

APPLICATIONS OF NETWORK MODELS (1986)**[Alvin Wolfe, Anthro, S. Florida]****DESCRIPTION OF COURSE**

The topic in this urban track special topics course is the use of network models in understanding urban organization and other social phenomena. This seminar explores an approach, network analysis, with potentially important application to urban situations. Theoretical and empirical and practical issues will be considered under a number of major headings, including: transaction/relation; modes of transactions; networks of transactions; collecting transactional and network data; networks as sets of links; network structure; network flow; and uses of network models. Students will get some experience in collecting relational data, in computer processing of data, and in applications of such analysis to practical situations.

Requirements

A. Reading will be done from 2 "textbooks" (Burt and Minor 1983; Maguire 1983); materials placed on reserve in the library; the journal SOCIAL NETWORKS, the newsletter CONNECTIONS and a variety of other journals and periodicals. All will read Burt and Minor (1983) and Maguire (1983). Other readings will be selected by each student from among the items referred to under each heading in the attached schedule of topics, with whatever additional items serve the student's purposes.

B. Because network analysis requires electronic computation, it will be necessary for each student to become proficient in the use of the USF mainframe computer, accessing it through terminals using both WYLBUR on the IBM3080 MVS system and VM/CMS on the IBM3033. For the most part, programs and data sets will be supplied by the instructor, but students will often have or collect their own data which they will analyze in the satisfaction of project requirements described below. Programs available include ALSCAL, CATIJ, CENTRL, COMPATH, CREMAT, G3D, ISETSORT, KYST, NETFLOW, ROLEQ, STRUCTURE, and others. Aside from the evaluation of specific projects below, computer proficiency will count for approximately one sixth of the course evaluation. (15 points)

C. From the second week on, each student will come to each seminar meeting with a brief (approx. 200 words) written comment on some point relevant to that week's topic. Comments should make use of both assigned readings and outside readings to which complete citations should be provided if they are not clearly identified in the bibliographies associated with the course as discussed in paragraph A, above.

SCHEDULE**1. Introduction. Overview of network thinking. Introduction to WYLBUR. Assignment of teams.**

d'Abbs 1982, Chap 1. Maguire 1983, Chap 1. Mitchell 1974. Whitten and Wolfe 1973, Wolfe 1982a (Improving Communication among Network Theorists and Practitioners) 1976ms (Network Models in the Social Sciences, Chap 1).

2. Transaction/relation: Elementary structure of actors, actions, resources.

Maguire 1983 Ch 2. Barth 1966, 1981. Blau 1964. Dow 1973. Ekeh 1974. Emerson 1969, 1973, 1976. Foa 1971. Foa and Foa 1974. Gouldner 1958, 1960. Heath 1976. Homans 1971. Lebra 1975. Mauss 1954. Meeker 1971. Nadel 1957. Thibaut and Kelly 1959. Whitten and Whitten 1972. Wolfe 1970, 1971, 1978, 1986ms. Wolfe nd (Codebooks and Instruments for Network Data Collection).

3. Transactions/relations: Modes of transactions. Spheres of transactions.

Maguire 1983, 2. Barth 1981. Bohannan and Dalton 1962, 1965. Boulding and Pfaff 1972. Boulding et al 1973. Ferman 1978. Joy 1967. Meeker 1971. Piore 1971. Wolfe nd (Codebooks and Instruments...).

4. Networks of transactions. Sets of relations at various levels.

Burt and Minor 1983 I (1,2). Willer and Anderson 1981. Bernard, Killworth, and Sailer 1981 (on small world). Emerson 1969, 1973, 1976. Gottlieb 1982 passim.

Project 1. Using as a guide an appropriate codebook or instrument (e.g. from Wolfe's Codebooks and Instruments, on reserve in the library) collect link/relational data on at least two persons or organizations, entering those data as a data set in your WYLBUR library. Model the data set after some of the members in the partitioned data set named DLEABAA.Z.POLINKS.

5. Collecting transactional and network data. Techniques. Accuracy, validity, reliability.

Burt and Minor 1983 I (3-5). Maguire 1983, 1. Bernard, Killworth, and Sailer 1981. Hammer 1984. Knoke and Kuklinski 1982. Wolfe nd (Codebooks and Instruments for Network Data Collection).

Project 2. Using ISETSO, or some other program, sort a data set of link data into at least two useful subsets.

6. Networks as sets of links. Size, density, variety.

Burt and Minor 1983 I (6,7,8). Maguire 1983 2. Wolfe 1970, 1974, 1981, 1982a.

Project 3. Compare two or more sets of network links, making some statement about how they are alike and how they differ. (Use Wolfe 1970 or 1974 as a guide if you like.)

Project 4. Present some data (a small network or part of one) in two formats: as a network graph and as a matrix.

7. Network structure: Connectedness. Centrality. Range. Segregation & Integration.

Burt and Minor 1983 II (9,10). Berkowitz 1982 passim. Freeman 1978, Freeman et al 1980. Smith and Wolfe 1981. Wolfe 1982a, 1983.

