

VITA

PHILLIP F. BONACICH

Personal Data

Born September 4, 1940, Napa, California
Married (1964) to Edna Miller
Two Children: Emma (born 1964) and Jane (born 1967)

Degrees

1962 B.A., Sociology, University of California, Berkeley
1966 M.A., Sociology, Harvard University
1968 Ph.D., Sociology, Harvard University

Research Experience

1968-70 Principal Investigator, "Overlapping Membership Relations between Groups," funded by Department of Health, Education and Welfare, Office of Education.

1969-73 Principal Investigator, "Group Conflict and Group Structure," funded by National Science Foundation.

1975-78 Principal Investigator, "Social Mechanisms for Achieving Cooperation," funded by National Science Foundation.

1976- Co-principal Investigator, "Postdoctoral Program of Advanced Training in Evaluation Research as Applied to Mental Health," funded by National Institute of Mental Health.

1978-82 Principal Investigator, "Family Coalition Structure and Children's Mental Health," funded by National Science Foundation.

1987-89 Principal Investigator, "Communication Networks and Collective Action," funded by National Science Foundation.

1991-92 Principal Investigator, "Game Theory and Exchange Networks - Dissertation Grant," funded by National Science Foundation

1992-94 Principal Investigator, "Game Theory Models of Exchange Networks," funded by National Science Foundation

1995-97 Principal Investigator, "Coalitions in Exchange Networks," funded by the National Science Foundation

1998-00 Co-Principal Investigator, "Research in Strategy and Structure," funded by the National Science Foundation

Academic Experience

1964-65 Teaching Fellow, Harvard University (Introductory Sociology).
1967-73 Acting Assistant Professor and Assistant Professor, University of California, Los Angeles.
1973-80 Associate Professor, University of California, Los Angeles.
1980- Professor, University of California, Los Angeles.
1982-86 Chair, Department of Sociology, University of California, Los Angeles

Professional Memberships

American Sociological Association

Publications

"Putting the dilemma back in the prisoners' dilemma." *The Journal of Conflict Resolution*, 14 (September, 1970), 379-387.

"The development of trust and mistrust in mixed-motive games," with Richard Boyle, *Sociometry*, 33 (June, 1970), 123-239.

"Key variables," with Kenneth Bailey, *Sociological Methodology*, Herbert Costner, ed., San Francisco: Jossey-Bass, 1971, 221-235.

"Factoring and weighing approaches to clique identification," *Journal of Mathematical Sociology*, 2 (January, 1972), 113-120.

"Norms and cohesion as adaptive responses to potential conflict: An experimental study," *Sociometry*, 35 (September, 1972), 357-375.

"Using the sign rule," *Sociological Methods and Research*, 1 (February, 1973), 347-353.

"A technique for analyzing overlapping memberships," *Sociological Methodology*, Herbert Costner, ed., San Francisco: Jossey-Bass, 1972.

"Function specialization and sociometric judgment," with Gordon H. Lewis, *Sociometry*, 36 (March, 1973), 31-41.

"Using assumptions of linearity to establish a metric," *Sociological Methodology*, David Heise, ed., San Francisco: Jossey-Bass, 1975, 230-249.

"Establishing a metric from assumptions about linearity," with Douglas Kirby, *Journal of the American Statistical Association*, 71 (March, 1976), 56-60.

