000 following the changes in the competitive situation, market conjuncture and focal company's objectives.

Relations between Organizations and Personal Networks:

a Case Study on the Genesis of Cooperations between Firms and Research Laboratories in France

Michel Grossetti
Universite de Toulouse le Mirail

The question of what part personal networks take in the interorganisational relations is specifically central and difficult in the study of cooperations between research laboratories and firms, because these cooperations involve various kinds of agents. What are the agents really interacting (individuals, small teams, organizations)? How far inter-organisational relations are embedded in personal relations ?

The paper will address these questions on the basis of the results of an empirical study of cooperations between firms and CNRS laboratories in the field of engineering. We have reconstructed 130 stories of cooperations (with a contract at one time, but not necessary during all of the story), involving 27 scientific leaders, 19 laboratories and 81 industrial partners (firms or inter-professionnal organizations).

The analysis of the cooperations genesis show that there are three great kinds of meeting between laboratories and firms : networks (when there is a chain of personal ties between scientists and firm managers before the cooperation), markets (one of the partner meets the other on the basis of public information) and institutions (government agencies get the future partners together in a co-operative group). We will discuss these various kinds of meeting using the notions of embeddedness (Polanyi, Granovetter, White), and decoupling (White).

Influence of Inter-Organizational Network Structures on the Success of a First Mover Strategy

Anna-Martina Kroell
University of St. Gallen

Entering into a new market is one of the key challenges especially in the New Economy. With regard to the different market dimensions, this paper focuses on the dimensions function and form according to Abell's definition. While the theoretical discussion about First Mover Advantage or disadvantage is still ongoing, the paper takes the view that each entry time strategy follows a different reasoning but that no strategy is per se superior to others. The success of a market entry strategy depends on a number of specific boundary conditions relevant to the chosen strategy. This paper considers the first mover strategy with its advantages like experience-curve effects, market entry barriers, longer pay-off periods, and customer binding and its disadvantages like huge R&D costs, market uncertainties and free-riding by competitors. It is based on the assumption that specific network structures have major influences on these advantages and disadvantages and in the paper it will be discussed how structural concepts like density, hierarchy or structural holes or relational concepts like range, relationship content, -form, and intensity might influence the success of a first mover strategy.

Social Capital and the Australian Corporate Experience

Gavin Nicholson
University of Queensland
Malcolm Alexander
Griffith University

As scholars attempt to come to terms with the importance of social context to business, social capital is a construct receiving increasing attention. However, within the Australian context social capital is a relatively unexplored area of research. As such, studies have tended to concentrate on the role of corporate interlocks as links between organizations. The objective of this research is to broaden our understanding of the network of corporate power in Australia by examining two specific extensions of this research. We present findings on the relationships between organizations and the individual directors (rather than organisations) as well as findings on the linkage patterns of the resource quantum of the network of top 500 listed corporations in Australia.

Analysis of Ownership and Supervisory Board Relations in Slovenian Companies

Marko Pahor, Anuška Ferligoj, and Janez Prašnikar
University of Ljubljana

As a result of privatization, Slovenian companies are mostly publicly-owned corporations. As follows from the privatization model that was applied, at the beginning companies' stocks

were mostly owned by the state and private investment funds and individuals. After trading in these stocks began, other companies became involved as owners. However, our main hypothesis is that the network structure of ownership relations among Slovenian companies is today still influenced by the privatization model. On the other hand, Supervisory Boards do not reflect the ownership structure of companies as they should. There are several other factors that determine their structure.

We examined a sample of 150 Slovenian companies. Most of them are companies that are quoted on the Ljubljana Stock Exchange, while some other companies are considered which are important within the Slovenian economy yet for different reasons are (still) not quoted, and certain financial institutions (e.g. banks and investment funds).

We looked at two kinds of ties between any two companies, the ownership relation and the controlling relation, defined by the presence of representatives in companies supervisory boards.

Several network analysis approaches will be used in analyzing the network obtained. Relations are analyzed separately and then compared.

The study is of special importance, because it compares the ownership and the control relation in Slovenia, a transitional economy. The results will be compared with similar studies of corporate networks in traditional and transitional economies.

*Personal relations in an organizational context.
Integrating network approach with ethometodology
and symbolic interactionism*

Lelio Prandi
Università di Genova

This paper sets out to show the usefulness to integrate the network approach with ethometodology and symbolic interactionism for the purpose of studying interpersonal relations in an organizational context. The network approach has been used to shed light on the following questions:

- a) A comparison between the formal organizational design and the observed relations, as emerging from the day by day on-the-job interactions, with particular respect to those predicted but actually ignored. This is a methodological question that may contribute to network theory in that a substantial difference between the formal and the observed relations may conduce to a specific shape of the network structure;
- b) How employees manage to cope with a lack of information and resources through informal relationship. This is a theoretical question that may contribute to clarify how the lack of information and resources shapes the network structure;
- c) What are the consequences for network structure of the mismatching between the formal and the actual network, with respect to potential conflicting organizational goals. This is also a theoretical question.

In order to answer all such questions, information has been drawn from a former study concerning the organizational culture of a financial corporation. An analysis of the development and consolidation of its organizational context has been instrumental to obtain and elaborate this information.

*Interorganisational Networks in UK Construction:
Shifting Centrality and Learned Client Organisations*

Stephen D Pryke
University College London

This piece of research is based upon the premise that the construction project team, or temporary coalition, that commissions, designs and constructs a building, might be

regarded as a network of firms providing specific, and contractually defined roles. The research has looked at five case studies, three of which represent the cutting edge of procurement strategy in UK construction. The analysis focuses upon the density of the contract, communication and financial incentive relationships between the actors or role providers and the centrality of the main actors within financial and progress monitoring, as well as design communication networks. The research is intended to establish the use of social network analysis for the evaluation of emerging reforms in UK construction procurement and provides an analysis of innovative procurement strategies involving partnering, supply chain management and technology clusters. We look at the very different systems of roles and relationships adopted by the largest public sector procurement agency (Ministry of Defence) and one of the largest private sector developers in the UK.

*Bringing the Task back in: a Network Investigation
on the Contingent Value of Resource
Complementarity in Partner Selection and Alliance
Formation*

Giuseppe Soda, Vincenzo Perrons, and Alessandro Usai
Bocconi University of Milan

It has been argued that organizations create cooperative ties with other organizations in order to satisfy their resource needs. By pooling resources with other companies, firms can complement each other's weaknesses, since each partner in an alliance can access the complementary resources and capabilities of the others. Consequently, the concept of resource complementarity lays at the core of the alliance formation process, addressing both the determinants of alliances and the rationality of partner selection (Gulati and Gargiulo, 1999).

However, we argue that there is a lack in the complementarity argument traditionally adopted in alliance studies. Indeed, the research question of "with whom do firm ally?" has rarely been conceptualized and consequently analyzed combining firms' resource profiles and task requirements. The aim of this paper is to try to cover up this gap through an empirical research comparing the resources required for complex tasks and the resources and capabilities possessed by firms. We argue that in defining and using complementarity as a predictor of partner selection, two main additional concepts have to be taken into account: the task and the asymmetry in the possession of complementary resources. In order to test our propositions, we analyzed 120 Italian construction projects, worth a total value of 3750 millions Euro and involving 100 general contractors companies. Using Social Network Analysis methods, we developed a procedure for measuring task resource complementarity and its asymmetric components. Using QAP Multiple Regression analysis we then compared the task and asymmetry measures of resource complementarity with the traditional measures of niche overlap as determinants of alliances. The results strongly support the hypothesis that in order to understand alliance formation we need to take into account the task and the asymmetry in the possession of complementary resources.

*Transforming Corporate Networks in Hungary in the
90's*

Balazs Vedres and David Stark
Columbia University

Using comprehensive datasets from 1990 to 1999, we analyze changes in the ownership and interlock networks of the top 500 Hungarian companies. One of the main arguments of the paper is that the post-socialist economic transformation that seems monotonic from an atomistic, firm-centered viewpoint (with the socialist enterprise at the beginning that transforms into a capitalistic enterprise) is not monotonous from a network approach. The structural story of economic transformation can be presented in three

stages. The first is the breakup of socialist firms with few interorganizational ties. The second phase can be characterized by dense interorganizational networks with cohesive subgroups. The third phase is a new atomization characterized by the dominance of multinational capital. The presence of a foreign non-financial company as a majority owner leads to the breakup of interorganizational ties around the owned company. Our analysis of the ownership and interlock networks uses dynamic network visualization techniques along with network models of the phases. We detect cohesive regions in the networks and model the existence or non-existence of the ties between firms. In addition to ownership and interlock ties the effects of geographical location and branch of industry are also analyzed.

Complementary and Alternative Medicine on the Road to Professionalization: The Role of Diverse Social Networks

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As larger numbers of people in North America use complementary and alternative medicine (CAM), there has been a corresponding growth in the number and types of CAM practitioners, many of whom are striving to achieve self-regulation and professional recognition. Social networks have the potential to explain why some attempts at professionalization succeed better than others. Our research is based on recent interviews in Ontario, Canada with leaders of a variety of complementary and alternative health care fields: chiropractors, traditional Chinese medicine doctors/acupuncturists, naturopaths, homeopaths and Reiki practitioners. We find that the more developed, diverse and extensive the networks, the closer to self-regulation and professional recognition. For example, chiropractors, the most organized and mainstream of the CAM occupations clearly have strong intra-organizational links with other chiropractic associations as well as many interorganizational links to other health care associations, business associations and governmental agencies. They are a self-regulated profession. By comparison, the networks of homeopaths are less extensive, diverse, and cohesive. They are not self-regulating. We conclude that networks are a two way street. Not only do diverse, extensive networks bring to organizations information needed for the professionalization process, networks also help to position organizations in their quest for self-regulation and professional status.

Data Mining

Paolo Giudici

An attempt to network analyse life story interviews (the network of remembrances)

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Sociological Institute of the Academy of Sciences, Budapest
Zsuzsanna Korosi
Oral History Archive

In a 3-year research we are attempting to analyse the network of remembrances by combining and merging qualitative oral history data with quantitative network-based sociological methodology. Our "raw" data are life story interviews of the participants and victims of the 1956 Hungarian Revolution. The interviews primarily focus on the time of the revolution and its consequences. In this paper besides giving the results of our pilot study - based on 21 interviews - , we would like to show the steps of data collection, coding and analysing.

On a Web Usage Mining technique to extract knowledge for Web personalization

Gabriella Schoier
University of Trieste

A natural combination of two active areas of research i.e.: Data Mining and the World Wide Web (WWW) referred to as Web Mining. The term Web Mining has been used in two distinct ways: Web Content Mining and Web Usage Mining. The former describes the process of information from millions of sources across the WWW while the latter is the process of mining the Web access logs on one or more Web localities. Recently Web personalization based on Web Usage Mining has been developed. To extract knowledge, for the purpose of Web personalization, different Web Usage Mining techniques such as transaction clustering, usage clustering and association rules are used. We have considered a technique for preprocessing of Web usage logs and grouping URL references into sets (user transactions) and have apply it to a real data set.

Network analysis of 2-mode data in Pajek

M. Zaversnik and V. Batagelj
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Often we have to analyze 2-mode data where we have a data matrix A (bipartite network) over two sets U (rows) and W (columns). Some examples: (persons, events), (customers, products), (papers, cited authors), ... One or both sets can be (very) large. We can analyze such data matrix directly or transform it into 1-mode matrix (network) over U or W. Pajek supports both types of networks. In the paper we shall present several options available in Pajek for analysis of 2-mode data and illustrate them on real life examples.

Developments in Network Methods in the 1990's

Peter J. Carrington , John Scott, Stan Wasserman

Positional Analyses of Sociometric Data

Patrick Doreian
University of Pittsburgh
Vladimir Bategelj and Anuska Ferligoj
University of Ljubljana

This paper provides an introduction to generalized blockmodeling. It starts with the definition of the location of an actor in a set of social relations. It then defines a position in a social network(s) as a cluster of social actors that have been grouped in accordance with some structural characteristic(s) that include locations. These positions are used to define and construct a set of blocks that are assembled into a blockmodel. The blocks are summaries of the ties between positions and within positions. The chapter then presents a series of ideal blocks: null, complete, regular, row-regular, column-regular, row-dominant, column-dominant, row-functional, column-functional, symmetric and triangular. Structural equivalence is shown as a special case where only null and complete blocks can be in an ideal blockmodel. Regular equivalence is another special case where only null and regular blocks are permitted in an ideal blockmodel. Clique structures, ranked-clusters, center-periphery and dominance hierarchies can all be defined in terms of permitted blocks. We discuss general methods for fitting blockmodels to data and illustrate them with examples of children's networks, inter-organizational networks, animal grooming and dominance relations, and a variety of other small groups. Methods for displaying block models are discussed also.

Analysis of Longitudinal Social Network Data

Tom A.B. Snijders

University of Groningen, The Netherlands

A review is given of statistical models for longitudinal network data. It is argued that continuous-time models are more appropriate for modeling such data than discrete-time models. The stochastic actor-oriented approach is presented, in which the network evolution is modeled as the consequence of the actors making new choices, or withdrawing existing choices, on the basis of functions, with fixed and random components, that the actors try to maximize. The change in the network is modeled as the stochastic result of network effects (reciprocity, transitivity, etc.) and effects of covariates. The existing network structure is a dynamic constraint for the evolution of the structure itself. These models are continuous-time Markov chain models which can be implemented as simulation models. The model parameters can be estimated from observed data using a Markov Chain Monte Carlo method. This presentation focuses on how this approach can be applied in practice, using the SIENA program. Some examples are given of modeling data sets with 2 to 5 repeated observations of the network.

Models and Methods for Innovation Diffusion

Thomas W. Valente
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This chapter reviews research on models and methods used to understand how new ideas and behaviors spread through social networks. The chapter describes social influence models from a network perspective and presents a substantive diffusion network model. Applications of this model in a variety of settings ranging from adolescent schoolbased studies to international community settings are reviewed. The chapter discusses statistical issues that arise in the estimation of network influences on behavioral adoption. Specifically, I address uses of HuberWhite estimators for egocentric dyadic data and issues of nonindependence for census data. As models and methods for studying network influences on adoption and diffusion dynamics are more clearly specified, they will provide fertile techniques for expanding network theory.

*An Introduction to Random Graphs, Dependence Graphs, and p^**

Stanley Wasserman
University of Illinois
Garry Robins
University of Melbourne

Statistical models and distribution theory for graphs, with applications to social networks, have been used by social and behavioral scientists for over sixty years. In this chapter, we review these approaches, and show how recent distributions, such as p^* , subsume much of the earlier research. We describe the very general notion of a dependence graph, show how it can be used to model dependencies among network relational ties, and how it gives rise to p^* . Estimation of p^* model parameters and general model fitting concerns will be discussed.

Diffusion of Innovations

Thomas W. Valente

Cumulative Behavioral Performance as a Social Influence Network Process

Eugene C. Johnson and Noah E. Friedkin
University of California, Santa Barbara

We present here an approach to estimating or determining the networks of social influences underlying the cumulative

performance of a particular observable behavior over time in a fixed group, e.g., the cumulative adoption of a particular innovation over time in the group. It turns out that such processes are readily described by extended special cases of the Friedkin-Johnsen (F-J) model of social influence (Advances in Group Processes, Vol.16,1999, JAI Press, 1-29) where the resulting inferred matrix or matrices of social influence exactly generate the time sequence of behavioral performance originally observed, thus showing that the extended F-J model can accommodate behavioral as well as attitudinal processes. We examine examples of such cumulative behavior to show how the extended F-J model can be used to describe and elucidate the workings of such processes. These examples include some of the data collected by Coleman, Katz and Menzel in their study of the cumulative adoption of an antibiotic by physicians in four U.S. Midwestern towns.

Innovation within Networks: Policy Implications for Regional Planners

Dimitrios C Christopoulos
University of the West of England-Bristol

How can policy makers stimulate innovation? In order to give a satisfactory answer to such a fundamental question of industrial and regional policy I have looked at the factors that impact on the dissemination of innovations evident in a recent study of SMEs in the South West of England. The relevance of concepts such as the 'innovative milieu' and the 'learning trajectory' provide the theoretical background. An attempt is made here to determine the efficacy of employing a network perspective in analysing the dissemination pattern of innovation. Recent theoretical and empirical investigations suggest that the regional social context and regional governance structures are directly related to regional growth. Case study findings suggest that central actors in internal innovation networks are mainly senior managers and engineers who act as 'brokers' of innovative practice. This might be related to the strong commercial dynamic behind most incremental innovations that characterise firms in the sector examined. Also identified is a particular kind of actor termed here an 'innovation entrepreneur' and a number of policy suggestions are ventured that could facilitate those actors effective networking. In the conclusions a number of concrete suggestions are made that relate to policy makers ability to effect the dissemination of innovative practice in a region.

