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THE CAREER OF SOCIOMETRY WITHIN SOCIOLOGY*

Sosyometrinin Sosyoloji İçinde Kariyeri

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Abstract

The subject of this paper is to define factors that have effects on change in science. Particularly, change in science with an examination of the career of Sociometry within sociology was studied. The sociology of science and sociology of knowledge perspectives are employed to explore the internal and external factors affecting Sociometry. The results support a number of theoretical conclusions. These are several factors effecting scientific changes and development: intellectual currents, crisis within the science, competition among scientists, schools, and paradigms, funding, innovations in the technology of research, theoretical integration and methodological clarification and advancement.

Keywords: Sociometry, Sociology of Knowledge, Sociology of Science, Moreno, paradigm, changes in science.

Özet

Bu yazının konusu bilimde değişmeye yol açan etmenleri tanımlamaktır. Bu nedenle, Sosyometri örnek alınmış ve konu ile ilgili araştırma yapılmıştır. Bilgi Sosyolojisi ve Bilim Sosyolojisi perspektifleri ile bilimsel değişmeyi etkileyen içsel ve dışsal faktörler analiz edilmiştir. Araştırma sonucu birkaç kuramsal sonucu desteklemiştir. Bilimsel gelişme ve değişmeyi etkileyen faktörler arasında entelektüel akımlar, bilimsel krizler, bilim dalları, akademisyenler ve ekoller arasında yaşanan rekabet, parasal destekler, teknolojik buluşlar, kuramsal birleşmeler ve yöntemsel gelişmeler sayılabilir.

Anahtar kelimleler: Sosyometri, Bilim Sosyolojisi, Bilgi Sosyolojisi, Moreno, paradigma, bilimde değişme.

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1. Introduction

Science is an area of modern culture, where change is very rapid because it continually renews and transforms itself. This study intends to analyze some of the basic dynamics of change of the social sciences by examining the case of Sociometry.

Sociometry is the term coined by Moreno in 1934 and originally developed as part of an approach to interpreting social structure. Sociometry systematizes information from individuals in a group, concerning who prefers to associate with whom in terms of a specified basis or for a given purpose. Its main analytic device is the sociometric test. The number of sociometric choices allowed may be either fixed or not; may be ordered; and may express the strength of ties. Analysis of sociometric data centred on the number of choices received and given, and the resulting point properties, such as stars and isolates receiving many or no choices respectively. The information is drawn as points and lines on a single diagram called the sociogram where individuals receiving most choices are located at the centre and isolates at the periphery. Alternatively, sociometric data may be represented in matrix form. Sociometry has been widely used in education, the military, formal organizations and other small group contexts for understanding clique-structure. At its peak, sociometry used to have its own American Sociological Association sponsored journal, *Sociometry*. After the 1970s sociometry was used less by sociologists. Instead, they preferred social network analysis for reasons that will become clear in the next part of the study.

An analysis was conducted for the journals, which published sociometric research to show the trend in publication of sociometric articles. Thus, the 134 journals were categorized into five groups: major U.S. sociology journals, other U.S. sociology journals, sociometry journals, non-U.S. journals, and non-sociology journals.

1.1. Statement of the Problem

The purpose of this research is to explore sociometry, its relations to other subfields and approaches, and to identify factors that help to explain the 'decline' of sociometry within the sociology. To understand the career of sociometry one needs to examine the nature of the social systems in which it developed, its stages of development and their relation to each other. This research needs to find comprehensive answers to questions such as following: How did cultural (non-scientific) values within the political, economic, and ideological dimensions influence the creation and evolution of sociometry and its methods? What were the connections between economic, technological, and industrial development and the content, methodology, assumptions, and organization of sociometry? What were the causes of variation in sociometric

approaches? How and why did sociometry change? Why has it almost disappeared and/or become integrated with others fields and theories? Lastly, how did different fields and theories subsume it?

In this study it is not possible to fully address each of these questions. My goal is more modest. By examining sociometry's origins, unique methodology and changing status within sociology, I will attempt to give partial answers to at least some of these questions.

1.2. Theoretical Perspectives

Science is usually taken as a unique phenomenon separate from the rest of culture. It is considered to be completely objective and independent of other institutions in social structure. I do not take this perspective. Instead, I will consider science to be a part of socio-cultural systems. Like art, religion, and ideology, it is part of the totality of human culture. Science, as organized knowledge, is socially and culturally constructed in history. Therefore, it is subject to historically defined standards of judgement, and scientific knowledge grows in response to competition among scientific research programs.

In the present study, a combination of sociology of science and sociology of knowledge perspectives is used. These perspectives are interrelated and each partially explains the history of sociometry. It is possible to divide the factors, which have influenced sociometry into two broad categories: internal and external factors. The external factors that lead to changes in sociometry are best explained by using the sociology of science. In fact, these two sets of factors are interrelated and sometimes indistinguishable since they overlap.

Table 1 summarizes classification of factors for analyzing change in science. Both external and internal factors influence the development and decline of scientific perspectives or paradigms. The concept of external factors refers to the institutional, organizational, and technological factors and the concept of internal factors refers to the intellectual currents, interests, competition, etc. within the scientific discipline or sub discipline.

Table 1: **A Classification of Factors for Analysing Change in Science**		
	Internal factors	**External factors**
Sociology of science	Intellectual currents Crisis Competition Interest Theoretical and methodological integration Technological factors	
Sociology of knowledge		Organization factors Institutional factors Technological factors
Note: Technological factors often result from external innovations. As soon as these innovations become available to researchers and begin to modify research problems and processes they become internal factors.		

1.3. Issues for Research

The literature on the sociology of science and the sociology of knowledge suggests a number of issues for this research.

1. Intellectual currents within a scientific discipline may challenge the development of paradigms within subfields and specialties.

2. Crisis within the social sciences results from the perceived need to find new solutions. If a specific approach/paradigm cannot produce a successful solution for the problem then it may fail and be replaced by a more successful competitor.

3. Competition among social scientists, schools, and paradigms for resources such as research funds, prestige and academic recognition may cause changes in the social sciences.

4. Levels of funding and student interest can have important effect on paradigm development.

5. Innovations in the technology of research, for instance, computers, telephone survey, etc., can influence the scientific paradigms and research programs.

6. Theoretical integration causes change in the social sciences because it redefines disciplinary boundaries and research agendas.

7. Methodological clarification and advancement has an impact on paradigms because it changes the way in which scientific problems are addressed.

2. Sociometry

Sociometry is an interdisciplinary approach that combined perspectives drawn from psychology and sociology. Its subject matter was the structure of small groups. This part of the study focuses on the origin, basic concepts, methodology, and assumptions of sociometry, emphasizing the studies of Jacob L. Moreno and his contemporaries.

