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THE CAREER OF SOCIOMETRY WITHIN SOCIOLOGY

ABSTRACT

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Director of Thesis: Edward B. Reeves, Professor
ABSTRACT

The topic of this thesis was to define factors that have effects on change in science. Specifically, I illustrate change in science with an examination of the career of sociometry within sociology. The sociology of science and sociology of knowledge perspectives were used to explore internal and external factors affecting sociometry. Several sources were used to collect data. The first of these was a review of the literature in sociometry and related areas. The second source was an analysis of the publication of sociometric articles between 1952 and 1989. A similar analysis was done for social network articles published between 1978 and 1989 to compare publication trends in sociometry and social network analysis. Sociological Abstracts and Social Science Index were used to collect the data for both analyses. The last source was a mailed questionnaire sent to active sociologists who have published sociometric articles.

Results showed that the sociometry literature gradually developed until the end of the 1960s and then began to decline. By the end of the 1970s, this downward trend accelerated and during the 1980s only a few sociometric articles were published. Meanwhile, during the 1980s, social network articles have been increasing.
As sociometry declined, major U.S. sociology journals and research institutions stopped publishing sociometric articles. The lack of comprehensive theory development, the restrictive focus of sociometry, the lack of students, the emergence and/or development of other perspectives in social psychology, and the rise of computer-assisted survey research on large populations were important reasons for the decline of sociometry within sociology.

The results of this study support a number of theoretical conclusions:

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 effects on paradigm development.
5) Innovations in the technology of research, for instance, computers, telephone surveys, etc., can impact 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.
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CHAPTER 1

RESEARCH PROBLEM

1.1. INTRODUCTION

Science is an area of modern culture where change is very rapid because it continually renews and transforms itself. This study, the career of sociometry within sociology, analyzes some of the basic dynamics of change in one of the social sciences by examining the case of sociometry.

1.2. 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 fully understand the career of sociometry one needs to examine the nature of the social systems (political, economic, ideological, technological and cultural) in which it developed, its stages of development, and their relation to each other. I would need 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 developments 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 other fields and theories? Lastly, how was it subsumed by different fields and theories?

In this study I cannot 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.

1.3. 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 sociocultural 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 judgment, and scientific knowledge grows in response to competition among scientific research programs.
Table 1.1: A Classification of Factors for Analyzing Change in Science

<table>
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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.

In the present study, I will use a combination of sociology of science and sociology of knowledge perspectives. 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 knowledge, and the internal factors are best explained by using the sociology of science. In fact, these two sets of factors are interrelated and sometimes indistinguishable because they overlap.

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, interest, competition, etc. within the scientific discipline or subdiscipline.

1.3.1. THE SOCIOLOGY OF SCIENCE

There are several theories focusing on the nature of scientific change from the perspective of internal factors. One of the most influential is Thomas Kuhn's theory of scientific paradigms. Kuhn, in his study The Structure of Scientific Revolutions (1970), discusses the idea of a paradigm. A scientific paradigm refers to an "exemplar" of scientific work that creates a research tradition within some specialized area of scientific activity. Kuhn points out that scientists work within paradigms, which are general ways of seeing the world and which dictate what kind of scientific work should be done and what theories are acceptable. Thus, a paradigm provides a working model for organizing science and guides the choice of research methods and theoretical interpretation.