Does friendship matter? How friendship communication and friendship rela- tions impact innovation team performance

Jan Kratzer
Groningen University

Sometimes it seems as if product development is one of those areas in which pure luck seems to be the best explanation for success. But that is not the case as research widely confirms. Innovation teams that are properly managed outperform innovation teams that are not. To manage innovation teams, however, requires managerial knowledge about relational processes and their effect on performance. One of the major issues for managers is 'does friendship among team members facilitate project progress or not?'. However, friendship is a multifaceted and ill-defined concept in research and real life.

Managers, for example, might use the term for intimate friends and for the people we meet on the job with whom one has what should be more appropriately termed 'friendly relations'. According to the two-fold usage of the term friendship, a distinction is made between friendly communication and friendship relations. Moreover, there are plenty contradicting views in theory, for instance the 'cohesion-compliance hypothesis' and the 'weakness of strong ties-hypothesis', that disallow to give any helpful advice to managers. This study examined these contradictions in innovation teams by relating

structures of friendly communication and friendship relations to their performance.

*The Politics of ISO 9000:
How Thinking and Doing are Separated*

Andrew Schenkel
Stockholm School of Economics

Since 1986 the number of ISO 9000 certified organizations has grown to over 250,000. ISO is increasingly becoming one of the dominant paradigms of quality management. The implementation of ISO, can be assumed to impact directly or indirectly on knowledge based activities. The purpose of this paper is to examine the relationship between ISO 9000 and knowledge creation, embeddedness and flows. The setting for this study is a major complex project utilizing an ISO 9000 based quality system. The specific research context examined in this paper is the management of ISO 9000 deviations or situations in which articulated procedures, processes are not followed or objectives not achieved. It was found that the emergent advice network in managing ISO 9000 deviations was significantly correlated with the formal network. This was surprising in light of the relatively high degree of industry experience of the work force and the similar nature of work conducted by the operative departments. These findings are analyzed and understood through Foucault's power/knowledge relationship and concept of discourse. This raises a number of questions about the potential role of ISO 9000 on project based organizations.

*Diffusion of Innovation in Rural Areas
Examples of a Hungarian and an Andean Quechua
village*

Laszlo Letenyey

Is technological innovation the killer of ancient society? Anthropological studies made in rural areas point out that diffusions have effects changes of social structures: the role of strong ties became less important and were replaced with market institutions. I would like to show that in some situations the diffusion of innovations can also reinforce the traditional social structures. The innovations will diffuse among the members of strongly tied communities (parents, good friends) and will re-integrate the old social structures.

Entrepreneurial Actors in Innovative Milieus

Gerhard A. Wuehrer and Petra Kuchinka
Johannes Kepler University

The rationale of the case study is to examine the ego-networks of innovating enterprises as actors in an innovative milieu. The ongoing project consists of different levels of analysis. Starting point is the importance of different areas of innovation for the dynamic of an enterprise. A written questionnaire was administered to 1489 randomly selected enterprises. The sample of n = 233 small and middle-sized enterprises is the basis for investigation. A factor analysis combined with a cluster analysis leads to four types of innovative firms. These innovative actors are of generic type. They are independent across size (measured by employees) and industry. They closely resemble the typology developed by Miles/Snow (1986) and Miller/Friesen (1982). Several hypothesis are tested regarding performance in innovative products, techniques for innovating, and support during innovation process. The type of data include attributes and relational information of innovating enterprises. So besides variable analysis, typological, and network analysis can be combined on a quantitative basis.

To investigate the supporting members of the network the milieu participants as seen by the actors are elicited. The milieu consists of consultants, chamber of commerce, trade associations, university institutes, research consultants, banks, R&D funding institutions, suppliers, and customers.

Final hypothesis testing will answer the questions whether density, and other measures of network structure of support networks vary across actor types or not. First research findings see a correlation between network structure and actor type.

Evolution of Social Networks

Phil Bonacich

*Joining up, Moving on: Change and Stability
in Repeated Small Group Formation*

Holly Arrow and Katie Burns
University of Oregon

Sets of strangers played multiple rounds of a social card game in which they formed groups repeatedly to make card hands and earn money. The structure of the game allowed for isolates to be left out of the two emergent small groups that formed each round. With co-membership in a group counted as a tie between members, we examined change and continuity across rounds to identify dynamic patterns. The developing network was perturbed in round six of the seven rounds of group formation by changing the reward structure.

Some networks had a single group configuration we could identify as an "attractor"; some had multiple attractors, and some sets of players formed a different configuration of groups in every round of the game. The variety of paths by which the networks developed appears to depend not on external conditions but on the initial conditions established by players in the first round of the game. Results are discussed in relation to complexity and chaos theory.

*Homogeneity of Attitudes towards Ethnic Minorities
within Ego-centric Social Networks*

Stephan Ganter
University of Mannheim

The paper will explore the homogeneity of attitudes towards ethnic minorities in Germany within social networks. So far, empirical research on opinions and attitudes towards ethnic minorities focuses mostly on individual attributes and characteristics. Purely "atomistic" models are, however, challenged by evidence from studies showing that such personal opinions and attitudes are strongly correlated with (perceived) opinions and attitudes of important reference groups and discussion partners. But it remains unclear whether these correlations are substantiated in processes of social influence occurring within networks of close associates who share common understandings. Are subjectively perceived opinions and attitudes of alteri simply the projection of respondents' own opinions and attitudes? Is there more homogeneity of attitudes towards ethnic minorities within dyads and social networks than across networks? In order to answer these questions I use recently collected data (N=380) including information on egos' opinions and attitudes towards ethnic minorities, on egos' perception of the opinions and attitudes of important alteri as well as on opinions and attitudes of the alteri themselves. Results reveal that the actual homogeneity of these attitudes is conditional on individual characteristics as well as on characteristics of dyads and (ego-centric) networks.

Evolution of Social Influence

Jun Kobayashi
University of Chicago

What social influence evolves when individuals change their opinions to reach a unanimous consensus? To answer this question, I model the process of imitating successful social influences in social networks. By using evolutionary game

theory, I derive the following results. (i) If an individual sympathizes with the lowest opinion, this social influence will remain behind as an evolutionarily stable strategy and will eventually be adopted by all individuals in the long run. (ii) In general, if an individual replaces her opinion with any specific person's opinion, this social influence will prevail among all individuals.

Prestige in Longitudinal Networks

Wouter de Nooy
Erasmus University Rotterdam,

Network analysts have developed several structural indices of social prestige. All of these measures focus on asymmetry in choices (choices received) within a social network at one point in time. This paper examines ways to measure prestige in (two mode) longitudinal networks which represent artistic careers. Inspired by Pierre Bourdieu's field theory and his notion of 'trajectories', several sociologists of culture have argued that the importance attached to positions as well as actors within a cultural field are interdependent and change over time. Assuming cultural importance to be a kind of social prestige, we define a simple dynamic measure of prestige based on "choices" received by cultural institutions in artists' careers, viz. authors' affiliations to literary magazines over time. We apply this measure to longitudinal data in order to inspect the stability of results and their validity. Also, we use Markov Chain Monte Carlo estimation implemented in SIENA software (T.A.B. Snijders, 2000) to test whether authors' transitions from one literary magazine to another are predicted by the prestige of magazines, which is measured either dynamically or statically.

Modeling Florentine Republicanism

John F. Padgett
Santa Fe Institute

The following model of political process is intended to be a moderately realistic representation of Florentine republicanism, during the period of the Renaissance (~1300-1500). The model is composed of two parts: (a) patronage-namely, the building up of partisan networks through the exchange of office-based favors, and (b) policy-namely, the collective deliberation and choice of "public goods" for Florence, in the Priorate (i.e., the city-council governing body). It was the tension and interplay between these two modes of governance, I contend, that produced Renaissance Florence's distinctively turbulent, and creative, history of party formation and constitutional design.

This memo proceeds in three sections: the official structure of the Florentine state, the patronage networks that grew up through these offices, and the "sacred" institutions at the center that may or may not have transcended patronage.

Using Network Analysis to Explore the Development of Training groups

Carmen Retter and Judith Schwarte
Justus-Liebig-University Giessen

This paper presents the investigation of training groups as evolving learn networks on the basis of three day training courses with students. Over this period the students had to answer three questionnaires. All three focus on attitudes towards learning and relational structures among the training members, in addition the first questionnaire entails for the demographic characterization of the students. Aim of the study is to identify influencing factors on the development of network structures. First results of the analysis reveal the following aspects: age and progress of study, the proportion of training members knowing each other prior to the course, as well as former experiences with such training courses.

Social Ethnic Segregation in Dutch High School Classes: Contact Versus Competition

Lotte Vermeil and Chris Baerveldt
Utrecht University

This study aims to clear up the effect of numerical ethnic composition of a school class on the probability that two class mates with different ethnic backgrounds develop a friendly relationship. Two arguments resulting in contradictory predictions can be made. On the one hand, the contact hypothesis predicts that the more people are exposed to members of other ethnic groups the more they will feel friendly towards them. The exposure opportunity between groups is highest between the members of two groups when they are of equal size, suggesting that the likelihood of an inter-ethnic friendship is highest in that situation.

On the other hand, social identity theory states that identity strategic motives serve inter-ethnic relationships. Ethnic groups in a school class might compete for social status and cultural space. If a minority group is very small (e.g. two persons) its members might choose the option of assimilation, but if a minority group reaches a substantial size and thereby substantial social power its members might choose competition. According to this argument competition is highest when groups are of equal size, resulting in a salient group identity and a low likelihood at inter-ethnic friendship.

The two possible effects are separated by including the intermediate variables 'knowledge about other cultures' and 'ethnic identity'. Dyadic analysis were conducted on survey data collected amongst 1450 pupils in 74 school classes in the Netherlands.

Network Evolution in the Canadian Investment Banking Industry (1952-1990)

Tim J. Rowley and Joel A.C. Baum
University of Toronto

The primary goal of our study is to build and test a model of interorganizational network evolution. The interorganizational literature suggests that tie formation is based on how firms are 'embedded' in their networks as information on the quality and reliability of potential partners comes from three sources: 1) an actor's own ties, 2) an actor's partners' ties, and 3) the status of other actors. Over time, relationships accumulate into a network that becomes a repository of such first- and second-hand information on prospective partners. In addition, we view actors as competing for interorganizational relationships endeavoring to improve their network positions (e.g., centrality/status), and compete on the basis of their current network positions.

We empirically examine network dynamics using longitudinal data from the investment banking industry in Canada (1952-1990). Syndicate relationships are formed among investment banks in order to successfully underwrite security offerings from firms attempting to raise capital. These data provide a means of studying network formation, reproduction, and evolution. Specifically, our analyses focus on the dynamics of actors' positions - the ascendance and decline of investment banks within status orders - as well as the subgroup structures within each network.

Structural Determinants of Leadership Roles in Mediated Networks

Michael Stefanone and Geri Gay
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This paper analyzes mediated communication patterns among university students. The constructs addressed in this paper pertain to roles manifest in email networks, conceptualized as social networks, and measures of influence in the form of 1) social network measures of centrality and prestige adapted to discussion board thread data and 2) actual measures of user behavior manifest via socially recom-

mended URLs. Data was collected during a comprehensive research initiative directed at investigating the effects of mobile, ubiquitous computing. The participants, students enrolled in a communication class, were issued laptop computers equipped with wireless modem cards, which remained in their sole possession for the duration of the semester. Participant email log files were collected for one semester at a large Northeastern University. A proxy server collected all of the URLs from sites students visited over the course of the semester, as well. Actors with central positions within the email (social) network are hypothesized to hold positions of leadership, or prestige, in a computer supported learning environment. The length of discussion threads and level of response to socially recommended URLs are the dependent variables measured. The reliability of the data affords a rare opportunity to assess the structure and effects of mediated communication networks.

Similarity and Beyond: Students' Friendship Networks in the Netherlands and in Japan

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University of Groningen
Hiroshi Hiramatsu
University of Kobe
Frans Wasseur
University of Groningen

In the formation of friendships, similarity seems to be an important, if not the most important, determinant. This has been found especially for 'visible' characteristics like gender, age, ethnicity, etc. In a study of two different student populations over time, we study whether beyond the visible similarity other, more 'invisible' characteristics like leisure activities and study orientation, can be identified that may give a more substantive interpretation to similarity. Although both populations are relatively closed groups of college students, many differences between Japan and the Netherlands are found. The p2 model and the SIENA model are used for the analysis.

Formation and Dissolution of Service Delivery Networks

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University of Western New Mexico
Patrick Doreian
University of Pittsburgh

The environment of an organization is the network(s) of organizations in which an organization is embedded. Many who examine inter-organizational networks assume that while executives have differential abilities to influence network structure and exert control over other actors located in the environment, most executives are constrained by the networks in which their organizations are located. In contrast, we argue that administrators or CEOs in the public sector have a large amount of discretion over participating with others in creating new programs and building service delivery networks. There are two dominant mechanisms for doing this. One is that while creating new forms of service delivery, administrators can spin off new programs that then become freestanding agencies or organizations within the community. The second mechanism is one where administrators to pull freestanding organizations within their own organization and thereby exert tighter control. Using data from three U.S. counties, we explore the processes of service delivery network formation and dissolution that include these mechanisms.

Infectious Diseases and Social Networks

Alden S. Klondahl

The Influence of Social Networks on the Perceived Risk of HIV/AIDS Infection and Protective Behavior

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Susan C. Watkins
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How do people alter their sexual behavior in the era of AIDS?

Individualistic models of behavioral change dominate the answer to this question. However, these models are increasingly enlarged by aspects of social networks that provide a person with opportunities for health-related communication and interpersonal influence. This paper explores the significance of social relationships to two central stages within the process of sexual behavioral change: the perceived risk to become HIV-infected by unprotected sexual intercourse and the willingness to protect oneself against infection either by sexual fidelity or by condom use. The empirical analyses rest on data from the 'Kenyan Diffusion and Ideational Change Project' (KDICP) that give information about AIDS-related, ego-centered communication networks of Kenyan men and women. The respondents' perceived risks as well as their intentions to protect themselves against HIV-infection depend heavily on the prevailing perceptions and favored protective methods within their personal communication networks. The risk-perceptions both of men and women are shaped by strong ties with relatives and friends. However, there are gender-specific relationships that lead to the willingness for protective behavior. Women tend to be influenced by strong ties whereas men report more often - especially in the case of condom use - on weak ties to distant acquaintances.

Outbreak Networks: Concepts, Examples and Implications

Alden S. Klondahl
Australian National University

The purpose here is to discuss the concept of an outbreak network, to indicate how (and why) it differs from other conceptualizations of networks, to provide some examples of actual outbreak networks, and to highlight a range of implications of this concept.

The Building up of Opinions on the Quality of Care in Local Discussion Network

Alexis Ferrand
CNRS CLERSE Universite' de Lille

Regulation of health systems implies controls on the quality of care. Apart of formal controls organized by professional associations or health organizations, patients, as clients, can play a role. But it needs that they evaluate and judge various dimensions of the quality of cares. And this is not simple for them due to the asymmetry of knowledge and legitimacy. We demonstrate that informal networks of discussion on health and cares exist often, not always and that they allows formation of opinion. An empirical research compares in two cities networks of discussion about health among people. Items about opinions on the quality of cares allow a description of references used by practitioners and by people to evaluate care. We examine the effects of belonging to various social milieus and to different local communities on the types of networks build and the types of opinions they convey. Doing so we propose new insights on the process by which quality of care is controlled by informal

networks.

The Process of Sex Partnership Formation and HIV Risk among Low Income Women who Use Drugs

Maureen Miller
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Alan Neaigus

National Development and Research Institutes, Inc.

Objectives: To explore the process of sex partnership formation in high HIV prevalence neighborhoods among low income women who use drugs and who are at risk of infection with HIV and other sexually transmitted pathogens.