2.1. Sociometry and Small Group Studies

Group studies are one of the more popular areas within sociology. Social groups are collectivities of individuals who interact and form social relationships. We can classify groups in two categories according to their size and type of relationships. First, there are primary groups that are defined by face-to-face interaction. Primary groups have their own norms of conduct and they are usually characterized by a high level of solidarity. Family, friendship, and work groups are examples of primary groups. The second type is the secondary group. Secondary groups are relatively larger than primary groups and each member does not interact directly with every other. Unions and political parties are examples of secondary groups. In general, small group research is concerned with groups in which the members frequently interact. Howard Taylor (1970) defines a group as "… a unit that consists of two or more persons who interact or communicate, who have orientations toward one or more symbolic objects, and who possess an awareness of a 'we' or membership" (1970: 3). Regarding group membership, he believes that "… each person in group must receive an impression or perception of each other person distinct enough so that he can, at any time, give some reaction or opinion, however minimal, to each of the others as an individual" (1970: 3).

During 1930s, a number of professional specializations and developed for small group research were done. Among these, social work and group psychotherapy were leading examples. The development of business schools and the accompanying growth of human relations and industrial psychology were important in this development. Small group experimental studies developed within education and industry.

In general, there were three major small group approaches. One of these was represented by Elton Mayo and his colleagues' in the business school at Harvard University. Their works were based on the investigation of industrial work groups. Another was Kurt Lewin and his colleagues' studies in experimental psychology. These were mostly interested in leadership. The third approach was sociometry associated with Jacob L. Moreno. Sociometry dealt with the empirical investigation of the structure of social interaction and communication within small groups. Simmel's ideas of reciprocal relations and of the influence of numbers on group life had an influence on small group

studies, especially on sociometry. Moreno and other sociometrists used Simmel's analysis of dyads and triads as the building blocks of social life. Although Simmel was the first researcher who studied these issues, Moreno adopted his idea that the social organization of a community consists of a web of social relations.

2.2. Defining Sociometry

Orhan Hançerlioglu (1987) defines sociometry as experimental and/or applied small group sociology that tried to evaluate individuals according to their place in the group and their relationship with other individuals by numbers and measurable concepts. Moreno's definition of sociometry is not much different from that of Hançerlioglu's; "Sociometry is the mathematical study of psychological properties of populations; the experimental technique of and the results by application of quantitative methods." In addition, "Sociometry is the science of group organizations" (Moreno, 1969: 23). With sociometry, Moreno tried to create a new science. He says, "Sociometry is a combination of sociology and psychology, but it is neither of them" (1969, p.v).

Moreno and Chapin (1940) derived the term sociometry from socius (translated by Moreno as companion), and either the Latin metrum or Greek metrum, meaning a measure. However, the two sociometrists used sociometry in somewhat different senses. Moreno used the term in a narrower sense than Chapin. For Moreno, sociometry deals with the mathematical study of psychological properties of populations, using experimental techniques and the results obtained by the application of quantitative methods. This is undertaken through methods that inquire into the evolution and organization of groups and the position of individuals within them. We can conclude from Moreno's explanation that sociometry is concerned not only with the social structure of groups but also with such topics as the measurement of attitudes, interests and personality qualities of the individuals who compose them.

After the 1962, sociometry developed in three different directions according to differences in methodology; the first approach was called dynamic sociometry. Moreno and Jennings represented this approach. The second approach is diagnostic sociometry. The main figures in this group included J. Criwell, G. Lindberg, U. Branfenbrenner, M. Northway, M. Bonney, L. Zeleny, C. Loomis, F. Chapin, and E. Bogardus. The last group was mathematical sociometry. The major names in this group were P. Lazarsfeld, S. Dodd, L. Katz, and J. Steward.

In general, sociometric studies have been done in the following areas of social psychology: elements of social interaction, norms and social control, interaction and decision process, social perception, social exchange and helping behaviour, group development, interpersonal choice, personality, social

characteristics of small groups, effects of group size, the prisoner's dilemma and other two-person games, games which emphasize bargaining or cooperation as well as competition, the "risky-shift" phenomenon, communication networks, leadership, productivity, research methods and their applications to small group research. Sociometry has often used for applied research in education, the military, industry and formal organizations were small group structures could be identified.

2.3. Development of Sociometry under Moreno's Influence

Moreno considered sociological thought to have derived from three main sources. The first of these was the sociological tradition that developed in France following the French Revolution. For Moreno, the energy of the French Revolution produced sociology during the 19th century and the bourgeoisie played an important role in the emergence of sociology as a scientific system. The second source was scientific socialism that arose in Germany and Russia during the late 19th and early 20th centuries. It was based upon the ideas of Karl Marx, although Marx in turn developed his ideas from French, English, and German social thought. Scientific socialism spread widely beyond Germany and Russia as the system of revolutionary social science and historical interpretation. The last main source of social thought was sociometry, as developed in the U. S. by Moreno himself. According to Moreno the roots of sociometry, come from France, England and Germany and were to be found in works of A. Quetelet, J. Graunt and J. Sussmilch. However, these forerunners did not develop a true sociometric approach, because "the historical situation was not ready, and the social climate was not favorable" (Moreno, 1969: vii).

Moreno says that sociometry has drawn upon all the social sciences including anthropology, sociology, psychology, and psychiatry. According to Moreno, sociometry came of age as a social science in the 1930s due to the contributions of "two great leaders of American sociology, Ward and Giddings" (p, vii). The work of Mead and Cooley also contributed. Although, Simmel, Von Wiesse, Gurwitch, and Moreno had conceptualized some aspects of sociometry and micro-sociology in Europe, it was primarily a product of American social science. Moreno claimed that sociometry flowered in America because, "More than any other living variety of the human species, the American man loves to express status in figures, and he is the HOME METRUM" (Moreno: 1960: vi). Moreno's perspective on sociometry also made use of Social Darwinism. The main question for him was "Which are the 'social' laws of natural selection?" or "Who shall survive?"

Zerka Toeman (1963) classifies the historical development of sociometry into three periods:

1) The first period occurred between 1905 and 1925. Moreno was an important figure in this period. He was working in Europe and applying group therapy to children in Vienna. He developed his ideas about the interaction of persons at this time. During 1915-1918 Moreno worked for the Austrian government to help with the organization of a colony of about 10,000 Austrian citizens of Italian extraction. This experience gave Moreno the idea of a sociometrically planned community.