- "Secrecy and solidarity," *Sociometry*, 39 (September, 1976), 200-208.
- "Cooperation and group size in the N-person prisoners' dilemma," with Gerald H. Shure, James P. Kahan, and Robert J. Meeker, *Journal of Conflict Resolution*, 20 (December, 1976), 687-706.
- "Using Boolean algebra to analyze overlapping memberships," *Sociological Methodology*, Karl Schuessler, ed., San Francisco: Jossey-Bass, 1978, 101-115.
- "Laboratory experimentation in sociology," *Annual Review of Sociology*, Ralph Turner, ed., Palo Alto: Annual Reviews, Inc., 1978, 145-170.
- "A single measure for point and interval predictions of coalition theories," *Behavioral Science*, 23 (1979), 85-93.
- "The algebra of blockmodeling," with M. McConaghy, *Sociological Methodology*, Karl Schuessler, ed., San Francisco: Jossey-Bass, 1979, 489-532.
- "The 'common structure semigroup,' a replacement for the Boorman and White' joint reduction'," *American Journal of Sociology*, 86 (July, 1980), 159-166.
- "Palette: a resource-free experimental paradigm for studying coalition formation," with James P. Kahan, *Simulation and Games* 11 (September, 1980), 259-278.
- "Latent classes and group membership," with William Domhoff, *Social Networks*, 3 (1981), 175-96.
- "The common structure graph: common structural features of a set of graphs," *Mathematical Social Sciences*, 2 (1982), 275-88.
- "Representations for homomorphisms," *Social Networks*, 5 (1983), 173-92.
- "Physical contact in the Family," with Oscar Grusky and Mark Peyrot, *Journal of Marriage and the Family*, (August, 1984), 715-23.
- "Family coalitions: A new approach and method," with Oscar Grusky and Mark Peyrot, *Social Psychology Quarterly*, 48 (1985), 42-50.
- "Centrality, dominance, and interorganizational power in a network structure: interlocking directorates among American railroads, 1886-1905," *Journal of Mathematical Sociology*, 12(1986), 127-135.
- "Contributions to churches: a research proposal," in Henk A. M.

Wilke, David Messick, and Christel G. Rutte (eds.),
Experimental Social Dilemmas, Frankfurt: Verlag Peter Lang,
1986.

"Power and centrality: a family of measures," American Journal of
Sociology, 92(1987), 1170-1182.

"Communication networks and collective action," Social Networks,
9(1987), 389-396.

"Group structure and interpersonal conflict in the family," in
Edward J. Lawler and Barry Markovsky (eds.), Advances in
Group Processes, Volume V. 1988.

"Interlocking directorates and communities of interest among
American railroad companies, 1905." with William Roy,
American Sociological Review, 1988

"What is a homomorphism," in L. Freeman, A.K. Romney, and D.R.
White (eds.), Research Methods in Social Network Analysis,
George Mason University Press, 1989.

"Communication dilemmas: simulations involving unequal
knowledge," Connections, 12(1989), 30-37.

"Communication networks and collective action," in Wim Liebrand
et al (eds.), A Social Psychological Approach to Social
Dilemmas, Pergamon Press, 1992, 225-245.

"Communication dilemmas in social networks: an experimental
study," American Sociological Review, 55(1990), 448-459.

"The effects of network density and homogeneity on attitude
polarization," with Elisa Bienenstock and Melvin Oliver,
Social Networks, 12(1990), 153-172.

"Simultaneous group and individual centralities," Social
Networks, 13(1991):155-168

"Some effects of urbanism on Black social networks," with Zhong
Deng, Social Networks, 13(1991), 35-50.

"Power in positively connected exchange networks: a critical
review," in Edward Lawler et al. eds., Advances in Group
Processes, Volume 9, 1992, 21-40.

"The core as a solution to exclusionary exchange
networks," with E.J. Bienenstock, Social Networks,
14(1992):231-243.

"Assignment games, chromatic number, and exchange theory," with
E.J. Bienenstock. Journal of Mathematical Sociology,
17(1993): 243-259.

- "Game theory Models for Exchange Networks: Experimental Results," with E.J. Bienenstock, *Sociological Perspectives*, 36(1993): 117-136.
- "When rationality fails: unstable exchange networks with empty cores," with E.J. Bienenstock. *Rationality and Society*. 7(1995): 293-320.
- "Four kinds of social dilemmas within exchange networks," *Current Research in Social Psychology*, <<http://www.uiowa.edu/~grpproc>> 1:1-7.
- "The coalition structure of the four-person family," *Current Research in Social Psychology*, <<http://www.uiowa.edu/~grpproc>> 1:17-29.
- "Analysis of Discrete Structure: An Overview," *Social Networks*. 18(1996): 315-318.
- "Latent Classes in Exchange Networks: Sets of Positions with Common Interests," with E. J. Bienenstock. *Journal of Mathematical Sociology*, 22(1997):1-28
- "Network Exchange as a Cooperative Game," with E.J. Bienenstock, *Rationality and Society*, 9(1997):37-65.
- "Strategy in exchange networks: exploitation versus accommodation," with E. J. Bienenstock, in Jacek Szmataka, John Skvoretz, and Joseph Berger, eds., *Status, Network, and Structure: Theory Construction and Theory Development*. Stanford: Stanford University Press, 1997, pp. 351-361.
- "Unequally valued Exchange Relations," with Noah Friedkin. *Social Psychology Quarterly* 61(1998):160-171.
- "The Evolutionary Stability of Strategies in Exchange Networks," *Current Research in Social Psychology*, <<http://www.uiowa.edu/~grpproc>> 3:2.
- "A Behavioral Foundation for a Structural Theory of Power in Exchange Networks," *Social Psychology Quarterly*, 61(1998): 185-198.
- "Controlling for Size in Centrality Scores," *Social Networks* 20(1998):135-141.
- "An Algebraic Theory of Strong Power in Negatively Connected Exchange Networks," *Journal of Mathematical Sociology*. 23(1999):203-224. (reprinted and translated in *Sociological Theory and Methods* 18(2003):36-51.
- "Patterns of Coalitions in Exchange Networks: An Experimental Study." *Rationality and Society*. 12(2000):353-373.