Methods: As part of a pilot study, in-depth, qualitative interviews were conducted with 28 women who used drugs, recruited in New York City between March and November 2000. Central to the research was an assessment of factors that motivated and maintained sex partnerships.

Results: Participants were racially/ethnically diverse (29% black, 29% latina, 32% white, and 10% mixed race/ethnicity) and, on average, 30.5 years old. Most (79%) used heroin, crack (39%) or cocaine (21%); 61% had injected drugs. Sex work was the most commonly reported source of income (61%). However, the most common strategy for long term material support was the initiation and maintenance of sex partnerships. Sex partnership formation was influenced by women's immediate need for material support and the opportunity structure of available partners. Most women reported having partnerships with older male partners able to supply needed resources (i.e., drugs, food, shelter, protection). Women supplied sex in exchange for resources in these initially uniplex relationships. Many partnerships went beyond their basis in material support and became emotionally close, multiplex partnerships with strong ties of relatively long duration. Unprotected sex was frequently reported in multiplex relationships, with the exception of HIV serodiscordant relationships in which the woman was HIV infected. Sex risk within uniplex relationships also occurred, when women perceived that the provision of material support had reached a threshold that required unprotected sex in exchange.

Conclusions: Resource acquisition plays a significant role in the formation of sex partnerships for women who use drugs. Disassortative mixing patterns by age, high levels of sex partner concurrency due to women's participation in sex work and multiple partnerships, and the exchange of unprotected sex for material resources or mutual participation in unprotected sex resulting from the development of strong ties, all contribute to women's increased risk of acquiring, and also of transmitting, infection in their sex partnerships.

HCV Transmission Probability in HCV Discordant Partnerships among New Injectors

Alan Neaigus
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Maureen Miller
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Michele Persaud
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Objective: To determine the probability of hepatitis C virus (HCV) transmission in the injecting partnerships of new injecting drug users (IDUs).

Methods: Between February 1999 and September 2000, new IDUs (injecting for 6 years or less) in New York City between the ages of 18 and 30 were administered structured interviews and counseled and tested for HCV. They were asked whether, in the last 30 days, they had engaged in distributive equipment sharing (DES) (distributing injecting equipment that they had used first to their injecting network

members) or receptive equipment sharing (RES) (receiving injecting equipment used first by their injecting network members), and if their injecting network members were infected with HCV.

RESULTS: 124 reported injecting networks (76.5% of 162 interviewed and tested), 45 (36.3%) of whom were HCV seropositive (HCV+). Of 246 injecting partnerships reported, HCV+ index new IDUs reported 83 (33.7%) and HCV seronegative (HCV-) index new IDUs reported 163 (66.3%). Among HCV+ indexes, 67 (80.7%) reported that their partners were not known to be HCV infected and that DES occurred in 21 (31.3%) of these partnerships; the transmission probability was 25.3% of these partnerships. Among HCV- indexes, 21 (12.9%) reported that their partners were HCV infected and that RES occurred in 12 (57.1%) of these partnerships; the transmission probability was 7.4% of these partnerships. HCV transmission behavior occurred in 13.4% of all new IDU index HCV discordant partnerships (8.5% from HCV+ indexes and 4.9% to HCV- indexes). This estimate of the probability of HCV transmission is consistent with HCV seroconversion rates reported in the literature.

Conclusions: There is a high probability of HCV transmission among new IDUs and their injecting network members. The injecting partnership mixing pattern among HCV discordant new IDUs, as well as the high prevalence of HCV infection and of HCV transmission behaviors contribute to the alarming incidence of HCV among new IDUs.

Social Network Effects on the Transmission of Sexually Transmitted Diseases

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University of Chicago

This paper examines how social and sexual networks affect the risk of getting infected by sexually transmitted diseases (STDs). Social networks can affect the risk in two ways: via information or control. First, people get information about the risk of potential partners as well as cultural norms about normal or safe sex through social networks. Second, stakeholders, including primary sexual partners, kin or close friends, exert control on who are appropriate potential partners (and what is a proper relationship) through their network ties. Based on the Chicago Health and Social Life Survey (n=890) containing information on up to six social friends, our paper supports the following four observations: 1) Social network effects are found, even after controlling for individual risk factors, such as number of sexual partners, drug injection, gender, and race.

2) As the number of sexual partners increases, the network impact of information strengthens. In addition, as the number of sexual partners increases, control is more effective through third party embeddedness.

3) Among people who had less than 13 sexual partners for life time, people with no social friends are only 0.4 times as likely to be infected as people with one or more social friends. This advantage seems to be achieved through stronger dyadic control rooted in the sexual partnership itself.

4) Among people who were very sexually active (13 or more partners for life time), people with many (5 or 6) friends but weak ties to them (talk less than once a day) are only 0.2 times as likely to be infected as people with a few strong social ties. This protection seems to arise from the flow of network information and third party embeddedness.

Networks and Game Theory, Network Exchange

Elisa Jayne Bienenstock, Phil Bonacich

Chance or Intended Reciprocity

Dean M. Behrens
University of Toronto

Research on reciprocity has examined a number of characteristics of the phenomenon, such as: 1. The content of the reciprocated exchanges; 2. The timing of the reciprocated exchanges; 3. The partners involved in the exchanges; and 4. The balance or imbalance which may result in an exchange. However, in order to understand reciprocity, it is important for the researcher to consider the difference between motivated behaviour and behaviour due to chance.

In order to understand this motivated behaviour, it becomes necessary to ascertain what the base rate is for reciprocated exchanges due solely to chance. This latter assessment is contingent on a number of factors. Namely, how many individuals in a network are givers (G); how many individuals each member (E_i) is connected to (sum (A_i)); how many times each person may be a giver that is can we give the same thing multiple times, or do we have multiple things to give; and how many times each person can receive. This paper attempts to provide the formulas to calculate the base rate amount of giving due to chance, for any sized network.

The emergence and adaptation of cooperative networks

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INSEAD

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Stanford University

This paper uses agent-based simulations to explore the emergence of cooperative networks and their effects on the individual and systemic adaptation to sudden environmental changes. We assume rational agents that seek to enter cooperative exchanges to fulfil exogenously determined needs. In doing so, an agent (ego) engages in a variant of a Prisoner's Dilemma game in which decisions to cooperate or defect are guided by the agent's tolerance for risk, by her need for a specific other agent (alter), and by available information about the trustworthiness of that alter. This information is obtained directly from memories of past encounters with alter and indirectly through communication with third parties who have encountered alter and who usually engage in mutual cooperation with ego. We examine the cooperation networks that emerge out of the cumulative decisions to cooperate or defect between agents, as well as the effects of those networks on the system and individual ability to regain prior payoff levels after a sudden change in the exogenous needs matrix that drives agents to seek cooperation. This simulation allows us to study the relationship between agency and structure in terms of network dynamics as well as the duality between the enabling and constraining aspects of social structure central to sociological theory.

Social Control and Network Structure in Collective Action

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University of Groningen

In this paper, we develop a game theoretical model that explains how and under what conditions social networks rationalize participation in collective action. The collective action dilemma is combined with local interaction games, in which behavioral confirmation and social selective incentives are transmitted through relational ties.

Local interaction is embedded in the collective action game, therefore social networks affect contribution and participation also influences network relations. Our analytical and simulation results show that on average, network density

and selective incentives foster contribution. However, the model also highlights some controversial effects of them and of other network characteristics, such as structural holes. Besides, we address the question how social control influences the role of weak bridging ties in collective action. We also introduce an equilibrium refinement that takes into account the opportunity of breaking relations. We show that only networks, in which contributors and defectors are segregated, can be in stable equilibrium.

Children's Information Exchange Networks: Kids, Toys, and Play

Mirit Shoham
Cornell University

This study explores children's networks of information exchange. More specifically, it questions the role that discussion and exchange play in the formulation of toy preferences. After being given the choice of one of four toys, how will information offered from peers influence subsequent toy preference? By collecting friendship network data from an elementary school classroom, a unique intervention tests the emergence of such network behaviour: Children are allowed to discuss toy choices, and pre-discussion versus post-discussion choices are compared. Friendship networks are also investigated in contrast to the emerging information networks of the discussion. The following hypotheses, integrating Core Theory (Bienenstock & Bonacich, 1992), Equidependence Theory (Cook & Yamagishi, 1992), and Expected Value Theory (Friedkin, 1993) are tested and explored: 1) Peripheral students will seek the expertise of core members; final toy choices will reflect the core's initial toy choice, 2) Children's initial toy choice will resemble fellow-clique members' choices (Hallinan & Smith, 1989), 3) Integration in the friendship network is inversely related to proxemic distance during discussion (Festinger, Schacter, & Back, 1948). Findings are shared and discussed within an integrative framework of network exchange and child development, highlighting the importance of social networks in introducing children to the adult world.

Network Formation Models with Costs for Establishing Links

Marco Slicker and Anne van den Nouweland
University of Oregon

We study endogenous formation of communication networks in situations where the economic possibilities of groups of players can be described by a cooperative game. The goal of this paper is to study the influence that costs of forming communication links have on the structures that are formed. In order to be able to isolate the influence of the costs, we assume that costs are equal for all possible communication links. Starting from costs equal to zero, we increase the costs and see how these increasing costs induce different equilibrium communication structures.

The most surprising result of the paper is that, regardless of the number of players, under some circumstances increasing costs initially lead to the formation of fewer links, then to the formation of more links, and finally lead to the formation of fewer links again. This shows that subsidizing the formation of links does not necessarily lead to more links being formed. Hence, authorities wishing to promote more cooperation cannot always rely on subsidies to accomplish this goal. In fact, such subsidies might have an adverse effect.

Some Holes in the Consequences of Cohesiveness and Solidarity

Geoffrey Too tell
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Many sociologists have associated solidarity or cohesive-

ness with various "positive" consequences, from social order to less anxiety, greater contentment, or higher productivity. But research has shown these generalizations are untrue. Such processes can be conceived as a structural or relational variable operating on a behavioral variable where some contextual data are given. They can be modeled for a variety of problems with real valued variables, $Ax = y$, where x is the DV, A is an $n \times n$ matrix, and x and y are n -vectors. Where this applies, the anomaly above can be explained by a property of nonnegative matrices: If $A, y > 0$, the generalization ($x > 0$) is false. Then only under certain conditions can the inverse of A and x be nonnegative. These conditions may produce structural holes, which helps explain some very different reasons than those usually given why this concept may be useful. Where positive and negative signs denote major differences (like, dislike), this implies that in situations of this sort, solutions may be more likely to be "vexatious" than "positive," an ironic consequence of an agreeable beginning.

Networks in East Asia

Yanjie Bian

Social Networks and Job Matching in China's Transitional Economy

Yanjie Bian

U of Minnesota, Hong Kong Univ. of Science & Technology

After reviewing sociological theories about the roles of social networks in job finding and job matching in market and redistributive economies, I propose competing hypotheses to explain two related phenomena in China's transitional economy. First, why are strong ties, rather than weak ties, persistently important in job finding whether labor markets are absent or present? Second, to what extent is job matching a function of job seekers' social networks in the urban labor market? Both questions are examined by taking advantage of the changing modes of labor allocation in China from 1956 to 1999, the period in which respondents of a multi-city sampling survey of urban workers experienced occupational mobility. The focus of analysis is on the distinction between network resources of information and influence, which are for the first time in empirical research measured quantitatively.

Social Capital and Getting Ahead: Evidence in Multinational Corporations in Taiwan

Ray-May Hsung
Tunghai University

Esther Ngan-Ling Chow and Ming-feng Lin
American University

Social capital plays important roles for employee getting ahead within a firm. Employee with networks containing more social resources and more diversified social resources upwardly mobilize better. The diversified social networks produce benefits more through wider information accessibility and fast information diffusion, through effective referrals, and through efficient controlling networks. Therefore, employee with more diversified networks can play better role of managers and have greater probability to get ahead within a firm. This paper is not only interested in this rational dimension of social capital theory on the performance of employee within a firm, but also is interested in the dimension of trust, or guanxi, on getting ahead within a firm. This paper attempts to use 48 in-depth interview cases and 569 survey data of 9 manufacturing firms to study the function of two dimensions of social capital on job promotion within firms among Japanese and American corporations in Taiwan.

Composition of Support Networks in Hong Kong

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Gina Lai and Y.S. Pang
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The composition of three types of support network (instrumental, emotional, and social companionship) were studied on the basis of a random sample of 1121 Chinese residents aged 18 or above in Hong Kong in 2000. It was found that the close kin played the most important role in all the support networks, especially in instrumental functions. Among the close kin, the spouse/partner was most important, followed by children (especially for the elderly) and parents (especially for the young adults). These finding Close friends were generally not as important as the close kin, but their roles in emotional support and social companionship cannot be ignored. Other friends (neighbors, coworkers, classmates, acquaintances, etc.) and the extended kin, however, seldom played a supporting role. The support of professional workers or institutions was rare. These patterns of social support was generally held among the different gender, age, educational, or marital status groups. It is noted that about 10 per cent of the pe Our findings in Hong Kong will be compared with those in the West and in other parts of China.

Organizational Outcomes of Use of Personal Ties in Job Search: A Study of Chinese Workers in Urban Shanghai

Gina Lai
Hong Kong Baptist University

Industrial and labor reforms launched by the Chinese government since the mid-1980s have altered the once stable, imperative relationship between workers and the workplace. The introduction of market forces in the urban economy has led to the proliferation and expansion of non-state economic activities, major restructuring of the state sector, and the emergence of urban labor markets. Some notable social consequences of the urban reforms include massive laid-offs in state enterprises, heightened job mobility, and increased variations in wages among workers. Urban workers are losing job security and welfare benefits that were once guaranteed by workplaces in the pre-reform era, but in return, gaining greater freedom to exploit market opportunities. One essential question is what has become the binding forces between workers and today's Chinese workplace. Further, personal ties have been documented as a popular method used by the Chinese in job search. Personal ties has been argued to facilitate the transfer of job information, such that job seekers would have better knowledge about the job and the organization, in addition to what is formally advertised, before making the application and/or accepting the offer. On the organization side, through personal ties, employers would have better knowledge about job candidates, which cannot be otherwise obtained from formal applications, for example, personality and character. Thus the use of personal ties would presumably allow better match between workers and organizations than formal methods. The present paper aims to examine the organizational impact of use of personal ties in job search. Focus will be put on workers' commitment to organizations. Both affective and behavioral dimensions of commitment will be investigated. Survey data of 300 Chinese workers in urban Shanghai will be used for analysis.

The Role of Trust in the Governance Structure of Subcontracting System - Taking Taiwanese Hi-Tech Firms as Examples

Jar-Der Luo and Yung-Chu Yeh
Yuan-Ze University

Among so-called New Institutionalism economists, Williamson helped the thinking of this school to move forward an

important step by linking organization structure with transaction cost. In his famous problem "markets and hierarchies", minimizing transaction cost is proposed as the rationale behind organizational structuring. Markets and hierarchies respectively provide controls for malfeasance in transactions, but also incur costs. An intentionally rational actor will choose the most cost-efficient way to carry out his/her transactions, therefore transaction cost is a determinative factor in deciding where a transaction should be executed -- in markets or in organizational hierarchies, and this in turn determines the form of organizational structure.

Granovetter, in his famous embeddedness argument, challenged Williamson's approach. He insisted that any transaction is embedded in social networks, and the trust generated by personal interactions is helpful in discouraging malfeasance. Whenever a market lacks adequate information and information searching constitutes a significant portion of transaction cost, a synergetic relationship will be valuable in reducing costs, since it is always a primary source of reliable and abundant information. Embeddedness view thus can help us to recognize the role of social relation in the governance structure of any form of contracts.

Following the approach of embeddedness, many studies in Taiwan has investigated the role of trust in building and managing bilateral governance structure between up-stream firms and subcontractors. These studies found that commercial networks in Taiwan are closely connected with traditional social structure, with social relations deciding what governance structure are to be created in traditional industries. However, it seems not characteristic of Taiwan's hi-tech industry. Since hi-tech industries require a high-level know-how in their production processes, it is understandable that quality of supplies rather than social relations is the most important criterion in choosing subcontractors. Furthermore, for fitting in the requirement of ISO9000 by that Taiwanese hi-tech firms can do OEM jobs for world-famous brands, these firms adopted a world-recognized standardized process and documentation to manage subcontracting relations. Since the governance of relational contracts is mostly ruled by institutionalized mechanisms, where are the room left for trust generated by social relations?