According to Kuhn, a paradigm turns into a 'normal science' after being accepted in a scientific community. He notes that not all theories are paradigmatic theories. Both during pre-paradigm periods and during the crisis that leads to changes in the paradigm, scientists develop many speculative and inarticulated theories that can themselves point the way to
discovery. In the words of Kuhn, "only as experiment and tentative theory are together articulated to a match does the discovery emerge and the theory becomes a paradigm" (p. 61). In the stage of normal science, there is a consensus among the relevant scientific community about the theoretical and methodological rules, the research problems, instruments, and the standards. Kuhn proposed that in order to achieve the status of a scientific paradigm a scientific achievement must offer sufficient and convincing resolutions of previously recognized problems. This success is necessary to attract enough scientists to form the core of a new consensus. There also must be sufficient problems created by the paradigm to provide puzzles for subsequent research practice. Normal science is preoccupied with puzzle-solving and fine-tuning its perspective. However, failure to solve a puzzle creates an anomaly. A build-up of anomalies may result in a search for another paradigm which is able to solve these problems. Thus, this failure to solve problems in normal science may lead to a crisis. To meet this crisis, a new model of science in the problematic area may be produced. Members of the scientific community who study in this problematic area may accept this new paradigm. Then the new paradigm becomes the new way of puzzle-solving by the majority of the scientific community in the specific area.

A somewhat different theory of scientific change is dealt with by Nicholas Mullins in Theories and Groups in Contemporary American
Sociology (1973). Mullins suggests four stages in the development of a scientific theory. This four-stage model of theoretical development includes: the normal stage, network stage, cluster stage, and specialty stage. The beginning of each stage is signaled by changes in the group's social structure and intellectual output.

In the normal stage, the founders of a new theory or approach start on their careers. This stage is also characterized by a low degree of organization among the prospective founders of the new theory. In the network stage, a consensus begins to develop among a scientific group with respect to a new theory or approach. There is also an increase in communication among them. During this stage a program of research is set, and new students are attracted to the approach. In the cluster stage, communication among the members of the group increases. A research center is developed by two or more people who begin doing research in the new style. During the network and cluster stages, a literature grows focused on the new approach. The specialty stage begins after the cluster stage when the research center begins to break apart into groups that are interested in more specific problems. As Kuhn pointed out earlier, Mullins also suggests that success is necessary for the survival of the group of scientists. Success (in the intellectual sense) attracts attention to the group.
and its works. The main reason for crisis is that the group attracts critics from both inside and outside. These critics may redirect the interests of the group.

Karl Popper (1972) offers still another viewpoint, that "science grows under the impetus of competing research programs which from time to time undergo 'progressive' or 'degenerative' problem shifts. The rational preference of scientists for programs where 'progressive' rather than 'degenerative' shifts occur results in scientific progress" (1972, p. 61). Popper also proposes that the aim of science is to grasp significant truths about the world, and to do this "we must formulate powerful theories" (p. 69). Therefore, if a theory is not strong enough to accomplish this purpose, it will disappear and be replaced by a stronger competing theory.

The collective nature of science is another important factor that needs to be considered in the formation of scientific knowledge. As Darwin Cartwright has noted, "The production of scientific knowledge is a collective enterprise in which each contributor builds upon the work of others, and the amount of time required to process empirical findings, to communicate them, and to permit others to access their significance sets severe limits upon the rate of progress that can be expected" (1979, p. 21).

This issue is important in determining how science and theory develop, and what factors are influential in their formation. Most social scientists who deal with the sociology of scientific knowledge believe that
science and the production of knowledge are not wholly objective, but are, at least, partly subjective. For example, Talcott Parsons offered an argument for this view, "Science is not simply a reflection of reality, but is a selective system of cognitive orientation to reality ...." (1951, p. 167). As Robert Friedrichs pointed out, value judgments enter into the selection of scientific problems (1970). Friedrichs focused on the phases of the research process that necessarily include value-judgment in his book *A Sociology of Sociology* (1970). These phases are selection of the problem, choice of concepts, preference among logical modes of inquiry, investment in a particular hypothesis, the level of significance, and whether one will select for the interests of non-scientists or only for one's own or those of one's subcommunity when faced with responsibility for applying the research findings. Friedrichs (1970) also believes that science in general and sociology specifically, includes value-judgment.\(^1\) More importantly, science also involves power relations at all levels of inquiry. Friedrichs states that, "Social research may simply play the role of an 'anxiety-reducing' ritual for the powers that be. That is, problem areas may be so selected that the