- "Eigenvector-like Measures of Centrality for Asymmetric Relations." With Paulette Lloyd. *Social Networks*. 23 (2001):191-201.
- "The Evolution of Exchange Networks: A Simulation Study." *Journal of Social Structure*. 2001
<http://www.heinz.cmu.edu/project/INSNA/joss/index1.html>.
- "The Strength of Weak Power: A Simulation Study of Network Evolution." Pp. 219-243 In *The Growth of Social Knowledge: Theory, Simulation and Empirical Research in Group Processes*, Jacek Smatka, Michael Lovaglia, and Kinga Wysienska, eds. Westport, Conn: Praeger, 2002.
- "Asymptotics Of A Matrix-Valued Chain Arising In Sociology," with Thomas Liggett. *Stochastic Processes and Their Applications* Stoch. Proc. Appl. 104(2003), 155-171.
- "Cellular Automata for the Network Researcher," *Journal of Mathematical Sociology*, 104(2003):155-171.
- "Network Exchange as a Cooperative Game." With Elisa Jayne Bienenstock. Pp. 429-452 in *Networks and Groups: Models of Strategic Formation*, Bhaskar Dutta and Mathew O. Jackson, eds. New York: Springer. 2003.
- "Balancing Efficiency and Vulnerability in Social Networks," with Elisa Jayne Bienenstock. Pp. 253-264 in *Dynamic Social Network Modeling and Analysis: Workshop Summary and Papers*. Ronald Breiger, Kathleen Carley, and Philippa Pattison, eds. Washington .C. The National Academies Press. 2003.
- "Hyper-edges and Multidimensional Centrality," with Annie Cody Holdren and Michael Johnston. *Social networks*. *Social Networks* 26(2004):189-204.
- "Social Capital in Exchange Networks: A Simulation Study of Network Evolution." In Henk Flap and Beate Volker, eds. *Creation and Returns of Social Capital*. In press.
- "Calculating Status with Negative Relations," with Paulette Lloyd. *Social Networks*. In press.

Book Reviews

- Issard, Walter, et al., *General Theory: Social, Political, Economic and Regional*. Reviewed in *American Sociological Review*, 36 (April, 1971), 335.
- Quade, E.S., and W. I. Boucher, eds. *Systems Analysis and Policy Planning: Applications in Defense*. Reviewed in *American Sociological Review*, 35 (June, 1970), 545-546.

Ofshe, Richard J., ed., Interpersonal Behavior in Small Groups. Reviewed in Contemporary Sociology, 4 (January, 1975), 59.

Axelrod, Robert. The Evaluation of Cooperation. Reviewed in Contemporary Sociology 14 (January, 1985), 9-11.

Cook, Karen. Social exchange Theory. Reviewed in Contemporary Sociology (March, 1989).

Lawler, Edward J. et al, eds. Advances in Group Processes, Volume 10. Reviewed in Contemporary Sociology 23 (December, 1994), 877-79.

Watts, Duncan. Six Degrees: The Science of a Connected Age. Reviewed in Journal of Social Structure.
<http://www.cmu.edu/joss/content/reviews/Bonacich/index.html>

Watts, Duncan J. Six degrees: The Science of a Connected Age and Albert-László Barabási. Linked: The New Science of Networks. Social Networks 26(2004): 285-288.