Is embeddedness approach still applicable in subcontracting system of hi-tech industries? In this paper, we will examine the details of governance in each step of the eight steps of ISO9000 subcontracting process. By deep-interview and direct-observation methods, the following questions will be answered: 1) What is the institutionalized mechanism controlling subcontracting actions in each step? 2) Is there any industrial norm or technological rationale controlling these actions? 3) Where is the room left for social relations to manipulate contracts? 4) In what circumstances are contract laws not followed? Thus, social relations happen to function. 5) How is transaction cost influenced by the operation of social relations in this relational contract?

The Subjective Meaning of Friendship-the case of China

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This study explores the subjective meaning of friendship ties in a Chinese context. In a survey conducted in Tianjin, China in 1996, we ask the respondents to list up to three qualities of their best friend. We have identified three dimensions from their responses. The dominant dimension is about trust and understanding. Under this dimension, more than 80% of the respondents have used the words such as honest, loyal, sincere, reliable, or trustworthy to describe their best friend, and they believe that best friends should be able to understand each other completely and they should be able to tell each other everything. More than 60% of the respondents have mentioned qualities under the

second dimension about mutual help. However, it is not about how much help one may receive from one's best friend, but about the person's willingness to help others without expecting any return. In other words, it is about whether the person is someone one can count on in times of difficulties. This is in fact another aspect of trust. About 1/3 of the respondents have also mentioned personal characters of the best friend-from being principled and moral, to being kind and warm. No group difference, due to gender, education or age group, is detected in regard to this general response pattern, and this implies a level of agreement among people about what friendship means, at least when they are talking about "true friends."

Networks in Politics and Public Policy

Volker Schneider, Patrick Kenis

*People of Japanese Descent
Networking throughout Pan America,
and Its Effects on Politics and Public Policy*

Millie Creighton
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This paper presents research done on Nikkei (people of Japanese descent) attempts to create networking links throughout North and South America, Australia, and with Japan, based on an ethnic heritage of Japanese descent through a focus on the creation and activities of PANA, the Pan American Nikkei Association. The paper discusses ways in which this networking organization has enabled stronger links with Japan and a connected networking of Japanese descent communities through North and South America, while impacting policy decisions in Japan about foreign labour transmigration, particularly for Latin Americans working in Japan. It also discusses how the networking activities of this larger international organization have been pivotal in affecting political and policy decisions within individual countries. Networking through PANA helped Latin Americans who were brought to the U.S. and interned during WWII finally gain recognition for their redress claims under the Clinton administration, and how activities of this organization interfaced with Peruvian President Fujimori's political rise and fall, and Japan's public presentation of the Peruvian hostage crisis, in which a large number of Japanese were held in lengthy captivity following the takeover of a Japanese ambassadorial party in Lima.

The Last Three Governmental Periods (1982-2000)

Analysis of the Mexican Political Network

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Instituto de Investigaciones en Matemáticas
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The political power network in Mexico has been analyzed from different view points. We have described its historical evolution that gives origin to the formation of strong cliques; the main actors centrality, as a measure of power and as a influence distribution. Also we have analyzed the Salinas' political core through time (more than 30 years), in to known the power and their cliques pertinence of each actor through time. We have also done a global analysis of that network. We focused in the present paper in the identification of the main coteries to witch the political actors, that were working from 1982 to 2000 in the central government, belong. What groups were retaining the political control in the government through time. At the same time we find out the professional origin identification and their cliques they belong.

*From Elite Reproduction to Elite Adaptation:
The Dynamics of Change in Personal Networks of
Slovenian Elites*

Hajdeja Iglic and Andrej Rus
University of Ljubljana, Slovenia

This article deals with the process of elite adaptation in Slovenia in the period between 1988 and 1995. While negotiated settlement between the old and new elites in Slovenia contributed to high reproduction rates of Slovenian old elites, there was significant change going on within the new and old elites. By looking at their ego networks, we show that the debate on elite reproduction is overlooking an important aspect of change, i.e. the adaptation of elites. We analyze changes in the composition of elites' networks and find that in spite of high reproduction rates, there was extensive fluctuation in the old elites' networks. We also find that changes in the composition of networks were the result of strategic choice by the members of the new and old elites. These results indicate that Slovenian elites underwent significant changes that simple measures of elite reproduction fail to uncover and that they were a result of conscious elite adaptation rather than induced elite accommodation to regime change. We argue that because it shifts emphasis from elite reproduction to the actual social processes, the concept of elite adaptation provides superior tools for the analysis of transition in those societies that experienced negotiated settlement of old and new elites.

*Neoliberalism and Changes of the State Elite in
Mexico*

Larissa Adler Lomnitz, Jorge Gil-Mendieta
National Autonoma University

Since the 1950's most of the highest positions of the state apparatus in Mexico were occupied by lawyers trained at the public National University of Mexico. Their main function was to build up the post-revolutionary regime and to regulate its social and political life. By the 1980's, however, the country suffered a serious economic crisis (the so-called "the foreign debt crisis") which forced the government to introduce structural economic adjustments following the "Washington Consensus" resulting in the implementation of neoliberal policies. As a consequence a new technocratic elite of young economists trained at private universities in Mexico and the US has been replacing the old political elite of lawyers. In this paper we will present tables and graphs showing the progressive increase of economists in the upper levels of the State apparatus and some of the actor's personal networks through which they rose.

*From Authoritarianism to Democracy:
the Role of Alternative Political Networks in Mexico*

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Universidad Autónoma de Ciudad Juarez

Jorge Gil-Mendieta
IIMAS, Universidad Nacional Autónoma de México

The Mexican political system produced seventy years of political stability, due in part to a strong political network with a complex architecture. This network secured allegiance and discipline, which allowed government to take drastic measures as well as to articulate long-range policies. The recent defeat (July 2, 2000) of the ruling Institutional Revolutionary Party (PRI) has a strong potential to disrupt the network's cohesion and simultaneously to allow the creation of alternative networks. Some of the components of these networks have historical roots but they still have to consolidate themselves. We assume hypothetically that the consolidation of Mexico's democracy will require the consolidation of alternative networks to facilitate political cohesion. A new government who needs the old network will be unable to forge the changes the country needs to move from an authoritarian to a democratic system. In this paper we will explore the origin and development of the ruling and alternative networks.

The Political Field and Cooperation among Individual Actors

Ludwig Zurbriggen
University of Fribourg

The paper addresses the question if cooperative interaction between political actors within the same party can be explained by their position in the field of the party. Network Analysis is used to determine the relations individual actors maintain among each other. The study classifies the actors in several categories (blocks), according to the structural equivalence of their relations. The position of these categories in the partisan field is explored by means of correspondence analysis. The analysis aims to show the elective affinity between the position in the partisan field, political attitudes and block membership. Furthermore, the paper explores the question if the blocks of actors can be considered advocacy coalitions and will eventually propose a typology of partisan actors.

The paper draws upon a survey of 400 Christian democrats in Switzerland, which are influential in their respective cantonal party. The paper takes advantage of the multilingual character of Switzerland by comparing christian democratic parties from different language regions of Switzerland.

Network Sampling Issues

Marinus Spreen, Tom Snijders, Ove Frank

The Effect of Sampling on Centrality Measures

Elizabeth Costenbader
Johns Hopkins University School of Public Health
Thomas Valente
University of Southern California School of Medicine

A potential barrier to network data collection and implementation of network interventions in many settings is the perceived cost that interviewing a large portion of the network will entail. Researchers have been motivated to interview a large portion of the network out of concern that network measures become increasingly unreliable as sample size decreases. This study is designed to determine more precisely the sampling level at which network measures of centrality become unstable. In this study, we consider eight network measures of centrality; in-degree, out-degree, degree symmetrized, betweenness and betweenness symmetrized, closeness, radiality and integration which we calculate repeatedly at increasingly smaller sample sizes on data collected in six studies consisting of 58 different networks.

Estimating the Size of Homeless Population in Budapest, Hungary

Beata David
Sociological Institute of the Hungarian Academy of Sciences
Tom Snijders
University of Groningen

In this study we try to estimate the size of the homeless population in Budapest by using two 'non-standard' sampling methods: snowball sampling and capture-recapture method. Using two methods and three different data sets we are able to compare the methods, the results and also suggest some further applications. Apart from the practical purpose of our study there is a methodological one as well: to use two relatively unknown methods for the estimations of this very peculiar kind of population.

Estimation of Population Characteristics from One-Wave Snowball Samples in Structured Populations

Tom A.B. Snijders
University of Groningen
Ove Frank
University of Stockholm

We consider a one-wave snowball sample in a population composed of individuals who are distinguished by their values on one or more covariates (e.g., drug users with, and without, a home). It is assumed that relation frequencies and the sampling fractions in the initial sample can depend on these covariates. We derive model-based and design-based estimators for population means and population totals of a quantitative variable in this population. This extends our earlier work on the estimation of the size of the population.

Estimating the Number of Drug Abusers Using a Network Sample

Marinus Spreen
Maastricht University

In this paper we discuss the problem of estimating the number of drug abusers for studies in which a substantial part of the study population is registered and the total unknown population is conceived as a graph. Using a random sample from the registered drug abusers and observing their drug abusing network members, we discuss 4 network order estimators, i.e. a multiplier-, truncated Poisson-, Bernoulli- and capture-recapture estimator. The different assumptions underlying these estimators are discussed and illustrated with results of a drug abuse network sample in Heerlen, The Netherlands.

Networks on the Web

Karen E. Pettigrew, Julie Hershberger

Structuring Large-scale Online Discussions: Making Use of Network Analysis Methods

Steffen Albrecht
Technical University of Hamburg-Harburg

Since long, the Internet has been discovered as the medium that is ideally suited for discussions and deliberative exchange. For example, online communities were a phenomena of the early days of the Internet, and with the invention of the WWW, web-based forums became widely used by the growing mass of "Netizens".

Online discussions provide many advantages over face-to-face or telephone based forms of communication as is well documented in the literature on computer mediated communication. But when it comes to large scale public debates, the web turns out to be a bottleneck: complex discussions are extremely hard to follow, and important messages and data are lost in the mass of information that is exchanged. For applications of online democracy as well as for any true many-to-many communication that require broad participation, this is a major drawback. This paper proposes to use approved methods of the social sciences to help structuring such large-scale debates. Especially methods of social network analysis can be used to analyse the structure of a debate, to split up discussions that become too complex, and to support the personal contacts between actors. In the paper it is shown how these methods can be transformed into technological tools to support online discussions, and it is argued that they help making discussions more attractive. The research presented here is part of "DEMOS", a R&D project funded by the European Commission to support online political participation.

A Network Analysis of International Internet Flows

George A. Barnett, Bum Soo Chon, Han Woo Park
State University of New York at Buffalo

Devan Rosen
Cornell University

This paper argues that the Internet is evolving from the existing telecommunications system, but incorporating additional functions (asynchrony and science) inadequately provided by the old system. Using network analysis, it describes the structure of international Internet traffic based on data obtained from the Organization for Economic Development for July, 1998. It also examines the relationship between the structure of the Internet and international telecommunications, as well as trade, air traffic, telephone rates, language, physical location, science citations, student and immigrant flows and structural asynchrony. The results indicate that the structure of the Internet is significantly related to the structure of the international telecommunica-

tions, air traffic, trade, science and student flow networks at earlier points in time, as well language and asynchrony. However, in combination, only telecommunications, air traffic, science citations, asynchrony and either trade or student flows were significant, accounting for over 62% of the variance in the structure of the Internet.

*Online Community Communication Networks:
Internet Club Applications*

Dean H. Krikorian
Cornell University

Wellman and Gulia (1999) laid the groundwork for examining online, virtual, communities from a network perspective. They conclude that online communities are unique forums, yet also exhibit patterns of face-to-face communities (see also Rheingold, 1993; Smith & Kollock, 1999; Wellman, 1999). This paper empirically explores online community-building processes by examining over time communication patterns of Internet clubs. Internet clubs such as www.clubs.yahoo.com (>100,000 clubs housed) provide multimedia capabilities such as message boards, online chat, calendars, links, photos, news, and private/public club formation options, and are rapidly proliferating via the Web. Based upon work by Krikorian (1999; 2000), Internetwork measures are described and applied to Internet clubs. Internetworks include extant network measures such as centrality indices, digraph techniques, tie strength, and semantic network analysis, yet also develop new network measures of message participation, thread and link proliferation, group member permeability, and lurker, visualization, and hit-rate indices. Important to this paper is the development of a self-organizing theoretic model ultimately used to assess the over-time sustainability of online communities. Implications explore the role of data mining, software development, future applications, and the relationship between online and face-to-face networked communities.

*Affiliation Network Structure of Top Websites:
Examining Affiliates with Hyperlink in Korea*

Han-Woo Park, George A. Barnett,
State University of New York at Buffalo

In-Yong Nam
Silla University

This paper argues that individual websites form affiliations with others for the purpose of strengthening their individual trust, expertness, and security. It describes the affiliation network structure of Korea's top 152 websites. The data were obtained from their websites for October, 2000. The results indicate that financial websites, such as credit card and stock websites, occupy the most central position in the affiliation network. A cluster analysis reveals that the structure of the affiliation network is influenced by the financial websites with which others are affiliated. These findings are discussed from the perspective of website credibility.

*Ranking and Visualization of Web Pages
using Social Network Analysis*

Ulrik Brandes
University of Konstanz

Methods for ranking World Wide Web resources according to their position in the link structure of the Web are currently receiving considerable attention, because they provide the first effective means for search engines to cope with the explosive growth and diversification of the Web. These methods are often based on spectral analysis and therefore quite similar to those common in social network analysis. We review some popular ranking methods (including the one used in the search engine Google) and show that, with the same type of computation utilized in all of them, a layout for effective visualization of a link structure can be determined.

Our visualizations provide valuable insight into the structure and the ranking mechanism alike, and are particularly useful for large social networks, i.e. with hundreds to thousands of actors.

*Function(s) of Inter-actors' Web Links
and Functionality of World Wide Web's Structure*

Gregor Petric
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The study proposes a theoretical typology of links between web sites of different social actors and empirically examines hypertextual features of the structure of Slovenian World Wide Web.

Following claims of founding fathers, the World Wide Web was initially designed on the idea of hypertext, a system developed for fast and efficient access to information. Two problems are under investigation: how is the hypertext's essential feature, a hyperlink, being utilized in the web and secondly to what extent does the structure of the world wide web reflect ideas of the hypertext. Starting from functionalist perspective and following Merton's and Giddens' discussion on reasons and intentions of human action, a typology of links between web sites of social actors is proposed. Categories of 'informational', 'identity formation', 'support' and 'promotional' web links are extended by considering the type of social actors. Further on, functionality of the World Wide Web is investigated on the structural level by taking relevant structural features of hypertext-intertextuality, decentrality and non-linearity as a criteria. Using a web robot, a whole network was generated with nodes representing web sites of Slovenian individuals and organizations and relations representing external links between web sites of these social actors. A limited, non-conclusive number of results will be presented.

*Fostering Social Capital Using the 'Net':
Perceptions of Community Network Users,
Information Providers and Organizers*

Karen E. Pettigrew
University of Washington

Joan C. Durance
University of Michigan

Online community networks have been lauded for their potential to strengthen physical communities through connecting individuals and groups, by increasing information flow about local services and events, and through facilitating civic interaction. Past studies, however, suggest that Internet use has the reverse effect by isolating individuals and decreasing interpersonal interaction. We present findings about how online networks benefit physical communities based on extensive case studies in three states. Our study focused on how online networks build community and affect different players such as service providers who post information about their services on the Internet and public library staff who organize and maintain these networks, as well as on citizens' online information behavior when seeking help for everyday situations. In our paper we discuss how online networks foster social capital at the individual and community levels, along with methodological challenges with conducting online surveys.

*The [Hungarian] Internet Economy: a Network
Approach*

Balazs Vedres and David Stark
Columbia University

There are numerous studies regarding the social consequences of the Internet, but few about the sociological model of the Internet economy itself. The paper presents a multi-domain interorganizational model of the Internet economy in which the various domains have distinctive

measures of value. The domains are: backbone connections, access providing, website hosting, content providing, investing, advertising and e-commerce. Each domain has a unique determinant of position, and there is a network of value-translations between the domains. The principle of positioning is distinctive to each domain, yet actors can be present on more than one. We analyze the overall position of actors in the Internet economy, the typical strategies of multi- or single domain players, especially ISPs, who are present on most of the domains. Theoretical questions about the economic-sociological models of coordination are also raised regarding the triplet of markets- hierarchies-networks.

