

Tadeusz Sozański

THEORY AND EXPERIMENTAL RESEARCH ON EXCHANGE NETWORKS

Academic year 2005/2006: Spring semester

Exchange networks are socioeconomic systems in which actors can gain valued resources by making bilateral agreements between each other, yet, in contrast to free markets, any two actors are allowed to negotiate and conclude transactions provided that their positions in the system are connected by a network line. The *transaction opportunity graph* together with additional structural constraints, such as the *one-exchange rule* permitting each actor to make no more than one deal per negotiation round, generate the power relation which is invoked in turn as a theoretical explanation of an uneven distribution of benefits observed in experimental networks. The aim of this course is to provide a systematic account of network exchange theories and their experimental tests, beginning from classical works through most recent developments. Most attention will be given to mathematical models of network exchange systems and negotiation processes. The author's computer program (NETAID) will be used to analyze simple *one-exchange networks*.

Topics

1. The concept of exchange. Understanding exchange in economy, sociology and social anthropology. The emergence of exchange theorizing in 20th century sociology (Homans 1958, 1961; Blau 1964, 1968; Emerson 1972).
2. The microeconomic model of dyadic exchange (Edgeworth 1881).
3. Market exchange. Interest in and control over events or goods in multi-actor social interaction systems (Coleman 1973, 1990).
4. The beginnings of network exchange theorizing (Emerson, 1972). First experiments on network exchange (Emerson and Cook 1978).
5. The Elementary Theory of social relations (Willer 1981). Three types of social relations: exchange, coercion, and conflict. Game theory approach to dyadic exchange.
6. The Nash bargaining problem and its solutions (Nash 1950, Kalai and Smorodinsky 1975). Resistance theory (Heckathorn 1980, Willer 1981).
7. Graph theory basics. Graph-theoretic Power Index (Markovsky, Willer, and Patton 1988).
8. Unequal vulnerability to exclusion as a source of power (Markovsky, Skvoretz, Willer 1991-1999). Probability power indices.
9. Strong and weak power. The author's solution of the controversy over defining two varieties of exclusionary power.
10. Bargaining models based on balancing resistance (Lovaglia et. al 1995). Predicting reward distribution and location of transactions across the network.
11. The principle of equal dependence. Equilibrium in two dynamical systems associated with an exchange network (Yamagishi and Cook 1992, Sozański 1997).
12. A multiperson game associated with an exchange network (Bienenstock and Bonacich 1992, Sozański 2006).
13. Experimental research on exchange networks. Negotiation protocol. The use of a local computer network (the students will have an opportunity to watch network exchange

experiments in the Group Processes Laboratory).

Readings

- BLAU Peter M. 1968. "Interaction: Social Exchange." Pp. 452–458 in *International Encyclopedia of the Social Sciences*, vol. 7. New York: Macmillan.
- COOK Karen S. and Richard M. EMERSON. 1978. "Power, Equity and Commitment in Exchange Networks." *American Sociological Review* 43: 721–739.
- SOZAŃSKI Tadeusz. 1997. "Toward a formal theory of equilibrium in network exchange systems. Pp. 303–350 in J. Szmataka, J. Skvoretz, and J. Berger (Eds.). *Status, Network, and Structure. Theory Development in Group Processes*. Stanford, CA: Stanford University Press.
- SOZAŃSKI Tadeusz. 2006 "On the Core of Characteristic Function Games Associated with Exchange Networks." *Social Networks* 28, in press.
- SOZAŃSKI Tadeusz. *The Mathematics of Exchange Networks*. Part II: Mathematical Theories of Power in Exchange Networks.
- TURNER Jonathan. 1998. *The Structure of Sociological Theory*. New edition. Belmont, CA: Wadsworth Publishing Co. Part IV: Exchange Theorizing, Chapters: 19 (The Rise of Exchange Theorizing, 249–262), 20 (George C. Homans' Behavioristic Approach, 263–270), 21 (Peter M. Blau's Dialectical Approach, 271–282), 22 (Richard M. Emerson's Exchange Network Approach, 283–290).
- WILLER David (ed.). 1999. *Network Exchange Theory*. Westport, CT-London: Praeger. Chapters: 2 (23–48, "Actors in Relations" by D. Willer), 4 (85–108, "Power Relations in Exchange Networks" by B. Markovsky, D. Willer, and T. Patton), 5 (109–126, "The Discovery of Weak Power" by D. Willer), 7 (155–184, "Negotiated Exchanges in Social Networks" by M.J. Lovaglia, J. Skvoretz, D. Willer, and B. Markovsky).



<http://www.cyf-kr.edu.pl/~ussozans/>