Communications and Notes

"Associational contiguity," Communication in American Sociological Review, 32 (October, 1967), 813-815.

"Deceiving subjects: the pollution of our environment," letter in The American Sociologist, 5 (February, 1970), 45.

Papers Delivered at Meetings

"Graph theory and overlapping groups in high school social structure," Western Management Science Institute Interdisciplinary Colloquium in Mathematics in the Behavioral Sciences, UCLA. November, 1968.

"Putting the dilemma back in the prisoners' dilemma," Pacific Sociological Association, April, 1969, Seattle, WA.

"A criticism of Deutsch's distinction between cooperative and competitive groups." Pacific Sociological Association, April, 1970, Anaheim, CA.

"Some nonstatistical considerations in theory construction," with Kenneth Bailey, American Sociological Association, September, 1970, Washington, D.C.

"Using the sign rule to make inferences," Pacific Sociological Association, April, 1972, Portland, OR.

"Using the sign rule," American Sociological Association, August, 1972, New Orleans (paper accepted but not delivered).

- "Using assumptions of linearity to establish a metric," American Sociological Association, August, 1974, Montreal, Canada.
- "Using Boolean algebra to analyze overlapping memberships," American Sociological Association, August, 1975, San Francisco.
- "The effects of group size on cooperation," with Gerald H. Shure, James P. Kahan, and Robert J. Meeker, American Sociological Association, August, 1976, New York.
- "Overlapping memberships among clubs and policy groups of the American ruling class: a methodological and empirical contribution to the class hegemony paradigm of power structure," with William Domhoff, American Sociological Association, September, 1977, Chicago.
- "Family coalition structure and children's self-esteem," with Oscar Grusky, International Congress of Child Psychology, July, 1979, Paris, France.
- "The role of children in family coalition structures," with Oscar Grusky, American Sociological Association, August, 1980, New York.
- "The common structure graph," Pacific Sociological Association, March, 1981, Portland, OR.
- "Coalitions in families: a test of some theories," with Oscar Grusky and Mark Peyrot, American Sociological Association, August, 1981, Toronto, Canada.
- "Family composition and family conflict," with O. Grusky and M. Peyrot, American Sociological Association, August, 1981, Toronto, Canada.
- "The common structure graph," University of California at Irvine, School of Social Sciences, Program in Networks, April 17, 1981.
- "Physical contact in the family," with Oscar Grusky and Mark Peyrot, American Sociological Association, September, 1982, San Francisco.
- "Blockmodeling: criticisms and suggestions," Pacific Sociological Association, April, 1983, San Jose.
- "Interlocking directorates and communities of interest among American railroad companies, 1886-1905," with William Roy, Sunbelt Network Conference, February, 1983, San Diego.
- "Church contributions as a public goods problem: A research proposal," Conference on Social Dilemmas, May 1984, University of Groningen.

- "Factoring Semigroups," Analysis of Social Networks Seminar, December 1984, Department of Sociology, University of California, Santa Barbara.
- "Interlocking directorates, communities of interest, and the ownership vs control controversy," February 1985, Sunbelt Social Network Conference, Palm Beach, Florida.
- "Interlocking directorates and communities of interest among American railroad companies, 1886-1905," with William Roy, American Sociological Association, August 1985, Washington, D.C.
- "Communication networks and social dilemmas," First International Conference on Social Dilemmas, Social Justice, and Collective Action, June 1986, Kill Devil Hills, North Carolina.
- "Communication networks and social dilemmas," World Congress of Sociology, August 1986, New Dehli.
- "Utilitarian and affiliative tendencies in family coalition formation," with Mark Peyrot and Oscar Grusky, American Sociological Association, September 1986, New York.
- "Bank centrality in 1905," with William Roy, Sunbelt Social Network Conference, February 1987, Clearwater Beach, Florida.
- "Social dilemmas and communication patterns," Sunbelt Social Network Conference, February 1987, Clearwater Beach, Florida.
- "Communication networks and collective action: some preliminary results," American Sociological Association, September, 1987, Chicago.
- "Simultaneous group and individual measures of centrality in interlocking directorate data," Conference on Interlocking Directorates, Kill Devil Hills, North Carolina.
- "Simultaneous group and individual measures of centrality," Sunbelt Social Network Conference, February 1988, San Diego, California.
- "Communication networks and social dilemmas," Second International Conference on Social Dilemmas, Social Justice, and Collective Action, August 1988, Groningen, The Netherlands.
- "Communication networks and collective action," Southern California Social Network Conference, November 1988, UCLA.