The Hungarian Internet economy provides an empirical case for elaborating these concepts. We utilize interviews and archival data to analyze positions in each domain - some of the positions are based on attributes, some of them are based on relations, as the nature of each domain suggests it. Backbone network positions, the network of hyperlinks and hosting relations are analyzed by a multiple network approach. We also add the symbolic dimension of the discourse on the Internet economy to our analysis to help explain the struggles for positions in the multi-domain arena.

Does the Internet Depress, Amplify, or Increase Social Capital? Evidence from the National Geographic Survey 2000

Barry Wellman, Anabel Quan
U Toronto

James Witte
Clemson U

Keith Hampton
MIT

Public, policy and scholarly debate has been intense about three ways in which the internet are affecting social networks and social capital:

1. Does the internet so tie people to their screens that their in-person and organizational relationships atrophy (Kraut, Nie, Putnam)?
2. Or does the increase communication possibilities of the internet amplify people's in-person participation in community and organizations (Barlow; Wellman and Gulia)?
3. Perhaps both sides are overly privileging the internet, and there is little relationship between life online and "real life".

Our evidence comes from a 1998 40,000-person survey of visitors to the National Geographic Society website, one of the first large-scale web surveys done. We find little evidence that the internet depresses networks and capital. We find some evidence of amplification. But the most prevalent phenomenon is that people's interaction online adds on to their face-to-face community and organizational involvements.

Our evidence strongly suggests that the internet is rapidly becoming normalized as it is incorporated into the routine practices of everyday life. Rather than reducing social life, it is probably reducing a more asocial, one-way form of communication: TV watching.

The "Web" of Semantic Network Analysis: Artificial Neural Networks and the Internet

Devan Rosen
Cornell University

This paper addresses the applicability and power of using semantic network analysis to study the Internet as well as employing the Internet as a tool for developing understandings of social networks based upon shared meaning. Past research examines how content-analytic neural networks can be applied to the Internet. Among these studies is a

geographical representation of Internet navigation. Extending the research of text-based semantic networks, current projects are described which utilize semantic network analytic techniques to study interaction in visual-based virtual reality (i.e., 2 and 3-dimensional graphical spaces). Online software development highlights the incorporation of Self Organizing Systems Theory in a Web-based shell. Integral to this paper is the ever-changing face of the Internet which includes multimedia capabilities of networked communication. Potential applications are discussed in light of in educational, organizational, and environmental contexts.

Personal Community Networks

Douglas Adams

Ethnic boundaries in the class? Assessing the influence of ethnicity and ethnical population distributions on the distribution of social relationships within schools

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Utrecht University

The proverb "meeting is mating" refers to the idea that the chance that two people from different origins engage in a social relationship depends on the chance that they meet. This leads to the hypothesis that the number of inter-ethnic and intra-ethnic positive relationships within a complete network is a constant proportion of the number of inter-ethnic and intra-ethnic dyads. However, many authors state that there is more to mating than meeting. They argue that people select others with similar cultural outfit. This would lead to the hypothesis that the proportion of intra-ethnic relationships is larger than that of inter-ethnic relationships.

The two hypotheses are seldom tested thoroughly on complete networks. In this paper we present results from The Dutch Social Behaviour Study, concerning the social relationships between high school pupils in 20 schools. In 1995 1,317 pupils completed a survey with individual items and ten network items.

The first hypothesis seems to be supported, but some strange effects remain. Our first analyses suggest that strong cultural distance effects exist. The hypotheses were tested by a two-step procedure, using the P2 model for each school network in the first step and relating these results to school characteristics in the second step. In the paper, we will present the results of the analyses.

Social Networks In International Migration: The Case of Hungarian Emigrants in Finland

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The present paper is aimed at analysing the channels and functions of migrants' social (people's) networks as well as their effects on international migration and social adaptation. Contemporary emigration trends stemming from the Visegrad Region after the collapse of the socialist regimes in 1989 have shown that traditional, neoclassic utility maximisation models are insufficient to account for all migratory events and migration related questions.

It is suggested that issues such as the path and the country of destination chosen by migrants, irrational non-migration and the people participating in these movements can be better analysed if viewed from a systems approach, as evolving a case study among Hungarian migrants moving to Finland between 1960 and 2000 was conducted based on

in-depth interviews to identify changing migratory patterns. The structural analysis of the social networks established by these emigrants has provided a key not only to mapping an ethnic community's life abroad, its social integration or to drawing a general migrant profile, but also to predict future migration patterns. The analysis has shown how the Visegrad Region has reintegrated into the world migration systems on the periphery of developed Europe and it has also reinforced the importance of various people and non-people linkages in determining international migratory patterns.

Gang Networks as a Subset of Friendship Networks:

A Preliminary Analysis

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Regina Day Langhout
Illinois State University

Literature on youth gangs defines a gang as a group of individuals who commit crimes but such literature often overlooks the details of the relationships among members of gangs, does not examine the nature of the assumption that a gang is a group, assumes that a gang group is homogeneous with regard to the gang affiliation of its members, and that members of one gang will have no friends who are members of other gangs. Field research in Champaign, Illinois, focused on two cohorts of adolescent and youth adult gang-involved females: (a) girls who are actively involved in gangs; and (b) girls who used to be actively gang involved. The research is based on the premise that youth gangs are an effective means to amass social capital in neighborhoods where human capital is low and where household poverty is everpresent. Given conditions of abject poverty, it would be expected that individuals' best survival strategy would be to expand, not to minimize, the number of ties to individuals who may have the resources needed for daily survival. If this assumption is true, then the friendship networks of the members of a cross-section of local gangs should include girls who are not gang members as well as girls and guys who are members of gangs other than ego's. Friendship networks were generated from gang girls in the active and inactive cohort. This preliminary analysis provides the demographics of friendships networks and finds that networks of active gang girls are larger than inactive members, most girls were friends before they were members of the same and/or different gangs, the primary function of a gang network is protect ego against aggression, and it is common for ego to request protection from members of her own as well other gangs. These findings suggest that girls' friendship networks in a highly impoverished area serve a critical survival function where survival is best achieved with multiple relations to a wide network of long-term friends.

*Law and Order:
Explaining Obedience using Ego-Networks*

Ju-Sung Lee
Carnegie Mellon University

Network correlates of deviance and civil disobedience are examined using response items involving obedience to the law, indicators of deviant behavior, and the social network module of the 1985 General Social Survey (GSS). Preliminary findings show that size and heterogeneity of individuals' confidant ego-networks best predict, above demographic correlates including education, individuals' propensities to find disobedience to the law permissible given appropriate circumstances. These networks are less likely to be family-oriented and include more friends and co-workers. Both the confidant and friendship networks are less interconnected (i.e. less cliquy) and contain ties that are unequal in their intensities of affect. Implications on social control and deviance theories are discussed.

A Structural Analysis of Fraud and Armed Robbery Networks in Norway

Marianne Aether and David Canter
University of Liverpool

There is some debate in the few existing studies of criminal networks as to the extent to which they are structured like conventional legitimate organisations. To examine this the social structure of three criminal networks were explored that mostly engaged in armed robbery, car crimes and fraud. The main hypotheses were that it would be possible to identify subgroups, key individuals and leaders in these networks and thereby understand more fully the ways in which they were organised and their inherent vulnerabilities.

Data obtained from the National Criminal Investigation Service (Kripos) in Norway consisted of police reports, witness and suspect interviews, telephone records, newspaper reports and court reports as well as information on the offenders previous convictions. This was analysed using measures taken from Social Network Analysis (SNA), using the specially developed Ucinet V program, developed by Borgatti, Everett and Freeman (1999). This allowed the determination of the centrality,

N-clan and clique properties of the networks studied. This allowed the individuals in each network to be ranked according to their influence on, involvement in, and the number of connections they had within the network.

The validity of these results were examined by relating the ranks to information available in suspect and witness interviews that included information about their roles in the crimes.

The analyses did indicate the presence of subgroups and key individuals. Each subgroup did have distinguishing crime-related features, for example focusing on fraud, robbery, car crime or being assistants in other crimes. The individuals ranked by the centrality measures as being important were found to be the potential core members in the network even though they did not seem very important from initial examination of the police files. Leaders of the networks, however, were not clearly identified through the SNA measures, possibly because they do not exist in conventional SNA terms because these groups work through a small number of individuals each of whom can take a leadership role depending on circumstances. It is further possible that the leaders, if there were any, keep a low profile and their crew might be the ones that are picked up by the analyses due to their more active involvement. Overall, the SNA program used proved to be a useful tool when it comes to exploring the data and would be of benefit to police investigations as a supplement to their normal procedures.

*Social Cohesiveness within Organizations:
Frequency of Informal Meetings and Social Bonds*

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Marijtte van Duijn
ICS / Dep. Statistics

In this paper two aspects of social cohesiveness within an organization, frequency of informal meetings and the social between employees are examined in relation to an increasing part-time employment. The problem of this paper is as follows: Is part time employment more influential on the frequency of informal meetings than on the social bond of the relationships. Besides the relationships between part-time employment and the two aspects of social cohesiveness, determinants of both aspects were examined and hypotheses were formulated. To test the hypotheses, network data of 39 employees within eight teams within one organization were collected and analyzed by means of the p2-model (Van Duijn, 1995). Contrary to our hypotheses, there

was no relation found between part-time employment and frequency of informal meetings. A relation was found between part-time employment and the social bond between employees: employees who are part-time employed have stronger social bonds.

Tramps R Us: The Social Networks of a Highly Mobile, Truly Disadvantaged Population

Steven K. Worden and Douglas Adams
University of Arkansas

The patterned array of relationships between social actors is one of the fundamental concepts of social network analysis. Such relationships potentially facilitate the transfer of information or material resources between social actors. Social network research that investigates the relationships between human social actors often generates relational data by utilizing questions about "people with whom you usually discuss important personal matters", or variations thereof. An implicit, and at times explicit assumption of the social networks generated by these relational data is that the relationships between the social actors are relatively ongoing and/or stable. However, for some groups of people, such relational stability may be an empirical question rather than a plausible assumption. In order to address this issue, we integrate concepts derived from symbolic interaction theory and social network analysis and then apply them to the ephemeral, serial interaction of highly mobile, truly disadvantaged individuals.

What we Owe to our Neighbors -Neighbor Relationships in Personal Networks in the Netherlands

Iris Zamir, Beate Volker, and Henk Flap
Utrecht University

Sociological theories on modernization and individualization as well as popular opinion hold that in modern societies the quality of social relationships is traded in for quantity: although one meets many others at different occasions one does not engage in intensive relationships. Personal networks become less dense and ties become more single stranded, that is, network members hardly have any contact with each other. This development would take place mostly in urban environments and especially affect ascribed relationships such as those between family members and neighbors. In this paper we inquire into neighborhood relations, the extent to which they are there, what pattern and contents they have, how they differ among individuals, and the influence of the kind of neighborhood. Neighborhoods are a particular apt research site to study the effect of meeting chances on mating, i.e., the formation of social relationships. We inquire into the social composition of and facilities present in the neighborhood. Next to these supply-side explanations, we consider factors that relate more clearly to the demand side. E.g. the attractiveness of investments in neighbors will depend on the support that is given or the lack thereof by the personal network outside of the neighborhood. We use recently collected data (the Social Survey of the Networks of the Dutch, SSND=1008) from a national representative survey in 160 neighborhoods. Our result show that two third of the people have at least one neighbor in their personal network, and usually neighbors occupy 1-30 percent of people's networks. Neighbors are a vivid but not very intimate part of the personal network, mainly important for practical kinds of help. Preliminary analyses show that relational characteristics and the need of an individual for a certain kind of help are much more important as an explanation of neighborhood ties than the opportunities to meet neighbours.

Scholarly Networks

Anabel Quan-Haase , Barry Wellman

Co-evolution of Knowledge Networks as Public Goods and Transactive Memory Systems: Using Computational Models for Theoretical Integration and Extensions

Noshir Contractor, Edward T. Palazzolo,
Dana Ann Serb, and Christine Quechuan
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The pervasiveness of electronic communication media in organizations makes it increasingly difficult for individuals to discern social and knowledge networks. Specifically, it is increasingly difficult for individuals to accurately determine: "Who knows who?" "Who knows who knows who?" "Who knows what?" and "Who knows who knows what?" The "who" could be human agents or non-human agents such as knowledge repositories, webbots, or avatars.

In response to these concerns, several scholars have identified the need for recommender systems (Resnick and Varian, 1997) or community ware to help enhance individuals' ability to access an organization's knowledge network and make visible the organization's virtual social and knowledge networks. One such system is IKNOW (Inquiring Knowledge Networks On the Web; <http://iknow.spcomm.uiuc.edu>).

The availability of such systems makes it increasingly relevant to ask the following questions: Under what conditions, are individuals more likely to seek information they need from (or provide information they possess to) other human agents (such as individuals, groups) as opposed to non-human agents (such as knowledge repositories)? The theories of Transactive Memory and Public Goods both seek to describe the conditions under which agents share (retrieve or allocate) information in order to accomplish a collective task (Monge & Contractor, 2001). The Theory of Transactive Memory offers a set of peer-to-peer mechanisms to explain these processes in terms of an agent's perception of others' knowledge (directory updating and expertise recognition). Public Goods theory describes, in terms of agents' individual costs and benefits, the conditions under which as a collective they are more likely to share information with others by publishing to, and retrieving from, communal knowledge repositories. This paper describes how implementing and "docking" computational models based on these two theories offer new insights in response to the questions posed above and thereby improve the design of recommender systems.

Translating Crane's Invisible Colleges, Kuhn's Scientific Paradigms and Lotka's Law into Coauthorship, Thematic Evolution & Citation Indexing: Research Plan and Early Results

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Although largely theoretical in conception, Crane's invisible colleges and Kuhn's scientific paradigms address the sociological question of the structure of scientific innovation and its association with the individuals, teams and institutions producing scientific research literature. On the other hand, Lotka's law of scientific authorship is largely empirical with little sociological theoretical basis but is nonetheless frequently encountered in sociological studies of scientific literature. We examine the possible translation of these three ideas into operational and verifiable sociological concepts by analyzing four discernable and characteristic

aspects of scientific innovation. First, thematic evolution which is often operationalized as analysis of keywords describing research articles. Here cooccurrence methods, correspondence analysis and classification (clustering) methods are often employed. Second, coauthorship analysis which usually refers directly to social network methods. Third, the set of scientific journals publishing the research articles under analysis. Although seldom the subject of analysis, the definition of this set is often the determining factor in an analysis of scientific revolution. Fourth, citation indexing which analyzes who cites whom in their research articles. This specialty of the Institute for Scientific Information (ISI) also relies heavily upon social network analysis methods. We tie this research plan with previous analyses of sociological AIDS research literature which compared thematic evolution, coauthorship and a large set of scientific journals, finding that there are only two stable types of authors: "mainstream heavies" and "adaptive artists". We also present current research on the structure of German social science research literature ("GESIS Watch" project), looking at general thematic evolution and possible coauthorship and citation changes. We conclude with a presentation and some suggestions of research on further comparisons of the four aspects mentioned above, particularly the comparison of citation indexing with thematic evolution and coauthorship.

No argument: Problematizing cliques of exclusive knowledge production in sociology

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As a discipline sociology depends upon argument to ensure presentation of different views and to resolve differences (at least temporarily). Sociological texts must take account of the differing arguments on particular topics; doing so will be reflected in their citations of other texts in which such arguments are embedded. This is necessary to maintain disciplinary rigor and to make sociological knowledge relevant in non-academic/ public forums.

However some recent analyses have suggested the presence of potentially distorting effects upon knowledge production within sociology, and it could be that these are inhibiting effective argument. If so, this would be reflected in citations made. The ideal form of sociology described above would be representable as a well-connected network, or at least one of clusters joined by points with high degrees of inbetweenness. The second form would produce a network of isolated cliques with little or no interconnection, and connecting citations at best 'perfunctory'.