2) The second period was from 1925 to 1940. Moreno was living in New York. In 1933, the Medical Society of the State of New York held a convention at which Moreno presented a paper about the experimental study of small groups. The name of article was "Psychological Organization of Groups in the Community. "Following this in 1934, Moreno published his famous book *Who Shall Survive? A New Approach to the Problem of Human Relations*. He described this work as 'the foundation stone of the sociometric movement' (1960: 29). Two years later in 1936, two journals were established, *Sociometric Review* (later its name was changed to *Sociometry*) and *A Journal of Interpersonal*. The first editor of *Sociometry* was Gardner Murphy.

3) From 1941 to 1963 sociometric ideas spread in the United States and in some European countries. In 1941, Bacon House, a publishing house for sociometric books and monographs, was founded. In 1942, the Sociometric Institute was founded in New York City. The Institute was dedicated to teaching sociometric disciplines and training qualified sociometrists who would be able to introduce courses in sociometry within their own universities. One of the main purposes of the Institute was to be a meeting-point for all relevant disciplines, including psychology, sociology, cultural anthropology, biology, psychiatry and economics. The Institute also tried to expound the aims of sociometry through the publication of books and monographs. The Institute designed popularized statements to make the public aware of the 'value' of sociometry. In 1955, following a principle that "the best way to spread a novel idea is to give it away," the Institute transferred its journal took the title of *Sociometry*, to the American Sociological Association. After this, the journal took the title of Sociometry: *A Journal of Research on Social Psychology*.

For Moreno, sociometry accepted a moral objective in addition to its scientific goals. Moreno stated that "The claim of sociometry is to help in the formation of a world in which every individual whatever his intelligence, race, creed, religion or ideological affiliations, is given an equal opportunity to survive and to apply his spontaneity and creativity within it" (1955: 198).

2. 4. The Journal of Sociometry

Equally important as Moreno's influence on the development of sociometry was the evolution of the scholarly journal, which during four decades

was a major outlet for sociometric studies? In 1936, a journal was founded by Moreno: *Sociometric Review* and one year later its name was changed to *Sociometry*. In 1978, the title was changed again *to Social Psychology* by the Council of the American Sociological Association. The main reason for this change of title reflects a broadened sociological understanding of the journal's mission and readership.

In the 1970s, there was an increased polarization within sociometry and the other subfields of social psychology. The disciplinary boundaries between sociology and psychology became more distinct. In order to separate themselves from psychology, sociological social psychologists preferred to rename the journal. Their aim in doing this was to give emphasis to the processes and products of social interaction rather than to psychological factors per se. Their concern was to include the study of primary relations of individuals to one another, or to groups, collectivities, or institutions and to study inter-individual processes as individuals influence and are influenced by social forces. Another reason for these changes was probably the need to explain social events in relation to wider contexts rather than remaining exclusively at the small group level. This movement reflects a growing sociologism, which is the desire to make sociology an independent science rather than reducing human behaviour to the psychological level totally.

There was a further change of title. In 1978, Social Psychology was changed to *Social Psychology Quarterly* (SPQ). The main reason for this further change was to distinguish this journal more clearly from others that included 'social psychology' as part of their titles; such as the *Journal of Personality and Social Psychology* (JPSO), the *Journal of Experimental Social Psychology* (JESP) and the *Journal of Applied Social Psychology* (JASP). Each of these journals was slanted toward psychological social psychology.

3. Crisis and Theoretical Shift in Small Group Studies after the 1950s

As it mentioned, sociometry is the study of small groups and a subfield of social psychology. Its interdisciplinary status necessarily causes it to bear some similarities with other social psychological approaches. It also shares some common assumptions and tools with these other viewpoints. It will be beneficial to begin with small group studies. This will provide an overall picture of sociometry in relation to other approaches. We need to understand that sociometry was never an isolated approach. Its fate-including both its successes and failures-was closely related to developments in related subfields and disciplines.

Taylor (1970) divides small group studies into two categories: the interpersonal and the intrapersonal perspectives. The interpersonal perspective is a sociological approach that deals with the ways in which people behave in groups on the basis of their likes and dislikes, and other aspects of their interaction. The intrapersonal perspective is a psychological that is illustrated by cognitive consistency, balance, dissonance, and congruity theories. These theories focus on the ways in which persons perceive things and then organize, arrange, and relate them in their own minds.

During the 1950s, most researchers began to search for and to develop more theoretical perspectives in small group research. For example, George Homans derived group activities from the conditions under which a group operated. To explain this process, he used the concepts of internal and external systems. These two systems operate together but they can be analytically distinguished. This distinction allows the use of small groups in laboratory situations, where the external system is under experimental control. In field situations, the external system of the small group is the rest of the world. Thus, Homans believed that communities, laboratory groups, and parts of organizations can be analyzed within the same framework. Homans' framework aims to provide a synthesis of sociology, psychology and anthropology. Despite his attempt at synthesis, Homans' (1961) took a reductionist position that all sociological phenomena necessarily follow from psychological laws. He claimed that "All social phenomena are to be explained in terms of characteristics of individuals rather than social structure" (Homans, 1974).

There are other small group theories that tried to create a workable synthesis. These include the works of Festinger (1957), Thibaut and Kelley (1959), and McGrath and Altmon (1966). However, these studies also suffered from psychological reductionism. Moreover, the style of small group research contributed to the lack of comprehensive theory development. Small group studies, including those in sociometry, involved small and non-replicated empirical studies reported without reference to any broad theoretical framework (Friedrichs 1973).

McGrath and Altmon (1966) suggested several reasons for the failure of small group studies. First, there were high costs of doing any data analysis. To process the data took a long time since there were no advanced computers then. Existing computers and computer programs could not analyze these processes very well, without high costs. The lack of theory, furthermore, made most computer analysis into elegant, number-crunching exercises with little point. As a result, small group research failed to develop a unified theory in sociology.

According to Mullins (1973), there are some social reasons for disintegration and collapse of small group research. First, there was the fragmented and non-cooperative nature of the research. Small group researchers divided into factions that were weakly connected at the intellectual level. Five factions were listed by Mullins: (1) Kogan, Taguri, and Blake were interested in cognitive process (psychological). (2) Festincer, Schachter, Bach, Thibaut, Kelly, and Brehm focused on personal construct theory. (3) Caster and Lanzetta were interested in equity problems that specific conditions. (4) Lewin, Lippit, Zader, and Cartwright were interested in leadership and used experimental psychology. (5) Bales, Borgatto, Hare, Mills, Slater, and Strodbech, called the Harvard Group, focused on sociological social psychology.