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\(^1\)According to Max Weber (1949), there is a definite distinction between value-judgment and value-interpretation. As social scientists, sociologists have to avoid making personal value-judgments about social phenomena and, in particular, they are not in a position to recommend courses of action to be followed. However, Weber also believed that sociology involves interpretation which itself may bring the sociologist's values to bear on the issue. The values of the social scientist determine which questions will be asked, which topic will be selected for investigation and which methods will be employed for gathering data. Nevertheless, Weber proposed value-neutrality in sociology and he insisted on objectivity in sociology.
research conducted is almost certain to render legitimate the activity in question" (Friedrichs p. 141).

Irwin Sperber (1990) uses a different terminology for analyzing change in science. He refers to a “fashion process” within the scientific community and society. Sperber notes that in science a “fashion process operates with considerable impact on the direction of social change as well as on sociological explanations of social change” (p. 16). The fashion process has two dimensions; it may affect science both externally and internally. This process, together with other forces, has an impact on the development of science, on deciding which theoretical models scientists use, fields of specialization, research methods, the criteria of validity, and the choice of research problems.

Finally, there is the perspective of the ‘strong programme” in the sociology of scientific knowledge, which emerged in England in the 1970s. David Bloor (1991), Barry Barnes (1976, 1982), and Harry Collins (1975) are leaders in this group. Bloor introduced the principle of reflexivity into sociology of science. The idea of reflexivity refers to the social construction of scientific knowledge. According to Bloor, the strong programme is concerned with the social causes that bring about scientific knowledge or a scientific belief system. The programme is impartial with respect to the truth, falsity, rationality, irrationality, success or failure of scientific claims. Collins
and Pinch (1988) have extended these ideas using a number of case studies of scientific controversy. One of the points they make is that empirical evidence used to support a particular theory or line of research on the frontier of a science is likely to be very controversial. Thus, scientists themselves will not agree on how to interpret empirical findings. As a result, different theoretical perspectives and research programs can co-exist—each with its own group of supporting scientists—since different camps have variant interpretation of similar or the same evidence.

1.3.2. THE SOCIOLOGY OF KNOWLEDGE

When we look at the other side of the coin, to the effect of external factors on the production of scientific knowledge, we can make use of the sociology of knowledge and ideas of its founder Karl Mannheim. In order to analyze knowledge, Mannheim (1968), began with the description of a system of belief, which precedes an identification of the social group defending those beliefs. Then, he focused on the kind of relation existing between the system of beliefs and the social group. However, Mannheim’s approach to knowledge also invites us to consider the impact of broad social processes.

Mannheim argues that social positions determine forms of knowledge. These positions are not necessarily class positions. For him, a number of
social groups or processes such as generation, sect, and class can be correlated with forms of knowledge. The sociological importance of the notion of generation is one of the necessary guides to an understanding of the structure of a social and intellectual movement. He defines generation as the social category whose unity is constituted by a similarity of location of a number of individuals within a social whole (1968). In this respect, generation is a concept similar to social class. Both concepts, generation and social class, refer to a similar location of a number of individuals in a social structure.

Another important term that we see in Mannheim’s works is competition, which he considers a central feature of human societies. He proposes that, in intellectual life, competition results from the desire for ideological hegemony. Every historical, ideological, sociological piece of knowledge is rooted in and carried forward by the desire for power and recognition of particular social group who want to make their own interpretations of the world. On this point, Mannheim emphasizes the importance of the meaning of cultural items and categorizes them into three levels of meaning as follows:

(1) Objective meaning, which can be grasped by the observer without any knowledge of the intentions of the participants. For that we need to know the system of beliefs (context and whole).
Subjective meaning, which can be apprehended from within by a knowledge of the actor’s intention and purposes.

Documentary meaning, which refers to the meaning documented or indicated by a particular action.