Networking scientific publications: An analysis of the coauthorship structure

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To what extent does the analysis of the coauthorship networks reflect the structure of a scientific community? In this investigation we present a useful procedure for the analysis of a coauthorship network. It consists mainly in a snowball process, combining common software packages as BiblioScape, Ucinet V and Pajek. The discussion of the results with the scientists object of study shows how the groupings obtained with algorithms based on cohesion strategies are reckoning as significant while the groupings obtained with structural equivalence algorithms were not identified.

Retrieval by Connectedness in Heterogeneous Digital Libraries

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Despite the fact that many Digital Libraries (DLs) are available on the Internet, users cannot effectively use them because of inadequate functionality, deficient visualization and insufficient integration of different DLs. In the framework of the Daffodil project (University of Dortmund, Social Science Information Center, Bonn) we develop a user-oriented access system for DLs which overcomes these drawbacks. One of the substantial innovations of the planned system is the implementation of network analysis methods to improve retrieval results. This approach takes into account information about the social status of scientific actors in co-author- and co-citation-networks. The paper presents a prototype based on heterogeneous bibliographic and citation databases in the field Computer Science.

Social Navigation and Social Networks

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Computer scientists, software designers and information architects are increasingly turning their attention to the design of algorithms and interfaces for the social navigation of information (e.g., Munro, Hook and Benyon, 1999; Dieberger, Dourish, Hook, Resnick and Wexelblat, 2000). As formulated by Paul Dourish and Matthew Chalmers in a short paper written for the international Human-Computer Interaction (HCI) conference (Dourish and Chalmers, 1994), social navigation is a means of navigating through a space of information (e.g., a database of texts, the WWW, archives of email, etc.) using the activities, comments, behavior, or appearance of others. Examples of social navigation include moving "towards" a group of people or examining a piece of information because others have examined it. Recommender systems (see Resnick and Varian, 1997) are currently a commercially important genre of social navigation systems (cf., amazon.com's "people who buy this book also buy these books..." feature). While it is true that some of these systems have been designed using a knowledge of social networks (e.g., Kanfer, Sweet and Schlosser, 1997; Smith, 1999), it would be worthwhile to open this area of software design more broadly to the criticism and suggestions of researchers who focus on social network analysis. What tools and techniques from social network analysis might be applicable to the social navigation of large archives of text, images, music, email, etc.? What results from social network analysis are currently being ignored or undervalued by designers of social navigation software? This paper sketch out the emerging area of social navigation and illustrate some of its strengths and weaknesses through demonstration of the Conversation Map (www.sims.berkeley.edu/~sack/CM), a system designed to graphically summarize large volumes of email through a calculation of emerging social and semantic networks implicit in the content and the headers of the email messages.

Does Citation Reflect Social Structure? Longitudinal Evidence from an Interdisciplinary Research Group

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Many authors have posited a social component in the citation practices of science and scholarship, the consensus being that the citers and citees often have interpersonal as well as intellectual ties. Detailed evidence for this belief has been rather meager, however, in part because social networks researchers have lacked bibliometric data (e.g., pairwise citation counts from online databases) and citation analysts have lacked sociometric data (e.g., pairwise measures of acquaintanceship). In 1997 Nazer extensively

measured personal relationships and communication behaviors in what we here call Globenet, an international group of 16 researchers with different backgrounds that was officially established in 1993 to promote work on human development from an interdisciplinary perspective. Since Globenet's membership is unambiguous, it was possible during 2000 to obtain individual citation records for all members in online searches of two databases from the Institute for Scientific Information, Scisearch and Social Scisearch. This permits examination of their citing of each other-i.e., their intercitation-and its possible growth over time. It is also possible to explore links between the citation data and Nazer's social and communication data. Intercitation networks are presented from four nonoverlapping periods: pre-1989 (baseline), 1989-92 (the four years leading up to the formation of Globenet), 1993-96 (the four years after), and 1996-2000 (the four most recent years, as institutionalization sets in). Several questions are addressed: whether intercitation grew over the periods studied; the extent to which it follows disciplinary or interdisciplinary lines; whether it patterns with degrees of acquaintanceship; whether it reflects Globenet's organizational structure; whether it is associated with particular in-group communication patterns; and whether it is related to the co-citation of Globenet members-that is, to counts of their joint appearances in the references of citers in general.

Social Capital

Nan Lin

Multiple Measurement of Social Capital in Hungary: an Assessment of National and Case Study Findings

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Robert Tardos
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The catchall feature of the social capital concept, the wide range of its interpretation implies a variety of possible consequences. In addition to a new upsurge of related fields such as social network studies it may entail a boost of theoretical efforts putting a number of sociological core concepts into new light but yielding a paradigmatic focus with an interdisciplinary character as well (from economics to the newly emerging 'econometrics'). The vagueness of the concept, the blurred outlines of its operationalization hides, however, serious dangers, capable to lead to an early frustration. It is not easy to assess the trade-off between the heuristic benefits of a multilayered approach and the concomitant methodological handicaps. While it is mostly advisable to go on with conceptual clarifications and sharpening the tools of related methodology, it seems premature to narrow the concept in a radical way or get committed with any of the possible indicators or techniques. This does not mean an unbounded approach even on the short term. It seems a necessary limitation for example to distinguish between a wider spectrum of resources involved in social networks and the more specifically capital-like elements (earmarked by investment and accumulation e.g.). In the same vein, it seems important to handle relationship-assets at the core of social capital separately from output-like moments such as norms or attitudes frequently put on a par with the former. The latter should, however, have their place among significant criterion variables in the frame of validity tests, construct-related measurement experimentations alongside with tests of internal consistency in a traditional sense. The iterative coupling of theoretical and empirical efforts can be facilitated by an alteration of study settings adding specific scenes (in the frame of case studies) to more general contexts (as surveys on national samples).

This objective has been followed when supplementing the pool

of our social network surveys of the Hungarian population from 1997 and 1998 (N appr. 1000 and 800) by a four-village survey in 2000 (N=728 as a whole) based on a 2 by 2 analytical design with a regional East/West (less/more developed) dimension on the one hand and a more concept-related distinction on the other (high and low civic participation measured by recurrent patterns of voter turnout, an aspect interpreted by some authors even as a manifestation of social capital). The more or less saturated village samples (with a coverage of 75 to 80 per cent of adult populations as an average) not only permit a contrast of in-degree measures with more generally used out-degree ones but also a pronounced substantive stress on community integration.

While the small size of these settlements may suggest a local closure in social relationships, they are far not homogeneous with this regard. The one among them in the most advantageous geographic and social position is characterized by a relatively wide range of outward contacts reaching beyond the local (in some respects even national) contexts. Its leading position on most aspects of network resources exemplifies experiences concerning the consolidation of various types of social capital. The application of various techniques such as an adapted version of the Lin-Dumin position generator (Lin 1999 as a recent development), alongside with a Fischer-GSS type of name generator, added by a roster of association memberships plus some specifically designed measures (such as mail networking and kinship patron roles and also some reputation measures related to the local scene) has permitted to survey an array of resources having to do with either the strong or the weak tie pole (or taking the perhaps even more telling triad of 'bonding', 'bridging' and 'linking' ties as by Woolcock 2000). Our case finding have corroborated our earlier national findings (Angelusz-Tardos 2001) pointing to the strategic role of weak-tie type of resources in the formation of social capital indicated not the least by the central place of position generator measures in the composition of global indexes. Most criterion-related analyses (to mention participation variables in the first place, more so with national than municipal elections) have exhibited a similar pattern. Specific cases have presented some important differences from this overall picture at the same time. The 'deviant' case (the village with high participation in the less developed and, as a rule, low-turnout region) has exhibited a relatively high overall score of network resources especially by its more numerous contacts of the strong-tie type. Also, as far as participation is concerned, embeddedness in these mostly kinship-related ties proves to be here the strongest predictor. (While at the opposite deviant case of low turnout in the West region it is the kinship patron role that presents the most significant relationship with participation, this time of a negative sign.) All this suggests the - theoretically well interpretable - protective role of 'bonding' ties at regions or periods of hardships and emphasizes the need of taking the specificity of various settings into account.

The data being still fresh, our case study analyses are far from finished, with renewed efforts ahead to cope with aggregation dilemmas of index construction (as detailed by Snijders 1999). A next phase of our analyses sets out to move from the individual to the collective level including family and neighborhood entities on the one hand and community-level structural characteristics of social integration on the other. A similarly important task will be, with some initial results to be presented in the Conference paper, to outline more concrete mechanisms of the functioning of social capital (such as diffusion of norms and patterns of opinion leadership on the local scene).

The strength of philo ties: A model of within-groups social capital

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Roberts Wesleyan College

Social capital, especially at the organizational level, has the promise to become an important theoretical frame for academic research and organizational practice. But for organizational-level social capital to fulfill this promise, much

more progress needs to be made in operationalizing the construct. In the paper, I will offer a framework that first (1) develops empirical indicators of social capital among members of a small group and then (2) connects what is called within-groups social capital with organizational-level social capital. Krackhardt's (1992) discussion of philos relationships--in which social actors A and B have interaction, affection, and a relationship that has lasted over time--will be used to frame the argument that network closure is most important as a foundation for both within-groups social capital and organizational social capital, although this claim must be made cautiously in light of likely contingency factors that affect the social capital-related value of both network closure and brokerage opportunities.

The Network Structure of Social Capital

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Although there is wide consensus among social scientists on the meaning of social capital, there exist a number of alternative theoretical arguments on how social capital is generated. Three theoretical lines of explanation stand out in the current debate. The closure argument posits that actors' social capital is associated with the density of the networks in which actors are embedded, and ascribes the generation of social capital to the emergence of obligations, to faster rates of circulation of information, and to the effectiveness of social control. The brokerage argument posits that actors' social capital is associated with the amount of structural holes actors span, and ascribes the generation of social capital to information variety and bargaining power. The status argument posits that actors' social capital is associated with their position in the status hierarchy, and ascribes the generation of social capital to the signaling effect of status position.

This working paper sketches a theory of social capital that brings all three lines of explanation together in a unitary explanatory model, in which social clusters are conceived as the intersection of role and status equivalence, and the relationship between relational and positional embeddedness becomes crucial.

The Gender of Social Capital

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We have made great advances by investigating social capital in the sense of the occupational variety in a person's network. But the variety of contacts with men should have different outcomes than the variety of contacts with women, given the persistence of gender differences in our societies. This paper will develop theoretical predictions for differences in occupational, cultural, political, and health outcomes, and will present a research instrument developed to test these ideas.

Dimensions in individuals' social capital

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Although over the years several valuable measures of individual social capital have been applied, these measures and the corresponding questionnaire items have not been subjected to extensive analyses of their scaling properties. Such analyses can be useful, however, because there may be additional information hidden in the population-specific association patterns of the items and because well-constructed scales can be helpful in obtaining generalizable research results. These association patterns form an interesting feature of social capital in view of the potential mobilisation of social capital: given limited time and human resources available to individuals, low correlations between social resource items would imply a greater difficulty for

individuals in accessing their social capital in general. Hence, low correlation patterns can overall be expected to be a signal of greater difficulty in individual goal achievement using social capital. In this paper we explore and discuss association patterns between social capital items for the Dutch population. In a nationally representative sample (N=935) of the 1999-2000 Social Survey on the Networks of the Dutch, non-parametric scale analyses were performed on data retrieved with items constructed along the idea of the 'position generator' (Lin and Dumin, 1986). Results suggest the presence of a bipolar dimension largely coinciding with social network members' occupational prestige. In addition there is also some evidence that there may be independent cumulative dimensions of intellectual, financial, and practical social resources. These results may lead to scales for individuals' social capital with better generalizability properties and, in addition, they may form a confirmation of Bourdieu's supposition of separate cultural and financial social resources.

Social Capital and Market Adaptation in Slovenia

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INSEAD

Andrej Rus
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This paper analyses how the social capital of the CEOs of Slovenian firms affected their ability to reorient sales after the crisis brought about by the separation from former Yugoslavia in 1991. This crisis caused a drop in sales estimated between 25% and 33%, which was a major shock for an economy where more than 60% of the GDP was linked to trade. Yet, there was wide variation in the firm's ability to respond to this crisis. Using a representative sample of Slovenian firms, and controlling for both exposure to the Yugoslavian market and existing links to the Western markets in 1990, we show that firms whose CEOs could count on a cohesive top management team did better at recovering from the Yugoslavian shock, often maintaining or even increasing their total sales between 1990 and 1993. However, excessive closeness between the CEO and his top management team had a negative influence on sales performance. Our results suggest that while effective leadership may require a cohesive core of followers to mobilize the organization, it also requires that the leader can keep enough distance from that core to perform an effective brokerage role between the firm and the environment.

Social Capital and employment opportunities

Andromachi Hadjiyanni
National Centre for Social Research

The importance of social capital in finding job placements has already been stressed by a number of studies. The particular way and the extent of the utilisation of social capital, seem to be differentiated according to different social formation, influenced by factors such as concepts, opinions, social practices, tradition etc.

A recent survey conducted by our research team in Greece, was aiming to investigate the procedures of the integration of graduates to labour market and the role of the social capital and social networks in finding job placements. Information collected for 620 Social Sciences graduates; 500 in Athens and 120 in other urban areas. The findings of this survey provided empirical evidence on the importance of social relations-networks in accessing to labour market, something that was already a "common sense" in Greece and has reported in a number of studies. The most surprising findings was first, the emphasis on general social networks, than family networks, for finding the first job and second, the use of non-formal ways of finding job placements (family and social networks) even several years after their integration to the labour market and often after having change several jobs.

*Political Capital as Social Capital:
The Evolution of Influence in a Political Network*

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Michael K. Orbach
Duke University

Actors involved in political networks commonly use the term political capital in everyday discourse. More than in probably any other social context, politics involves a conscious awareness of network connections and how they can be used and manipulated to achieve political ends. Political actors frequently speak of 'using up capital', 'spending capital in foolish ways', and the outright exchange of capital. Such capital is manifested in the network of social and political relations and it is understood that success in politics is difficult to achieve without thorough knowledge of the political landscape. This paper follows a political network in North Carolina over a 6-year period, examining individual variation in reputed political influence as it relates to various kinds of network centrality, structural holes, cognitive knowledge of the network, and political outcomes at three points in time. Included are legislators, lobbyists, state government officials, and activists. The study finds that knowledge of the network is particularly advantageous during times of political instability and that influence in the political network is clearly related at all points in time to an actor's ability to broker (betweenness centrality) among the various political players.

Globalization, Informal Economy and Social Networks

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This paper will relate different manifestations of the informal economy (non-regulated, illegal and criminal activities), with formal institutions of society (State and regulated markets) and the interpersonal informal networks through which informal exchanges are realized. International global agencies have produced for the first time reliable information on levels of poverty in the world today, and on the dramatic increase of the informal economy in different socio-political systems (advanced capitalist, developing capitalist, communist and post-communist). Informal economic activities have been defined as those which escape State regulation both on production and distribution of goods and services and on the nature of their final goal (illegal or criminal). Informal exchanges are possible through networks based on cultural institutions of the societies where the exchanges take place, such as family, friendship and all other relations which allow the construction of social networks in which trust and loyalty among its members ensure the functional survival of informal groups. I will use ethnographic examples of studies made in the above listed types of societies showing the relationship between regulations which define formality and informal exchange networks geared towards satisfying social needs which the formal system is unable or unwilling to do. Therefore, a parallel economic sphere results from regulation and control.

An Empirical Study on the Social Capital of Networks

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Gender Differences in Workplace Authority? Social resources embedded in personal relationships (i.e., information, practical assistance and socio-emotional support) can be used in accomplishing workplace authority. In this study gender differences in supervisory, sanctioning, and decision-making responsibilities are explored, and related to differences in the social structure and/or relational content of

personal relationships at work. People's shortage of resources, as a function of their social network, could keep them from jobs at higher responsibility levels (i.e., the 'capital deficit hypothesis'). On the other hand, men and women with equal qualifications and equal amounts of social resources, may not experience equal return benefits from their networks (i.e., the 'return deficit hypothesis').

Therefore, next to the main focus of social networks as explanatory mechanism for workplace authority, various micro- and macro-dynamic influences are examined not only directly, but also indirectly through their impact on (access and benefits) of social networks. Benefits and constraints of male and female workers' social activities are incorporated to the theoretical model of Social Production Functions (SPF) theory (Lindenberg, 1996). Data is collected with 450 employees of a Dutch firm. Since the study is currently in progress empirical results are as yet unavailable. The theoretical framework of the study is discussed.