Furthermore, in time these factions either disappeared or subdivided. For example the Harvard Group of sociological social psychology subdivided into two groups. One of these groups included Bales, Borgatto, Hare, and Strodbech whose main orientation was sociological, and the second group included Lindsay, Riecken, Taguri and Thibaut who were more concerned with psychological issues.

The second reason for the collapse of small group research was the interdisciplinary status of social psychology, its linking of both sociology and psychology. This ambiguity of status resulted in fewer positions for social psychologists over time. Many social psychologists were trained in interdisciplinary programs such as those at Michigan and Harvard. During the 1950s, the status of social psychologists in sociology was at its peak, but it declined after that. According to McCartney (1970), the percentages of social psychological articles out of total sociological articles were 3.3 percent between 1955-59, and 6.2 percent between 1960-64. Other reasons for the decline of small group studies in sociology include the lack of students and young intellectual leaders as well as the popularity of macro sociological currents after the 1960s.

4. A Survey of Sociometry Articles: 1952-1989

This part of the study presents a survey of sociometry and social networks articles. To measure the development and decline of sociometry within sociology, an analysis of sociometric articles was done for the years 1952-1989. In addition, a comparison was made of the publication rates of sociometry and social network articles for the years 1978-1989.

4.1. Data Collection

The basic objective was to count sociologically-oriented sociometry and social network articles. It was sometimes difficult to decide which sociometric articles were sociological. Only articles that were clearly sociologically-oriented were included in this survey because the aim of this study was to focus on sociologically-oriented sociometry rather than psychologically-oriented sociometry. The data for both sociometry and social network articles were gathered from *Sociological Abstracts* and *Social Science Index*. For the sociometric articles, the following information was collected: publication year, journal title, author's name, and institutional affiliation when available. For social network articles, publication year and journal title were recorded.

4.2. Analysis And Results

4.2.1. Institutions: From the data collected, it is possible to deduce which academic institutions were most involved in the growth of sociological sociometry after 1952. Table 2 shows seven universities in the sample (top 10 %) where most of the sociometric articles were published. These institutions account for about 44 percent of all sociometric articles published during these years. These universities were the centers of sociometric research.

These leading institutions are all major research universities located in the Northeast and Midwest of the United States. Three of these universities declined as centers of sociometric publications in the 1960s. These universities were Cornell University, Harvard University, and New York University. In only one institution, the University of Illinois-Chicago, sociometric articles continue to publish into the 1980s. The average span during which these institutions had faculty involved in publishing sociometric articles was 15 years.

Table 2: Leading Institutions at which Faculty Published Sociometry Articles, 1952-1989.

Institutions*	No. of Articles**	Span of Years
U. Illinois-Chicago.	17	1952-1984
U. Michigan-Ann Arbor	11	1961-1978
U. Wisconsin-Madison	10	1957 -1979
Harvard U.	9	1959-1968
Carneige-Mellon U.	8	1970-1973
Cornell U.	8	1960-1968
New York U.	7	1952-1964

Top 10 %, 7 institutions 70 articles
* Total number of institutions = 68.
** Total number of articles =179.

4.2.2. Authors: We can also look at the most published authors of sociometric articles. From Table 4.3 it is seen that about 3 percent of the authors published about 15 percent of the articles. About 87 percent of the authors published only one article. An additional 10 percent of the authors published 2 articles.

In Table 4, we see that nearly 97 percent of the authors in the survey published one or two sociometric articles. Therefore, the leading sociometry researchers were a group of 14 authors wo published three of more articles. Table 4 lists those leading authors. Some authors published sociometric articles before 1952, because of the restrictions of the sampling procedure, those articles were not included. In particular, Moreno, Lundenberg, and Zeleny published articles before 1952.

Table 3: Frequency of Authors Publishing Sociometry Articles by Number of Articles, 1952-1989.

No. of Articles	No. of Authors	Percent
1	383	86.7
2	45	10.2
3	8	1.8
4	1	.2
5	2	.5
6	2	.5
7	1	.2
Total	442	100.1

According to the data gathered from *Sociological Abstracts* and *Social Science Index*_for the years of 1952-1989, the most prolific authors were Bjerstedt, Moreno, Nehnevajsa, Holland and Leinhardt. The average span of publications for this group of 14 leading sociometry researchers was about 8 years. The last cohort of leading authors was Holland and Leinhardt, who published collaboratively during the 1970s. None of the leaders published after 1977.

Table 4: List of Authors who published three or more Articles, between 1952-1989.		
Author	**No. of articles**	**Span of years**
1- Bjerstedt, A.	7	1955-1963
2- Moreno, J. L.	6	1952-1964
3- Nehnevajsa, J.	6	1955-1968
4- Holland, P. W.	5	1970-1977
5- Leinhardt, S.	5	1970-1977
6- White, H. C.	4	1961-1971
7 - Lundeberg, G. A.	3	1952-1955
8- Zeleny, L. D.	3	1952-1955
9- Borgatta, E. F.	3	1960-1975
10- Hoffman, C. B.	3	1962-1966
11- Alexander, C. N.	3	1 963-1 968
12- Brown, J. S.	3	1 965-1966
13- Singh, R .P. M.	3	1968-1973
14- Alba, R. D.	3	1972-1973
Total: 14 authors	57 articles	

4.2.3. Articles: Figure 1 shows cumulative growth of sociometric articles published between 1952 and 1989. The figure shows that the growth of the sociometric literature began to level off after 1969. The growth curve is nearly horizontal in the late-1980s.

Figure 1. Cumulative Growth of Sociometry Articles 1952-1989.

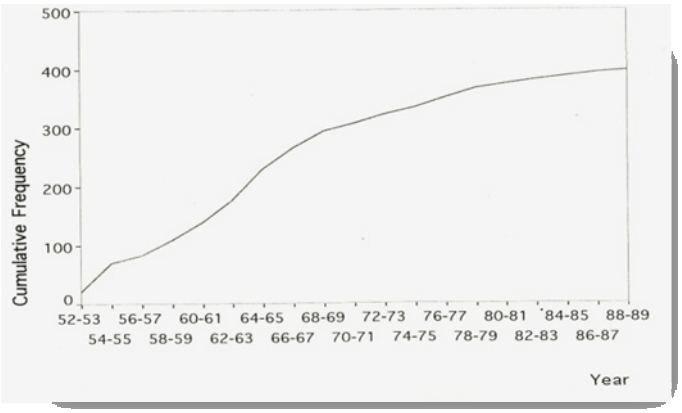


Figure 2. Publication of Sociometry Articles 1952-1989

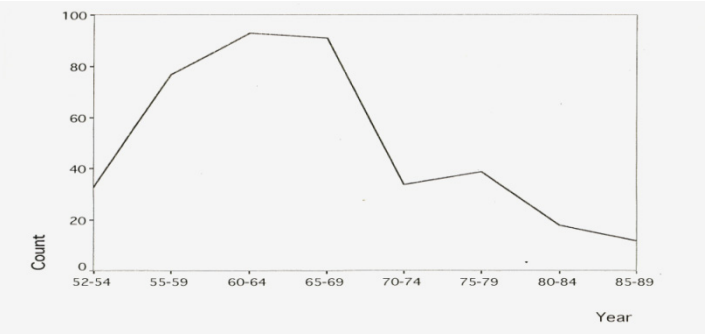


Figure 2 shows this declining interest in sociometric research even more clearly. Sociometry publications increased dramatically between 1952 and 1964. After 1969, there was a rapid decline in the number of articles. By the end of the 1980s, only about half as many sociometric articles have been published as in the early 1950s.