- "Communication dilemmas in social networks: an experimental study," Sunbelt Social Network Conference, February 1989, Tampa, Florida.
- "The effect of network homogeneity and density on political/social attitudes: an extension of Laumann," with Elisa Bienenstock and Melvin Oliver, Sunbelt Social Network Conference, February 1989, Tampa, Florida.
- "The geodesic cube: a 3-dimensional object underlying standard measures of centrality," with Steve Borgatti, Sunbelt Social Network Conference, February 1989, Tampa, Florida.
- "Communication networks and social dilemmas: some recent simulation results," University of California, Santa Barbara Social Network Seminar, April 1989, Santa Barbara.
- "Individual and group measures of centrality," American Sociological Association, August, 1989, San Francisco.
- "Power in exchange networks: a new approach," Sunbelt X International Social Network Conference, February, 1990 Tampa, FL.
- "Communication networks and social dilemmas: recent experimental results," World Congress of Sociology, July, 1990, Madrid
- "Individual and group measures of centrality," World Congress of Sociology, July, 1990, Madrid
- "Power in positively connected exchange networks: a new approach," Sunbelt Social Network Meetings, Tampa, FL, February, 1991
- "Power in positively connected exchange networks: a new approach," West Coast Conference of Small Group Research, San Jose, CA, April, 1991
- "Power in positively connected exchange networks: a new approach," Annual Meeting, Pacific Sociological Association Irvine, CA, April, 1991
- "Assignment games and exchange networks," Sunbelt Social Network Conference, San Diego, CA, February, 1992
- "Assignment games and exchange theory," American Sociological Association, Pittsburgh, PA, August, 1992
- "If Rationality Fails: Exchange Networks without Cores," Sunbelt Social Network Conference, Tampa, FL, February, 1993.
- "Exchange Networks Without Stable Solutions: When Rationality Fails," Third European Conference on Social Network Analysis, Munich, June, 1993.

- "Exchange Networks Without Cores: Does Rationality Fail?"
International Institute of Sociology, Paris, June, 1993
- "Collusion in Exchange Networks," Sunbelt Social Network
Conference, New Orleans, February, 1994
- "A Social Dilemma within an Exchange Network," International
Conference on Social Networks, London, July, 1995
- "A Psychological Basis for a Structural Theory of Power in
Exchange Networks," Sunbelt Social Network Conference,
Charleston SC, February, 1996
- "A Psychological Basis for a Structural Theory of Power in
Exchange Networks: new developments" West Coast Group
Processes Conference. San Jose, CA May, 1996.
- "Macro and Micro Processes in Exchange Networks: Finding the
Missing Link." First International Conference on Theory and
Research in Group Processes. Krakow, Poland. July, 1996.
- "A Psychological Basis for a Structural Theory of Power in
Exchange Networks." American Sociological Association, New
York. August, 1996
- "Power in reciprocal and Negotiated Exchange Networks." Group
Processes research Conference, New York, August, 1996
- "Time as a variable in centrality analysis." International
Sunbelt Social Network Conference. San Diego. Feb. 1997
- "A definition of ESS extended to exchange networks." American
Sociological Association, San Francisco, August, 1998
- "The effects of actor choice on network structure: a cellular
automata approach." International Sunbelt Social Network
Conference, Charleston, SC, Feb. 1999
- "Coalitions in exchange networks." International Sunbelt Social
Network Conference, Charleston, SC, Feb. 1999
- "Coalitions in exchange networks." West Coast Small Groups
Conference, Stanford, May, 1999
- "Equalizing power in exchange networks: the duality of exchange
and coalitions," American Sociological Association, Chicago,
August, 1999
- "The Strength of Weak Power: A simulation Study of Network
Evolution," Conference on "Creation and Returns of Social
Capital," Amsterdam, The Netherlands, December, 1999.
- "Social Capital as a Social Dilemma: A Simulation Study,"

International Sunbelt Social Network Conference, Vancouver, British Columbia, April, 2000

"Simulations and Experiments on the Evolution of Exchange Networks," Group Processes Conference, Washington, DC, August, 2000

"The Strength of Weak Power: Further Results from the Simulation Study of Network Evolution." American Sociological Association, Washington, DC, August, 2000.