Social networks and enterprise clustering

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The paper explores the nature of social networks of small and medium size enterprise owners, in the context of an industrial cluster. In the discussion about industrial districts, it is supposed that trust is an essential component of dynamic production networks: Research made recently in a Mexican apparel industry cluster, where more than 300 small and medium size producers can be found, shows that the industrial (organizational) network and the social owner's (personal) network are very different.

In other words, evidence suggest that owners tend to establish production or commercial relationships with people which is not very close in their social networks, and to minimize the apparently effective social capital available in other producers, specifically friends and relatives.

In the article, Social Network Analysis is used to prove how the industrial agglomeration, without solid trust-based social networks, is not a warranty of entrepreneurial success by itself; even though trust is a necessary condition for the cluster generation.

Participation in Voluntary Associations as Social Capital: A Reconceptualization

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One of the fastest growing and yet controversial areas of social capital research is the linkage between participation in voluntary organizations and social capital. In this research enterprise, social capital is assessed through data collected on memberships and participation rates in voluntary organizations. Despite the promise of this approach, the field has suffered from equivocal findings. Beyond the descriptive trend analysis, there is little systematic evidence as to the extent that participation in voluntary organizations is indeed associated with other indicators of social capital or exerts expected returns. We argue that the basic assumption held previously about the necessary condition of dense or closed networks can be flawed. Instead, we must consider the proposition that sparse and open networks may be richer in embedded resources. Conceptual development and empirical evidence have lent support to the linkage between sparse and open networks and embedded resources and instrumental returns, for example, in socioeconomic statuses. Following this line of analysis, one would expect that participation in organizations more heterogeneous in member characteristics would be more beneficial to both participants and the organizations than in organizations more homogeneous in such characteristics. We therefore hypothesize that participation in cosmopolitan organizations rather than local organizations are more beneficial to the participants and the organizations. Data from a survey

study in Taiwan and from secondary analyses of the GSS survey data seem to support this hypothesis. We will extend this proposal to consider expressive as well as instrumental outcomes and for collective as well as individual entities.

Social Capital in Spain: The Emergence of a New Form of Stratification and Action

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Using several national surveys (CIRES, CIS, World Value Survey) we undertake an assesment of social capital in Spain looking at both individual and collective forms of it. Our first objective is to analyze the distribution of social capital among social groups as well as between regions. We will then study its impact on several indicators of well-being and collective action. We will conclude looking into the relation between social participation in civil organizations and trust in social institutions and the state.

Social Resources, Modernization and Occupational Attainment

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Henk Flap
Utrecht University

Differential access to social resources has been suggested as an explanation why with ongoing modernization social origin still affects a person's educational and occupational chances and why a person's education does not have a larger and growing effect on his or her occupational attainment.

We analyse data from the Dutch Telepanel Survey from 1992/93 among 1900 households in the Netherlands. To measure social capital we use the position generator (Lin & Dumin 1986) and other positional measures. Our research establishes, first, that family ties provide better access to social resources than friends but less so than acquaintances. Secondly, family of origin, i.e., father's prestige, does affect access to social resources to a larger degree than a person's own education. Thirdly, analysing the role of access to social resources in the attainment process learns, while looking at the prestige of one's parents best friends when one was young and the prestige of one's current best friends, that there is a shift from achieved to ascribed social capital. Fourth, those who have ever unsuccessfully applied seem to be more successful in the rest of their lives, yet, and finally, using social resources is not a route for people with no other resources, since there a no clear differences between those who ever unsuccessfully applied for a job through formal means and those who ever unsuccessfully applied through informal means.

Technocrats from China: Entrepreneurship and Social Capital in a Strange Land

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New skilled immigrants have a hard time getting jobs. Some urge professional and technical immigrants to give up efforts to break into the local work force and start a business. How they can do so is a big question. Looking at educated PRC immigrants to Canada, we develop a model to explain the conditions under which these men and women, so talented and in demand in China, might be able to avoid under employment by setting up their own businesses. We find

that their education brings the newcomer to the shores. But their human capital, was dynamically interrelated with organizational needs of large complex bureaucracies. Once in Canada, their human capital is not appreciated. Further, their social capital is impoverished. Few can start up flourishing enterprises abroad. Without social capital, skilled immigrants are not prime candidates for entrepreneurship.

Network Dependent Path Dependence

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In sociology path dependence is "the consequence of small events and chance circumstances (which) determine solutions that, once prevail, lead to a particular path". (North 1990 p. 94). In the literature of transitology the emphasis is on the legacy of communism. My addition to this approach is the following: I assume that communism in general and the mature phase of it in particular was (partly due to structural reasons, partly due to historical coincidence) a network dense society (Sik 1994). Partly since post-communism unavoidably used the brickolage of communist institutions (Stark 1995), partly since networks by definitions are high-inertia institutions the post communist path was cobbled with network-fragments (from the size of pebbles to huge marble pieces).

The network-dependent path of the transformation of the communist economy was further strengthened (the more intensive the traffic on this path is, the more likely the path widens into a highway due to the mutually re-inforcing interests of and consequently of the long-term investments of all actors on the road) by the temporary weakening of alternative institutions (such as the state, the internal market, etc.). But what was really important in strengthening the network dependent nature of the transformation process, there were certain transformation-specific processes, which by their immanent characteristics were network-dependent. Such processes were the privatisation, the restitution, the emergence of the multitude of new entrepreneurs, the appearance of multinational business, the opening of the border and last but not least the increasing risks of various economic actors in the course of "transformation crisis" (such as unemployment and decreasing real wages for the average households, the total collapse of the economic viability for certain ethnic groups and regions, the increasing rate of criminality, etc.).

The ultimate question is whether a network dependent country can or cannot leave its path? Can deeply socialised networking practices of the everyday life be abandoned? Could economic actors with vested interests in maintaing utilitaristic (corruptive, barter, etc.) networks be encouraged to disclaim these assets? Can institutions embedded into a network-intensive culture disembed themselves (or being forced or encouraged) from it? My tentative answer is no, no, no, and no, respectively. The explanation follows the convincing arguments of Gerschenkron (1962) on institution specific nature of economic backwardness. I assume that just as the state substituted the colonial wealth and the banking system in the process of "original accumulation of capital" in backward economies, the network capital plays the same role in post-communist tranformation. This is the only resource these economies have in plenty consequently they cannot afford to use it. And since it is very unlikely that they ever reach the stage of economic development they could afford to rely less on network capital, and even if it were to happen they could not undo their path dependent network capital and the institutional environment it creates for itself - the network dependent path survives.

The Social Capital of Brokerageroles

Volker Taeube

SIDOS

This study shifts interest on the relational characteristics of persons that can be regarded as intermediants (brokers) between different network sectors. Using the terms of „locals" and „cosmopolitans" Merton (1968) pointed out the importance of such roles for explaining structural outcomes. While discussing the theoretical properties of different brokerages Gould and Fernandez (1989) referred to the idea of persons as social transmitters in a more non-formal way.

By trying to grasp these concepts in the framework of Hummell and Sodeur's (1987; see also Burt, 1990) work on the census of triadic role patterns, the measurement of different amounts of social capital associated with brokers becomes possible. In general, two classes of brokerages can be distinguished: on one side „locals" are playing a role within dense network sectors such as cliques while on the other side „cosmopolitans" reside in more sparsely connected network sectors which allow the connection between otherwise separated cliques. Whereas the former are decisive for ingroup communication („ingroup leaders"), the latter connect (as more „formal leaders") ingroup leaders indirectly and allow thus for exchange of scarce resources (i.e. information about job opportunities). Due to the greater opportunities in accumulating social capital several cosmopolitan roles with differing status seem possible. Depending on the offer of scarce resources in a social network integration processes occur that bring about changes in the status of the cosmopolitans.

Social capital and economic reform in East-Central European transition countries

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Some economists have hypothesised that social capital can benefit economic reform in post-communist countries by introducing greater trust in institutions and in the surrounding society, leading to more stable patterns of development. The paper will consider the relationship between participation in civil society, trust in institutions and in society and patterns of economic and political reform in Eastern and Central Europe in comparative perspective drawing upon the World Values Survey and the New Democracies Barometer.

Social Networking of Entrepreneurs and Spatial Location of Firms as Success Factors of High-Tech Firms in Israel

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The research is a Ph.D. thesis at the Technion-Israel Institute of Technology, Faculty of Architecture and Town Planning.

The thesis is a quantity, quality and ethnographic research of the influences of entrepreneurs social networking and spatial location of high-tech firms on the company first stage at the northern region of Israel.

Sixty one entrepreneurs were interviewed with a half-open questioner. The sample was created through the snowballing method. At the end of the interviews round the sample members were asked to check on a list the names of all those that they knew from their social, academic, military and professional past. Everybody returned the list.

There is a high level of correlation between the network variables such as Freeman's Degree Centrality and Bonacich Power, spatial location variables, background and social variables and the economic success of the high-tech firms. Economic success is defined by number of workers, the ability to raise funds and market value of the firms. Data was collected during the interviews.

One hypothesis suggests that there is a competitive advantage on the especially cohesive social web and social networks of the Israeli society, which enhance and promote the creation of high-tech firms. These social networks are developed from a peculiar cultural cooperation and trust tradition based on the same personal backgrounds (especially at the army). Therefore the hypothesis that successful entrepreneurs are the most socially networked ones is approved.

The other hypothesis suggests that there is a correlation between the spatial location of the firm at the regional level and the firm's success. This last hypothesis was also approved. Firms from one strategically located town (Yokneam) are much more successful by a high percentage than firms in all the other towns and cities of the northern region of Israel. Therefore Yokneam is called the Silicon Waddi of northern Israel.

The research emphasizes the importance of the entrepreneurs social network, and the spatial location of the firm as very influential factors on the founding process and success of high tech firms as promoters of economical growth and social development in Israel.

Informal Relations at Work

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After having described the informal networks at work four theories are tested. These are theories on emotional attraction between similar people, effects of restrictions, networks as social capital, and conflicts of interests between management and employees. We conducted a representative Survey of the Social Networks of the Dutch (SSND) among 1003 persons, while we over-sampled employed persons. In total 728 respondents do have a job. Colleagues are important in work related matters, but not for other things. People seldom turn to family, friends and neighbours in work related matters. Colleagues sometimes discuss their personal problems, though usually co-worker ties are weak.

Once more it is shown that people are attracted to similar others, also at work: being of the same age or sex promotes the emergence of mutual ties. As to restrictions: meeting chances stimulate contacts at work. Yet, those who have a part-time job demonstrate more social activities at the job. Time pressure because being married or having young children at home does lead to less contact with direct colleagues. As expected, functional interdependencies at the work and good relations among one's colleagues have a positive influence on one's own informal ties to colleagues. Conditions that make a person more attractive as a social resource, like having a higher education or a shared future, also enhance informal relations between co-workers. Women in spite that they seem to have a choice in life to be worker or a 'homemaker', do not have fewer or less good relations at work. Finally, in contrast to Marxist ideas good relations with the boss are associated with good relations to co-workers.

Network Effects on Family Formation: Why are African Americans less likely to Marry

Yoosik Youm
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African Americans' low marriage rate has not been successfully explained by studies focusing on sex ratio. In the present study, however, a game theoretic model of sexual matching market is developed where the equilibria of the game is contingent on the trust level of the couples, which is measured by structural embeddedness. A relatively high proportion of polygyny as one of the sexual matching market equilibria in the African American population aggravates the sex ratio effect: men with low trust are nine times more likely to be unmarried and African American men are so signifi-

cantly more likely to have low trust level that racial/ethnic difference becomes insignificant after controlling for the trust level. This explains why the marriage rate is lower than expected from the sole sex ratio explanations because unmarried single people in polygamous relationship are much less likely to marry: even if two populations have the same sex-ratio, a population with higher polygamous relationship is more likely to have a low marriage rate.

The effect of trust is empirically tested in an event history analysis using the Chicago Health and Social Life Survey, a representative sample of Chicago (n=890): relationship with high trust level is 7 times more likely to end up with marriage for men. In sum, African Americans are less likely to marry because they have a relatively high proportion of polygynous relationships as equilibrium in the sexual matching market due to the lack of trust as a social capital measured by structural embeddedness, which makes marriage implausible in many circumstances.

Social Support

Ayala M. Pines

Homelessness in Hungary from a Network Perspective Institute for Sociology of the Hungarian Academy of Sciences

Fruzsina Albert and Beata David
Institute for Sociology of the Hungarian Academy of Sciences

We would like to present our results supporting the outstanding importance of the presence or lack of interpersonal ties in the multi-causal process of becoming homeless. We analysed data of app. 2200 homeless persons from Budapest who participated at a tuberculosis screening program in 1997. We view homelessness as a system of deprived statuses, and hypothesise that within the stratum put at risk by various, often interrelated factors (lack of housing, employment, economic recession etc.), the lack of personal supportive relations is the most significant one in determining whether a person actually becomes homeless or not.

To support the highlighted importance of the lack of supportive personal relations, we compared the homeless population to other non-homeless populations who are characterised by deprivations otherwise characteristic of the homeless as well: those without housing, the unemployed and the very poor. The homeless are very different from these groups in one respect: they lack strong, mostly family-based social networks.

Traditional support systems: Are they sufficient in a culturally diverse academic environment?

Adital Ben-Ari
University of Haifa

The present study explores the relationship between perceived social support and well-being among students of the three main populations living in Israel: Israeli-born Jews, Israeli-born Arabs, and Russian immigrants. More specifically, it examines to what extent perceived social support actually contributes to their well-being. The sample was comprised of 278 undergraduate students in the schools of social work and nursing at one of the major universities in Israel. Findings show that the Arab students are significantly more distressed than their Jewish and Russian counterparts on all measures of well-being. At the same time, their perceived social support is significantly higher than that of the Jewish students (both Israeli-born Jews and Russian immigrants).

Social Support Networks and People's Level of Web Use

Eszter Hargittai
Princeton University

This paper looks at the importance of social support networks in how people use the World Wide Web. An increasing body of literature documents inequalities in people's access to and use of the Internet.

Most of this work has focused on people's individual attributes - education, income, race, gender and others - in explaining differences in use of the medium. This paper argues that information about one's social support network is also important to the puzzle of why people's use of the Internet differs. As use of the medium diffuses to an increasing portion of the population, it is necessary to start distinguishing between levels of skill exhibited by different users to understand where the real inequality in access to the medium lies. This paper draws on data about how a random sample of Internet users locates content online to discuss how access to social support networks may affect people's Web use skills.

I Keep to Myself, But...: Impediments and Catalysts to Information Flow and Social Support within Homeless Populations

Julie Hersberger
University of North Carolina at Greensboro

Karen Pettigrew
University of Washington

Social support, in its varied interpersonal and institutional forms, can greatly help with problems of daily living, particularly for homeless populations whose needs are considered acute. Our study examines homeless parents residing in shelters in North Carolina and Washington State. Using in-depth interviews and semi-structured observation, we focused on participants' relationships with network members and how they sought information about social support. In this paper we discuss: (1) how small, sparsely knit networks and the isolation of individuals impeded information-seeking, (2) how particular network members, e.g., shelter staff, social workers, church employees, facilitated information flow because they exhibited attributes of both weak and strong ties (i.e., dual tie strength), (3) how the findings expand on Chatman's information poverty, and (4) methodological concerns with identifying participants and constructing instruments using qualitative techniques.

Personal Support Networks of the Residents of the City of Ljubljana

Tina Kogovsek, Valentina Hlebec, Anuska Ferligoj
University of Ljubljana, Slovenia

Many studies (e.g., Weiss, 1974; Hirsch, 1980; Wills, 1985; an overview in Vaux, 1988) show that social support is a multidimensional concept. It can be subdivided into four major dimensions: instrumental support, informational support, emotional support, and social companionship. In the paper, the personal support networks of the residents of Ljubljana, the capital of Slovenia, are described. The data were collected in the year 2000 by telephone interview on a random sample of 1033 residents of Ljubljana. The preliminary results confirm some findings of the earlier similar studies (e.g., Fischer, 1982; Marsden, 1987; Iglic, 1988a, 1988b; van der Poel, 1993; Schweizer et al., 1998). Also some new and interesting results were obtained.