4.2.4. Journals: Sociometric articles were found to be published in 134 different journals. Table 5 shows the frequency of journals by number of articles. We see that 63 percent of the journals published only one sociometric article, another 16 percent published 2 articles. This means that nearly 80 percent of the journals have published one or two articles only. Conversely, a few journals have been major outlets for sociometric research.

Table 5: Frequency of Journals Publishing Sociometry Articles by Number of Articles, 1952-1989.

No. of Articles	No. of Journals	Percent
1	84	62.7
2	21	15.7
3	10	7.5
4	1	.7
5	2	1.5
6	4	3.0
7	2	1.5
8	1	.7
9	1	.7
11	2	1.5
12	1	.7
13	1	.7
17	2	1.5
27	1	.7
64	1	.7
Total	134	99.8

Table 6 shows the journals that published the largest numbers of sociometric articles. The eight journals, listed in the table, account for about 43 percent of all sociometric articles. Not surprisingly, *Sociometry* leads the list of most important journals followed by the flagship disciplinary journals, *American Sociological Review* and *American Journal of Sociology.* The average span of sociometric article publication in these journals was 21 years. The publication of sociometric articles in the flagship journals stopped in the 1970s. It was not surprising that some specialized journals have the longest span of publication. These journals were: *The Journal of Group Psychotherapy*, *Psychodrama and Sociometry* where the span was 35 years and *Sociometry* where the span was 24 years.

The 134 journals are categorized into 5 types. The first category consists of major U.S. sociology journals, namely *American Sociological Review*, *American Journal of Sociology* and *Social Forces*. The second group consists of other U.S. sociology journals, including *Current Sociology*, *Social Problems, Sociology of Education, The Sociological Quarterly, Sociological Inquiry,* and *Sociological Review.* This categorization was used to distinguish between the flagship journals in the discipline and journals that are either more specialized or are regional in nature. The major U.S. sociology journals are where the leading-edge research of general interest to the discipline is published. Therefore, the publication of sociometric articles in these journals should be a good indicator of how prominent Sociometry was in the discipline at different points in time.

Table 6: List of Journals Publishing the Most Sociometry Articles, 1952-1989.

Journals*	**Articles****	**Percent**	**Span of years**
Sociometry	64	16.1	1952-1975
ASR	27	6.8	1952-1977
AJS	17	4.3	1955-1972
Human Relations (England)	17	4.3	1957 -1974
J. of Mathematical Sociology	13	3.3	1966-1 985
Int. J. of Sociom. & Sociatry	11	2.8	1958-1964
Social Forces	11	2.8	1952-1971
J. of Group Psychotherapy, Psychodrama and Sociometry	9	2.3	1953-1987
Total	169	42.7***	

*Total number of journal s = 134.
** Total number of articles = 397.
*** Of total sample.

The third group consists of specialized sociometry journals. This category includes *International Journal of Sociometry and Sociatry*, *International Journal of Sociometry, Journal of Group Psychotherapy, Psychodrama* and *Sociometry and Sociometry*. The fourth group is consists of non-U.S. journals, including *The Australian & New Zealand Journal of Sociology, Japanese Sociological Review, Sociologia, British Journal of Sociology, Zeitschift for Soziologie*, and so on. The fifth and final group is made up of non-sociology journals. This type includes educational journals such as *Journal of Educational Psychology, Journal of Educational Research,* and *Teachers;* psychology journals such as *Journal of Abnormal Psychology, Psychological Research,* and *Group Psychotherapy*; organization journals such as *Administrative Science Quarterly*; anthropological journals such as *Human Organization* and *Southwestern Journal of Anthropology*; and political science journals such as *Journal of Politics*.

Figure 3 shows the breakdown of all sociometric articles in the sample by type of journal. It demonstrates that about 30 percent of the articles appeared in either major journals or other U.S. sociology journals. Nearly as many articles were published in non-sociology journals. Sociometry journals accounted for 22 percent and non-U.S. sociology journals for 18 percent of the articles.

Figure 3. Sociometry Articles by Type of Journal 1952-1989.

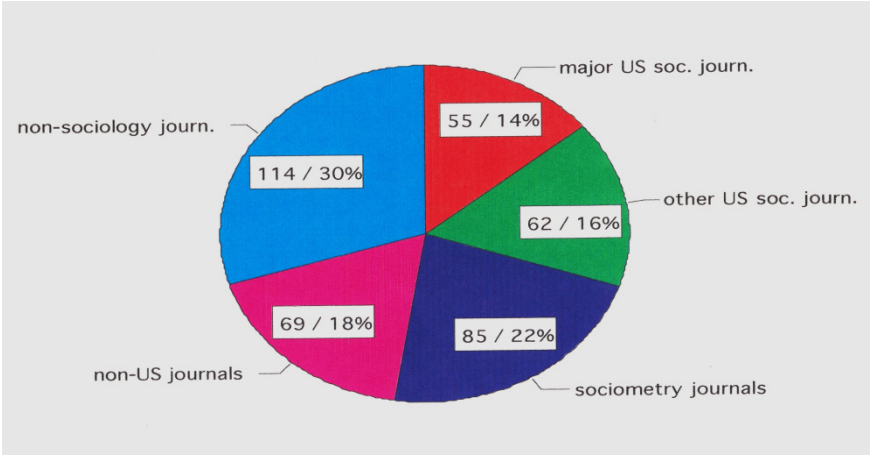


Figure 4 shows the growth of the sociometry literature by type of journal. Except for other U.S. sociology journals, where the literature continued to grow throughout the period considered, the publication of sociometric articles began to level off in the late-1960s and early-1970s. This levelling off first appeared in major U.S. sociology journals, where publications stopped after

1974. This trend was quite more gradual for sociometry journals, but the rate of publication growth has been nearly flat since the late 1970s. The publication of sociometric articles began to decrease in non-U.S. journals at the start of the 1980s, followed by non-sociology U.S. journals after 1984. Only "other" U.S. sociology journals have continued to publish sociometric articles at a fairly steady rate throughout the period.