Project 5. Using Wolfe's CENTRL program compare some centrality measures of at least two networks.

Project 6. Contrast the density or connectedness of two or more networks.

8. Network structure: Clusters and Hierarchies. Multidimensional Scaling.

Burt and Minor 1983 II (13,14). Berkowitz 1982 passim. Bernard and Killworth 1973. Faust and Romney 1985. Harary and Battel 1981. Marsden and Lin 1982. Killworth and Bernard 1974. Knoke and Kuklinski 1982. Kruskal and Wish 1978. Sailer 1978. Schiffman, Reynolds and Young 1977. Smith and Wolfe 1982. White and Reitz 1983. Wolfe 1982a, 1983, 1984b, 1985, 1986ms.

Project 7. Using Killworth and Bernard's CATIJ program, analyze at least one network so that clusters are exhibited.

Project 8. Using Burt's STRUCTURE program, analyze at least one network so that "structural equivalence" is illustrated.

Project 9. Using White and Reitz's ROLEQ program, analyze at least one network so that "regular role equivalence" is illustrated.

Project 10. Using some symmetrical matrix of distances, run the multidimensional scaling program ALSCAL to produce a two-dimensional presentation of multi-dimensional data.

9. Network flows.

Bazarra and Jarvis 1977. Bernard and Killworth 1978. Burgess 1978. Dunn 1980. Elmaghraby 1970. Ford and Fulkerson 1962. Granovetter 1973. Phillips and Dessouky 1977. Travers and Milgram 1969. Turk 1970. White, Harrison 1973. Wolfe 1977. Zachary 1975, 1977.

Project 11. Using the NETFLOW algorithm through MAGNET, HAIRNET, SIGNET or WOLFNET, illustrate the way a network may have a "minimal cut" which determines the maximum flow through the network.

Project 12, optional. Using some network flow algorithm (cut-search, OKA, PERT etc.), illustrate how network analysis can help in the management of a complex operation.

10. Uses of network models: Personal support systems. Domestic domains.

Maguire 1983, 2-5. Bott 1955, 1971. Fischer 1981. Gottlieb 1981, Part I and passim. Wellman 1982. Wolfe et al 1968. Wolfe and Clark, nd?.

Project Reports: Lifetime network of Howard Hughes. Separated spouses. Networks of the elderly.

11. Uses of network models: Societal, international, supranational domains.

Burt and Minor 1983 II (12,16). Baker and O'Brien 1973. Berkowitz 1982, chs 3,4. Burt 1979. Dunn 1980. Galaskiewicz 1979, 1984. Granovetter 1973, 1982. Greenbaum 1982. Hine 1977. Knoke and Laumann 1982. Laumann, Galaskiewicz, and Marsden 1978. Laumann and Pappi 1973 (in Leinhardt 1977). Levine 1973 (in Leinhardt 1977). Mayer, Adrian 1966. Poggie and Miller 1969. Mintzberg 1979. Mizruchi 1982. Rothman 1980. Shortell 1977. Thompson 1973. Wolfe 1982b(EPPP), 1982d (SOCINT), 1984a(HSIS), 1984b(NMUE), 1985, 1986.

Project Reports: Electronic ethnography. Supranational system. Neighborhood networks. Urban systems.

12. Uses of network models: Work, employment, occupations, careers, professions. Organizational networks.

Baker and O'Brien 1973. Battersby 1970. Bernard and Killworth 1973. Chapple 1971. Burt 1982a. Elmaghraby 1970. Ferman, et al 1978. Granovetter 1974. Gunter 1970. Hoare 1973. Lawrence and Lorsch 1967. Mintzberg 1979. Philips and Dessouky 1977. Rice 1981. Richardson 1974. Rogers 1981. Van Winkle 1979. Wolfe 1973, 1974, 1985.

Project Reports: Job finding. Job satisfaction. Careers. Networks in bureaucratic situations. Professional linkages.

13. Uses of network models: Health and human services.

Maguire 1983 5,6,7. Burgess, John 1978. Collins 1976. Gordon, Edmunson and Bedell 1979. Garrison and Werfel 1977. Gottlieb 1982 passim. Hammer 1963, 1975. Horwitz 1977. Lee 1969. McKinlay 1973. Pattison et al 1979. Salloway 1973, 1974. Sarason 1977. Sokolovsky et al 1978. Tolsdorf 1976. Wolfe 1980a, 1981, 1982a, 1982b, 1982c, 1984, 1985.

Project Reports: Interorganizational linkages. Human Services Information System. Networks and support after crises. Network structure of MADD. Networks of Women's Services.

14. Uses of network models: Therapeutic interventions.

Attneave 1969. Attneave and Speck 1974. Callan et al 1975. Garrison and Howe 1977. Gatti and Colman 1976. Gordon et al 1979. Gottlieb 1982, Ch 8 and passim. Pattison 1977. Pattison et al 1979. Ruevini 1979. Speck and Attneave 1973. Wolfe 1980, 1981, 1982a.

Project Reports: Separated spouses. Community network development. Client tracking and case management.

[Reference list available from the author.]