The Characteristics of the Interhousehold Transactions in Hungary in the Mid Eighties and the Late Nineties

Janos Bocz and Istvan Harcsa
Hungarian Central Statistical Office

Through the use of two surveys the lecture will present the frequency of the interhousehold transactions in Hungary, the types of these supports and the characteristics of those households who take part in the supporting system and who does not. The empirical data are based on two living conditions and time use surveys, which were carried out by the Hungarian Statistical Office in 1986 and 1999/2000, respectively. The samples included more than 10 thousand households and the comprehensive analysis of the results make possible to demonstrate the structural changes having taken place since the mid 80s.

In our lecture we will analyse the composition of the households supporting each other, the types of the households co-operation (in terms of supports in cash and or in kind), the differences in demographic features between those households, who get and those who give supports. We would present whether there is any connection between the household's network and the households taking part of the supporting system or not. Our presentation can also demonstrate what was the difference in terms of income level and property situations between supporting and supported households, and who gave and what type of supports was given in the mid 80s and the late 90s.

Network Composition and Network Structure in Secondary Education

Miranda Lubbers
Groningen Institute for Educational Research,
University of Groningen

This paper describes how the structure of social relationships between pupils in secondary education is affected by the group composition of school classes. The results are part of an empirical study, which describes the class as a social environment and its impact on educational performance. For this aim, sociometric data have been collected as an addition to a large-scale longitudinal study on secondary education in the Netherlands. The study started in 1999. All pupils (average age 13) who were then in the first grade of a sample of 139 schools belong to the cohort; this amounts to about 20,000 pupils in 800 classes. The size of this sample allows us to investigate how friendship and co-operation choices within classes are affected by both the individual social background and the composition of the class as a whole (e.g. with respect to ethnicity, SES and educational performance at the entry to the school). We could hypothesise, for example, that two classmates, both belonging to ethnic minorities, are more likely to have a friendship tie in a predominantly Dutch class than in an ethnically more heterogeneous class. Some preliminary results of the first school year will be presented.

The Functions and Utilization of Social Support: An Israeli- Chinese Comparison

Ayala M. Pines, Nurit Zaidman
Ben Gurion University
Yihua Wang, Han Chengbing, Lu Ping
Rrenmin University

The need for social support is universal but the way it is utilized is culturally determined. These two assumptions were tested in an exploratory study of the functions and utilization of social support in Israel and China. To assure similar samples (in terms of such demographics as age and education) data was collected from students who were asked whom they would turn to (a family member, a friend, an agency etc.) with various problems (an emotional problem, a financial problem etc.) They were also asked to rate the importance of various support functions (emotional support, technical support etc.) and to indicate how available are those support functions to them. It was hypothesized, based on knowledge of the two cultures and previous

research, that while both Israelis and Chinese view the various functions of social support as important and while help seeking is influenced by the type of problem, they utilize their social support differently. Findings supported these predictions. The cultural differences found can be explained by the very different size of the two counties and their very different attitudes towards the individual vs. the community. These preliminary findings demonstrate the importance of cross-cultural research on the utilization of social support.

Classroom role and school adjustment

Ronan Van Rossem and Marjolijn Vermande
Utrecht University

In the literature a child's peer relations in school are considered important not only for a child's school adjustment but also for his or her future development. This paper examines how a child's role within the informal structure of a classroom affects his or her school adjustment, not only in terms of academic achievement but also in terms of behavioral problems and feelings of loneliness. Data on the classroom social networks (both positive and negative) of 1241 first grade children in 71 classes were collected. Triad-based blockmodeling was used to identify informal social roles within the classroom. Nine different social roles were distinguished: average-weak, average- strong, leaders, bullies, mild bullies, good kids, nice kids, isolates, and followers. Classroom roles were only weakly associated with some characteristics of the children (age, intelligence, and sex) while being unrelated to others (attractiveness and ethnic origin). Stronger associations were found between classroom role and the various indicators of school adjustment.

A Social Network Analysis of Undergraduate Students and the Effects of the Social Network upon Their Group Performance

Elaine Scott
City University Business School

The concept of social networks is particularly interesting when it can be linked to a direct impact upon the performance of an organization or system of interest. Measures of performance can be difficult to define and direct links between networking and performance hard to establish. Within the field of education however, performance measures are easily identifiable. Students work within close knit communities striving for the same goal of high grades in individual and group projects. Work carried out in the field of education includes Mehra, Kilduff & Brass (1998) who undertook a social network analysis of MBA students. They concentrated specifically on the distinctiveness approach to social identity and the social networks of under represented groups. They found that there may be advantages as well as disadvantages to marginality in informal networks as this can form a basis for shared identity, social support and interaction. Baldwin, Bedell & Johnson (1997) also investigated the social fabric of an MBA program. They looked at the network effects on student satisfaction and performance. The MBA students studied by Baldwin, Bedell & Johnson were formally assigned to permanent groups for the entire program. Subsequently they hypothesized that "It may be that ongoing permanent team assignments actually hinder the widespread development of broader-reaching informal networks in educational programs."

This study will comprise of a social network analysis of three cohorts (years 1, 2 & 3) of an undergraduate degree program, measuring friendship and communication networks and the effects of such networks upon group performance. The main aim of the study will be to establish the link between individual friendship and communication networking and enhanced group performance and will also attempt to address the following gaps in the literature:

C To test the difference between permanent and non-permanent group assignments

C To test the difference between enforced and voluntary group assignment.

CCarry out the study using undergraduates. (Undergraduates have had less pre-socialization into the benefits of networking than MBA students and are less likely to carry out the behavior purposefully, but rather the networks will develop naturally over the course of the three years.)

CComparison of students throughout the three years of the degree program. How does the socialization and normalization process affect the social and communication networks and what are the subsequent effects upon group performance?

C Carry out a peer group assessment study enabling the students to rate each member of the group in terms of effort, intellectual contribution and co-operation with the group.

Through a process of social network analysis and peer-group assessment, the following hypothesis will be tested: Individual friendship and networking behavior produces a positive effect upon contribution to group performance, through the acquisition and appropriation of information, providing advantage to the group through social and intellectual capital.

*Social Solidarity and
Integration in a New Market Economy:
Aspects of Friendships and Emotional Support in
Hungary*

Agnes Etas
University of Szeged

Social solidarity is an important element of social integration. Solidarity and support among different social strata seems especially critical in a society like Hungary, that has gone through a major social and economic revolution and only ten years ago started a market economy. Some of the outcomes associated with the new market economy such as bigger inequality, absence or reeducated government organised social support and unemployment, had a negative impact on social solidarity in Hungary. In previous decades people approached first members of their nuclear family in difficult situations. In the current situation some aspects of the old social structure have disintegrated, but the instrumental cohesion in the nuclear family may possibly be stronger.

The paper addresses the questions: Who among the different social strata have friendship networks, emotional connections, outside their nuclear family? Who do people in different social strata turn to for support when in difficult situations? It describes the different kinds of support utilized in different social strata and in different times in modern day Hungary.

*Social Support of the Elderly People
Using the Security Alarm System*

Valentina Hlebec, Katarina Bitenc, Mateja Nagode,
Anja Pajtler, and Matja Robin
University of Ljubljana, Slovenia

The Center for Help at Home was established in 1992 by the Home for the Aged in Ljubljana. The security alarm system has been a part of their services ever since. This was the first implementation of a special telecommunication system for the elderly in Slovenia. Evaluation of the security alarm system done in 1996 revealed that such a system could not be used widely due to the poor telephone coverage within the aged population and expensive technical equipment and network of home-based services. Further analysis shows that the security alarm system provides only a supplementary source of social support for the elderly. Formal sources of social support are called upon only in the case of unavailable or absent social network of relatives.

Statistical Methods for Social Networks

Tom Snijders

*Eigenvector-like Measures of Centrality for
Asymmetric Relations*

Phillip Bonacich and Paulette Lloyd
University of California at Los Angeles

Eigenvectors of adjacency matrices are useful as measures of centrality or of status. However, they are misapplied to asymmetric networks in which some positions are unchosen. For these networks an alternative measure of centrality is suggested that equals an eigenvector when eigenvectors can be used and provides meaningfully comparable results when they cannot.

*Probability Distributions for Popularity and Expansiveness:
Social Process Versus Personal Attributes*

John P. Boyd
University of California at Irvine

In a directed graph, the relative frequencies of in-degrees and out-degrees are known as popularity and expansiveness, respectively. Unfortunately, some of the more familiar discrete distributions, such as the binomial, Poisson, and negative binomial, have to be rejected by the Ord criterion: the ratio of the second central moment to the first, and the ratio of the third to the second. However, a study of probability distributions that do fit these marginal distributions can shed light on the social process that formed the links. For example, one of the Pólya urn sampling schemes is to replace each ball sampled with c balls of a similar color, producing a negative hypergeometric distribution. When c is positive, then both colors are contagious. In the context of friendship choices, this can lead to a runaway popularity effect. However, the contagion model has, by Gurland's theorem, a dual genesis as a mixture (or stopped-sum) of distributions. We suggest experimental ways to distinguish these two ways of generating the same distribution.

*The Exploratory Statistical Analysis of Networks:
Fixed Choice Scheme*

Ove Frank
Stockholm University
Michael Capobianco
St. John's University

O. Frank and M. F. Capobianco initiated the study of statistical inference in networks in 1969-70. More recently, Capobianco has devoted attention mainly to exploratory analysis. Here, rather than being interested in a specific property of the net, such as its size, or connectedness, we consider only the possibility of learning something about its structure, e.g., is it clustered or widely separated.

We studied, among other more complicated problems, two "choice schemes" namely, the Fixed ("name your three best friends"), and the Variable ("name all your friends"). This paper deals only with the former. It was found that just 10 configurations are possible between any pair of sampled points, and that the distribution of these in the sample yields information about the structure of the population network.

*Centrality Testing and the Distribution of the
Degree Variance in Bernoulli Graphs*

Jan Hagberg
Department of Statistics

Exact and asymptotic distributions of the degree variance

are investigated for Bernoulli graphs and uniform random graphs. In particular the range of values of the degree variance and its maximum value are considered. We show that the degree variance is approximately gamma distributed with parameters obtained from the first two moments of the degree variance.

Since centrality of a graph can be interpreted as a measure of its heterogeneity in terms of vertex degrees, we can perform a centrality test with a critical value obtained from the gamma distribution.

Bayesian Approaches to Social Network Modeling

Ove Frank
Stockholm University

Bayesian statistics derives its models from exchangeability assumptions and other invariance principles that apply to data observed. Social network data present special opportunities for Bayesian approaches. Both measurement models and sampling models for networks could be approached by Bayesian methods. Some examples are discussed in order to demonstrate the potential of this approach and illustrate some alternatives to Holland-Leinhardt models and other log-linear models for social networks. The discussion also provides a way to handle the difficulties involved in evaluating models for which the number of parameters increases with the number of nodes in the network.

Estimating Reliability and Validity of Egocentered Network Measurements

Tina Kogovsek and Anuska Ferligoj
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In the paper the quality of data in terms of reliability and validity of egocentered network measurements is estimated by the multitrait-multimethod (MTMM) approach. This approach usually requires at least three repeated measurements (methods) of the same variable (trait) for model identification purposes. This poses a considerable burden on the respondent and increases the cost of the data collection. A split ballot MTMM design (Saris, 1999) was used, in which separate groups of respondents got different combinations of only two methods. The design can also be regarded as a planned missing data design and the procedures suggested by Allison (1987) are used for maximum likelihood estimation of the confirmatory factor analysis models for MTMM designs specified in Saris and Andrews (1991). The influence of factors, such as methods used and demographic or personal characteristics of respondents, that can affect the quality of data is estimated by the Multiple Classification Analysis. The procedures are applied to social support data collected in the city of Ljubljana (Slovenia) in the year 2000.

Stochastic Actor-oriented Models for Networks of Changing Composition

Mark Huisman
ICS, FPPSW, University of Groningen

Markov chains can be used for the modelling of complex longitudinal social network data. A probability model for the evolution of social networks is the stochastic actor-oriented model for network change proposed by Snijders (1996, 2001). The basic idea for the model is that actors in the model evaluate their position in the network and strive for the 'best' possible configuration of relations. The evaluation of the configuration is defined as a function of the actor's position in the network, and depends on parameters that are estimated from the data by a Markov chain monte carlo procedure.

This paper describes the problem of changing network composition due to actors leaving the network at some time point and new actors joining the network. The actor-oriented model of Snijders is extended to handle longitudinal data in

which the composition of the network and its size change. For that purpose continuous-time Markov chain models are implemented as simulation models in which actors are allowed to leave or enter the network at fixed time points.

Gibbs Regression and Some Tests for Goodness of Fit

Lynne Seymour
University of Georgia

We explore a model for social networks that may be viewed either as a conditional extension of logistic regression or as a Gibbs distribution on a complete graph (a model from particle physics). The model was developed for data from a mental health service system which includes a neighborhood structure on the clients in the system, and models client responses while

assuming that the network bonds between clients always exist (but could perhaps be degenerate). Markov chain Monte Carlo methods are required for fitting the model. We will also present goodness of fit statistics for assessing the fit of this model.

Markov Chain Monte Carlo Estimation of the p^ Model*

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The estimation method which is at this moment usual for the p^* model is a maximum quasi-likelihood procedure which is implemented as a logistic regression method. The statistical properties of this procedure, however, are questionable and not yet completely understood. Maximum likelihood estimation for the p^* model is possible, however, and can be carried out by Markov Chain Monte Carlo. Various implementations are possible in principle and practical difficulties have to be solved to make the algorithm work well.

A method is proposed which uses a Robbins-Monro-type procedure for approximating the solution of the likelihood equations. The p^* model is simulated as the asymptotic distribution of a particular specification of the network evolution model also used in the SIENA program. Examples are given for various triadic p^* models.

Aggregation of Perceived Social Networks

Johan Koskinen
Stockholm University

Measurement accuracy is an inherent problem in social network analysis. The issue of actor accuracy in reporting their interactions with others, was raised by Bernard, Killworth and Sailer (e.g. Bernard et al., 1980, Information accuracy in social network data IV: A comparison of clique-level structure in behavioral and cognitive network data, *Social Networks*, 2:191-218) and provoked extensive debate. Krackhardt (1987, Cognitive social structures, *Social Networks*, 9:109-134) later introduced the concept of Cognitive Social Structures and several methods for aggregating different actor reports on the network into a single graph, with the aid of which actor-actor congruence could be gauged. A statistical model for aggregating separate reports into a single consensus network, with the additional benefit of allowing estimates of actor accuracy to be obtained in the process, was proposed by Batchelder, Kumbasar and Boyd (1997, Consensus analysis of three-way social network data, *Journal of Mathematical Sociology*, 22:29-58). The purpose here is to investigate this approach to the problem in a Bayesian framework. The emphasis is put on the effects of the choices of different distributional assumptions on the ability of the models to capture our prior knowledge and yield estimates of actor "accuracy", the consensus/central graph and, various summary measures.

Bayesian Network Modeling of Block Structures

Christian Tallberg
Stockholm University

A Bayesian approach is taken to model block structures in social networks. In particular, a stochastic block model is considered comprising a block of central actors and a block of non-central actors. Prior probabilities are assigned to the different alternatives for choosing the central block, and posterior probabilities are derived for different possibilities for the central block. Furthermore, posterior probabilities are calculated for the order of the central block. A generalization is also considered where the number of blocks is allowed to be larger than two, and where centrality is extended to other structural properties governed by the edge probabilities within and between the blocks.

Confidence and Complexity in Blockmodel Selection

Christopher Wheat
Harvard University

This paper explores how a Bayesian approach can be used to address the problem of blockmodel selection for social networks. The Minimum Description Length (MDL) principle is used to develop a prior probability distribution for the set of possible blockmodel structures for a given social network. The method presented here can be used not only to determine how actors should be assigned to a given partition of a network into blocks, but also provides a statistical basis for determining how many blocks actors in a given network should be partitioned into.

Furthermore, this method provides a statistical basis for determining confidence intervals for blockmodel parameters. The method developed in this paper is predicated on the existence of a stochastic blockmodel, or a posterior probability distribution for the observation of a set of network ties given a particular blockmodel structure. The stochastic blockmodeling approach presented in this paper represents a generalized model, of which many of the existing stochastic blockmodeling approaches are special cases.