Figure 4. Cumulative Growth of Sociometry Articles by Journal 1952-1989.

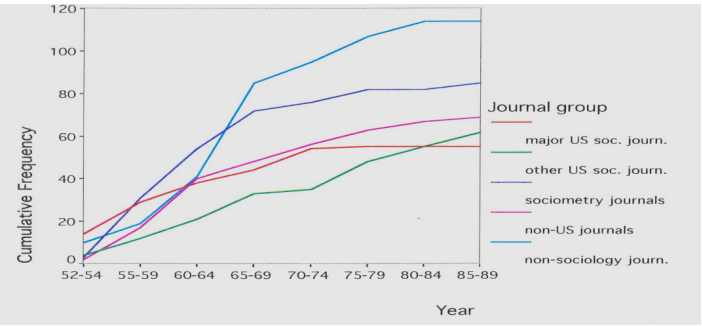
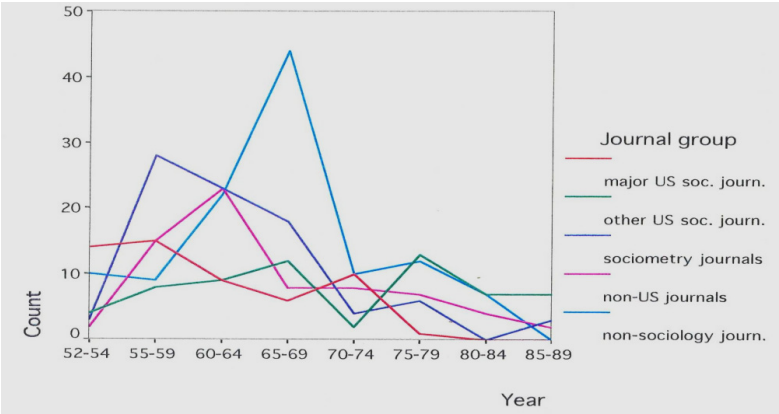


Figure 5 shows that the "other" U.S. sociology journals were the most important venue of publications for sociometric articles in the late 1980s. The heyday of publication in other types of journals was a full decade or more earlier. Major U.S. sociology journals and sociometry journals published their largest count of sociometric articles in the late-1950s. The high point for non-U.S. journals was in the early-1960s and for non-sociology journals, it was in the late 1960s.

Figure 5. Frequency of Sociometry Articles by Journal Groups 1952-1989.



4.3. Comparison of Publication Trends: Social Networks versus Sociometry

Social network analysis has supplanted sociometry in popularity among sociologists, probably because, unlike sociometry, social network analysis is not founded on psychological assumptions. Social network analysis stresses sociological interests and concerns by focusing on the relations among units rather than the attributes of individuals. In this section, sociometry and social network publications will be compared to lend empirical support to this trend.

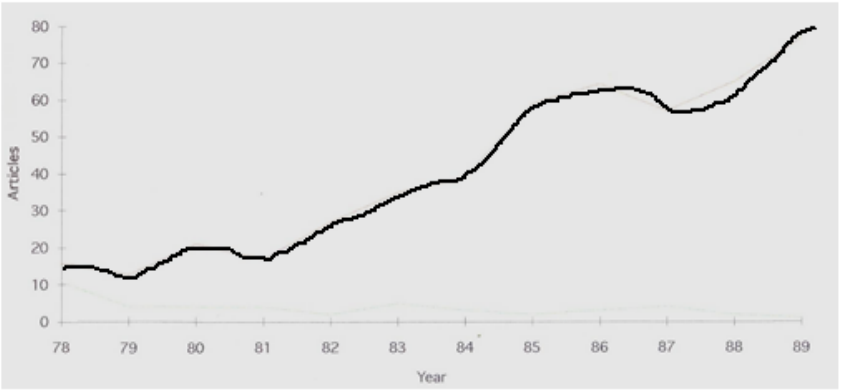
Social network data were collected using *Sociological Abstracts* and *Social Science Index*. *Social Science Index* was called *Social Science* and *Humanities Index* before 1974-75. The concept of 'social networks' first appeared in *Social Science Index* in 1976-77 but was referenced as 'social structures' until 1979-80. From 1980-81 until 1983-84 'social networks' appeared in *Social Science Index* referring to 'network analysis (sociology)'. After 1984-85, 'social networks' became a distinctive subject and at the same time was cross-referenced with 'social network analysis' and ‘networks analysis’ (sociology). The concept of social network first began to be used as major subject heading in *Social Science Index* after 1984-85. "Social networks" did not appear in the *Index of Sociological Abstracts* until 1978. Thus, social networks and sociometry will be compared only for the period of 1978-1989.

From Figures 1 through 5 we have already seen that the decline of sociometric articles began early in the 1970s and this decline accelerated in the late-1970s and early-1980s. Figure 6 shows the number of sociometry and social network articles published between 1978-1989. Red line shows number of social network articles and green line shows sociometry articles. Figure 6 indicates that while sociometry has been marginalized since 1978, social network articles have grown fairly steadily. By 1989, there was only one sociometric article published while publications dealing with social networks had grown to 77 articles.

The findings describe and analyse four areas: academic institutions, which were most involved in the development of sociometry, journals that published sociometric articles, authors who wrote articles o sociometry, and trends in the publication of sociometric articles. A second analysis was done for social network articles in order to compare the trend of their publication with the publication trend of sociometric articles. The data showed that the core institutions where sociometry publication occurred were flagship research institutions, all located in the Midwest and Northeast of the United States. These institutions were centres of sociometric research in the 1950s through the early 1960s. After the 1970s, these major research universities were not centres of

sociometric research anymore with the exception of the University of Illinois-Chicago where the last sociometric article was published in 1984.

Figure 6. Social Network and Sociometry Articles 1978-1989.



A similar trend occurred for the journals. The number of sociometric articles declined in the 1980s, except in other U.S. sociology journals. The major U.S. sociology journals were publishing sociometric articles when sociometry was at its peak during the late-1950s and the 1960s. By the beginning of the 1970s, publication of sociometric articles in major U.S. sociology journals began to decline. Another interesting point was the decline of sociometric articles in sociometry journals. This showed that publication in sociometry journals, besides declining in number, flowed into other sociology journals, which were mostly specialized journals or journal published by regional sociological associations. The declining trend in number of sociometric articles in major U.S. journals, sociometry journals, non-U.S. journals, and other journals is an indicator of the declining importance of sociometry within sociology.