"Structural Holes and Social Dilemmas: A Simulation Study." Public Choice Society. San Antonio. March, 2001.

"Hyperedges and Multidimensional Centrality." International Sunbelt Social Network Conference, New Orleans, February, 2002

"Power in Non-negotiated Exchange Networks," The First Lake Arrowhead Conference On Computational Social Science Agent-Based Modeling In The Social Sciences, Lake Arrowhead, CA. May, 2002

"Power in Non-negotiated exchange Networks," Second Joint Japan-North American Conference on Mathematical Sociology, Vancouver, May, 2002

"Power in Non-negotiated Exchange Networks," World Congress of Sociology, Brisbane, Australia, July, 2002

"Balancing Efficiency and Vulnerability in Social Networks," National Academy of sciences/National Research Council Committee on Human Factors Workshop on Dynamic Social Networks. With Elisa Bienenstock. Washington, DC. November 7-9, 2002.

"The Effects Of Negative Relations On Country Centrality In An International Political Network." With Paulette Lloyd. International Social Network Conference. Cancun, Mexico. February 12-16, 2003.

"Reciprocal Exchange Networks: Model and Experiment." International Social Network Conference. Cancun, Mexico. February 12-16, 2003.

"Calculating Status with Negative Relations." Annual Meetings of the American Sociological Association. Atlanta. August, 2003.

"Power in Reciprocal Exchange Networks," Colloquium on "Creation and returns of Social Capital, Royal Netherlands Academy of Arts and Sciences, October, 2003

"Power in Reciprocal Exchange Networks: Models, Simulations, and

experiments." Colloquium, Institute for Mathematical Behavioral Sciences, University of California, Irvine, November, 2003

"Deeper Truths: Two theories with Surprisingly Similar Implications for Network Power." Group Processes Conference, San Francisco, August, 2004.

Professional Activities and Awards

Sociology Review Panel, National Science Foundation (1975-1977).

Associate Editor, Contemporary Sociology (1974-75), American Sociological Review (1975-77), American Journal of Sociology (1975-77, 1996-present).

Occasional reviewer for National Science Foundation, American Journal of Sociology, American Sociological Review, Social Psychology Quarterly, and other journals.

Editorial Board, Journal of Mathematical Sociology

Organizer, session on Mathematical Sociology, 1979 Meeting of American Sociological Association.

Organizer, session on Mathematical Sociology, 1980 Meeting of the Pacific Sociological Association.

Organizer, Session on Centrality, 1986 Sunbelt Network Conference.

Organizer, 1992 Sunbelt Social Network Conference, San Diego, CA, February, 1992

Organizer, West Coast Conference on Small Group Research, Los Angeles, May, 1993

Organizer, Conference on Theory and Research on Group Processes Los Angeles, August, 1994

Council Member, ASA Social Psychology Section, 1996-1999

Board of Directors, International Network for Social Network Analysis, 1996-

Membership Chair, Mathematical Sociology Section, American Sociological Association, 1995-1996

Didactic seminar (with Elisa Bienenstock), "Game Theory in Sociology." Annual meeting of American Sociological Association, Toronto, Aug. 1997

Chair, Mathematical Sociology Section, American Sociological

Association, 1997-98

Secretary-Treasurer, Rational Choice Section, American Sociological Association, 1997-2000

Chair, Rational Choice Section, American Sociological Association, 2000-2001

Chair, Social Psychology Section, American Sociological Association, 2001-2002.

Organizer, Group Processes/Rational Choice Mini-conference, August 2001, Anaheim, CA

Organizer, Session on Rational Choice, American Sociological Association, August 2002, Chicago.

Organizer, Mathematical Sociology/Rationality and Society Mini-Conference, August, 2001, San Francisco.

Award for best recent paper in mathematical sociology, awarded by Mathematical Sociology Section of the American Sociological Association, August, 2001, for paper "A Behavioral Foundation for a Structural Theory of Power in Exchange Networks," Social Psychology Quarterly, 61(1998):185-198.