The investigation of sociometric authors showed the same results for institutions and journals. Leading authors of sociometry published mostly during the 1950s and 1960s and only two leading authors published frequently in the 1970s. After 1977, the leaders of sociometry in the sample ceased to publish. Another interesting point was that most of the authors (about 97 percent) only published one or two sociometric articles. This indicates that most of the authors did not maintain a continuing interest in sociometry for much of their research careers. Eight years was the average span of publication for the leading authors. They either became interested in other fields of sociology or only used sociometric analysis once or twice during their careers. Another possibility is that, although we do not have enough data to support this

hypothesis, same of those authors may have focused on psychologically oriented sociometry, which was not an interest in this study.

When we look at the number of sociometric articles over time we see that, a decline occurred during the 1970s. The publication of sociometric articles peaked during the 1950s and 1960s. By the beginning of the 1970s, it began to decline gradually and by the end of the 1970s, this decline accelerated. During the 1980s, only a few articles were published.

Comparison of the sociometry and social network articles for the years of 1978-1989, shows that while sociometric articles were few and their numbers were declining, publication of social network articles was increasing rapidly. In 1978, the number of sociometric articles was 11 while the number of social network articles was 16. By 1989, the number of sociometric articles declined to 1 and social network articles had expanded to 77. This result indicates that while sociometry was becoming marginalized, the importance of social network research was increasing for sociologists. This result was also an indication of the replacement of sociometry by social network analysis in sociology.

5. Conclusion

The data used in this study has been collected from two sources. The first source was the literature review used to explore the field of sociometry and to define its relations to other subfields and approaches. The second source, an analysis of sociometric articles published between 1952 and 1989, was used to measure the development and decline of sociometry. Additional analysis was done to compare publication rates of sociometry and social network articles. At this point, before discussing their implications, it will be helpful to summarize those findings.

Sociometry was a method used in small group research to measure interpersonal affect and to define the structure of groups or organizations. It developed as a distinctive approach after it was founded by Jacob Moreno in the 1930s. Sociometry was affected by the development of other related subfields and approaches, as well as by intellectual crises in these subfields and approaches. Specifically, crises in social psychology and small group sociology had an impact on the future of sociometry.

In this study, information gathered from the analysis of sociometric articles. The information included the academic institutions, which were involved in the publication of sociometric research, authors who published sociometric articles, journals, which published sociometric research, and the growth of the sociometric literature. Almost all information gathered indicated that sociometry has declined during the last two decades.

A few major research institutions in the United States were most involved in the publication of sociometric research when sociometry was at its peak. These leading universities included the University of Illinois Chicago, Michigan, Wisconsin, Harvard, Carnegie-Mellon, Cornell, and New York University. The data illustrated that these institutions were centers of sociometric research until the 1970s when sociometry began to decline, except for the University of Illinois-Chicago where publication of sociometric articles continued into the 1980s.

When we look at the authors of sociometric articles, we see that about 450 authors published sociometric articles between 1952 and 1989. The results showed that almost 97 percent of the authors published only one or two articles and about 3 percent of the sample published three or more sociometric articles during their career. Bjerstedt, Moreno, Nehnevajsa, Holland, Leinhardt, and White were found to be the leading sociometry researchers. When we look at the span of years for the publication of sociometric research by author, almost all of them had published their last articles in the 1960s or the first half of the 1970s. Thus, after the mid 1970s, there were no leading sociometric researchers according to the data collected from *Sociological Abstracts* and *Social Science Index.*

Another issue was the number of the articles published each year. The data showed that the publication of sociometric articles increased during the 1950s and reached its peak in the 1960s. Then, by 1969, the growth of sociometric literature begins to level off. The 1970s brought a declining trend for sociometric research and this trend accelerated by the end of the 1970s. In the 1980s, only slight evidence of sociometric research appears in the journals. Not surprisingly, the analysis of sociometric publications showed similar results with that of institutions and authors.

Another analysis was done for the journals, which published sociometric research. The results showed *that Sociometry, American Sociological Review* and *American Journal of Sociology* were the journals, which published the most sociometric research. To show the trend in publication of sociometric articles, the 134 journals were categorized into five groups: major U.S. sociology journals, other U.S. sociology journals, sociometry journals, non-U.S. journals, and non-sociology journals. Data showed that, while sociometry was at its peak, major U.S. sociology journals were more involved in the publication of sociometric articles. This trend was the same for the other journal groups except for the other U.S. sociology journals, which have continued publishing sociometric articles after it lost popularity in the other groups of journals. These results showed that, when sociometry began to decline, major U.S. sociology journals stopped publishing sociometric research then the other journal groups followed this trend. In the 1980s, most sociometric research has been published

in other U.S. sociology journals, a group which included regional and specialized journals.

A second analysis was done for social network articles during the 1978-1989 period in order to compare the publication of social network and sociometric articles. The reason for making this comparison was to test the idea that social network analysis has supplanted sociometry within sociology. The data showed that between 1978 and 1989 the number of social network articles grew rapidly while sociometric articles decreased. Apparently, the popularity of social network analysis increased while sociometry became increasingly marginalized.

In the first part, a number of theoretical issues were proposed that influenced the growth and decline of scientific paradigms. This section highlights these seven issues and interprets the career of sociometry in light of them.

1) *Intellectual currents within* a *scientific discipline may challenge the development* of *paradigms within subfields and specialties.*

In the case of social psychology, especially after the 1960s, radical and critical sociological movements and translations from French and German sociology gave rise to more historical and theoretical studies and to macro level analysis.

Together with these currents, sociologism had changed social psychology. Sociologism refers to the view that sociology as a science is completely irreducible to psychological factors and consequently sociology is both necessary and sufficient in the total explanation of social reality (Tiryakian, 1962). This movement developed contrary to psychologism, which attempts to explain social structure exclusively in terms of emergent factors which can be reduced to the attributes of individual psychology. The sociological side of social psychology emerged during the 1920s as an alternative to psychologically oriented, experimental social psychology. Between the 1940s and 1970s, sociologism among social psychologists reached its peak.

The main differences between these two intellectual currents lay in their definitions of the field, and their respective tasks and methods. Psychological social psychology defines social psychology by its focus on psychological processes of individuals. Its task is to understand the impact of social stimuli on individual psychology. On the other hand, sociological social psychology defines social psychology by the interaction between society and individuals. Their crucial task is the explanation of social interaction. Psychological social psychology primarily uses experimental method while sociological social psychology also uses observation and survey methods (House, 1977).

Due to the widening gulf between sociologists and psychologists, sociometry, which had strong historical links with psychoanalysis, was relinquished by sociologists to psychologists. Meanwhile, sociologists were joining the social networks approach. Evidence of this was indicated in Figure 3, by showing that social networks publications displaced sociometric ones. Also, comments from respondents indicated that interest in social networks had replaced sociologists' earlier interest in sociometry. The results of the "Sociometry Survey" showed that almost one in three respondents thought that macro-sociological currents after the 1960s, and more than 20 percent of respondents thought that critical and radical sociological perspectives in U.S. sociology after the 1950s had important effects on the decline of sociometry within sociology.

Sperber (1990) has commented on a widespread sense of crisis in sociology during the 1960s and early 1970s:

> The crisis in the professional identity of American sociologists ... stemmed from a well founded the embarrassment of riches in the competing theoretical models, research methods, fields of specialization, priorities for research, criteria of validity, and polarized schools of thought ... In the discipline intense conflicts erupted over the legitimacy of Marxism and political activism inside and outside the classroom, inside and outside leading research centers, inside and outside the jurisdiction of the profession itself; these conflicts tended to reflect and exacerbate the growing sense of alarm felt through the discipline in the 1960s and early 1970s (1990: 128).

In the previous parts, the history of these crises as they influenced small group studies and sociometry were traced. The crises in small group studies began in the 1950s and accelerated until the 1970s. During this period, most researchers began to look for and develop different theoretical perspectives in small group sociology. Although their subject was the same - small groups - their perspectives were different. Despite the fact that, there were some attempts to create a workable synthesis in small groups' studies (Homans,1956, 1961; Festinger, 1957; Thibaut and Kelley, 1959; McGrath and Altmon 1966), the approaches were founded on psychological assumptions. The style of small group research contributed to a dissatisfaction with existing paradigms. Small group research, including sociometry, involved small and non-replicated empirical studies that were reported without reference to any broad theoretical framework.

Sociometry was also affected by this crisis in American sociology and sociometry's popularity began to decline at the beginning of the 19705. The data showed that the publication of sociometric articles in major U.S. journals

began to decline at the end of the 19605. The decline of sociometric article publication in major U.S. journal is important because these journals validate what is most current in the discipline. Non-U.S. journals followed this trend about five years later. The major journal of sociometric research -*Sociometry* - began to publish fewer sociometric articles and more articles using other social psychological approaches by the end of the 19605. This change in the journal's contents was also followed by the journal's change of title.

2) *Crisis within the social sciences results from the perceived need to find new solutions. If* a *scientific approach/paradigm cannot produce* a *successful solution for problems then it may fail and be replaced by* a *more successful competitor.*

Sociometry could not address a number of questions sociologists showed interest in during the 1970s. These questions include how to study power relations, conflicts, and cleavages in groups and the effects of macro structures on group relations. On these topics as I argued before, network analysis held substantial advantages.

3) *Competition among social scientists, schools, and paradigms for resources such* as *research funds, prestige, and academic recognition may cause changes in the social sciences.*

Social network studies focus on the relations among units rather than the attributes of individuals. This approach is more sociological because network researchers draw inferences about the behaviour of elements (parts) from aspects of the overall structure (wholes). On the other hand, most sociometric researchers assumed that systems are nothing more than the sum of the attributes of their elements (parts). Their reasoning called for drawing inferences about wholes from their parts.

Social network analysis dealt with relational aspects of social structure and provided researchers greater theoretical flexibility and broader applicability. Sociometry lacked these advantages. Social network analysis has been able to explore a broader range of issues that are important to sociologists including power relations, communications between groups, and social cleavage and conflict.

4) *Levels* of *funding and student interest can have important effects on paradigm development.*

A major interest seems to be funding. Most researchers want to earn more money in their studies. If we take into account that social scientists earn less money than other professionals with similar training, we can understand this desire better. One of the respondents stated that he had moved to another subfield in sociology because of the lack of grant money for sociometric

research. After the 1960s, funding for sociometry may have defined, because, as explained before, the focus had changed and sociometric studies were no longer getting published in the major journals.

5) *Innovations in the technology of research, for instance, computers, telephone survey, etc., can affect scientific paradigms and research programs.*

Technological advancement has a two-sided effect on the social sciences, internal and external. In this section, these two closely interrelated factors were analyzed. Developments in computer technology and communication have had a multidimensional impact on science. In the social sciences, advanced computing made it easier to process data gathered from large populations. One-third of the respondents found the rise of computer assisted survey research on large populations as an important reason for the decline of sociometry. As noted before, efforts to integrate sociometry with survey research have not been very successful.

Sociometrists began using questionnaires to collect information for constructing sociograms. However, the detail of information, which is necessary for the construction of a sociogram, is limited by this method. The content of the interaction is restricted to friendship and characteristics of the interaction are usually given secondary importance. This suggests that questionnaires only play a secondary rather than a primary role in sociometric studies.

6) *Theoretical integration causes change in the social sciences because it redefines disciplinary boundaries and research agendas.*

In sociometric studies, researchers could only deal with small group structure and process. To provide theoretical integration, they had to move to a more macro level. This was also one of the reasons for separating sociology from psychology: to move away from the individual level toward the societal level. This led to the division between sociological social psychology and psychological social psychology in small group studies in the 1970s.

Sociometrists normally work with a distinct group of subjects such as children in a classroom, soldiers in a troop, and workers in a factory. But the problem for sociologists is different because they are interested in the behaviour of individuals in a situation which may be affected by circumstances beyond the immediate context. For example, the behaviour of a child towards another in a classroom will probably be conditioned by the child's knowledge that her/his mother or father knows the mother/father of the other child. In this case, the network needs to extend beyond the classroom to the parents of the children.

Sociometry did not disappear totally from sociology but it became integrated into other small group approaches and studies and many of its methods were taken into social network analysis. This integration also brought

some important changes in sociometry at the level of conceptualization, language, and terminology. In order to distinguish sociology from psychology, the concepts of sociometric analysis were changed and integrated with social network concepts. The methods of research were similar but they were more directly related to social structure and to incorporating greater use of macro-level theory.

7) *Methodological clarification and advancement has an impact on paradigms because it changes the way in which scientific problems are addressed.*

Another important factor can be seen in the development of research methods, which also resulted in the integration of sociometry into other fields. Before the 1970s, sociometric research emphasized laboratory experiments. Afterwards, there was an important change in methodological approaches used by sociologists. The new methods included content analysis, field experiments, qualitative field studies, sample surveys, and ethnographic social observation. With these changes, researchers could reach more people and collect more data from the population. The result of these developments allowed researchers to collect data from varied sources on larger populations and led them to conceptualize research problems with higher-order theory.

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