The third concept, documentary meaning seems to be key for Mannheim to solve the problem of constructing the system of beliefs because he believes that every cultural product has a documentary meaning that reflects a global outlook, or weltanschauung. Weltanschauung, a German term, means world view. By this term Mannheim refers to the set of beliefs that constitutes an outlook on the world characteristic of a particular group, social class, generation, or religious sect.

Manheim’s point that the production of knowledge involves competition by those seeking to dominate the market of ideas accords with the actual behavior of scientists. On this point, Sperber makes the observation that “[scientists] become academic entrepreneurs, devise strategies to market and package their ideas and services as though they were commodities, ...” (p. xiv).

Social factors influence the development of science. It is obvious that the relative importance of some problems rather than others and of some solutions rather than others on scientists’ agenda can be determined by institutional factors. For example, in the mid-1960s, democratic organizations
such as Students for a Democratic Society, the Black Panther Party, and antiwar coalitions challenged the use of university facilities for war research and 'counterinsurgency' programs in the U.S.. As Sperber explains "they were particularly hostile to those social and physical scientists who acquiesced in or expressed neutrality over such forms of oppression as racism, sexism, economic inequality, and the denial of civil rights within the academic community." (p. 12). After these protests, universities began to change their policies. For example, Stanford Research Institute weakened its ties to the Department of Defense (Sperber 1990).

Sperber argues that scientists can be considered members of the working class since they do not own and/or control the means of intellectual production, such as laboratories, academic offices, or survey research centers. When intellectual (scientific) productions are transformed into commodities in the market, scientists do not fully control their product because they are excluded from some aspects of the decision making process. Also, the need of scientists to make their products useful to non-scientific consumers may lead to the production of faulty scientific paradigms. Sperber suggests how this can happen: "Let us suppose that a newly submitted paradigm is not really new, improved, or useful at all, but only a facsimile of one with these qualities; let us suppose that a paradigm is
represented at 'the latest thing' and a 'breakthrough' with the imagery and trappings of novelty and significance." (p. 220).

Friedrichs relates these issues specifically to sociologists who become tools for vested interests:

As sociologists permit themselves to become tools in the struggle for power and legitimacy in the world at large, they find that they increasingly became the servant of the dominant economic and military interests of the day, for it is they who can afford the luxury of subtle persuasion and manipulation rather than the more brutal and direct weapons of social control such as the strike or boycott, sit-in or police action, which so quickly stir the public conscience (1970, p. 140).

It will not be wrong to agree with Sperber, "Although scientists subjectively perceive themselves as autonomous professionals, in fact, they are an important sector of the development of social products" (1990, p. 213). He points out that scientists are responsible for generating an ongoing new, improved, and useful paradigm which is incorporated directly or indirectly into the prevailing system of production, command, and control. Then he adds, "Scientists are under great pressure to 'deliver' on new and useful paradigms, not because of intellectual curiosity or science for its own sake, but rather because of the requirements of capitalist development in general and the translation of those requirements into the 'theoretical challenges' and the reward structure of the scientific community in particular" (Sperber p. 219).
Finally, the role of technological advance also has an impact on external social, economic, and intellectual conditions in the development of science. For example, the development and accessibility of computer technology has transformed data processing capabilities in all the sciences.

1.4. ISSUES FOR STUDY

The literature on the sociology of science and the sociology of knowledge suggests a number of issues for the present study.

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

- 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.

- Competition among social scientists, schools, and paradigms for resources such as research funds, prestige, and academic recognition may cause changes in the social sciences.
• Levels of funding and student interest can have important effect on paradigm development.

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

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

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

1.5. PLAN OF THE STUDY

The next four chapters are descriptive and analytic. They document the rise, popularity, and decline of sociometry. Chapter 2 focuses on the development of sociometry as a new approach under the leadership of Jacob L. Moreno. It relates sociometry to small group studies and provides a comprehensive overview of sociometry’s research methods and results. Chapter 3 shows how sociometry was related to wider trends in social
psychology. In this chapter, social networks analysis is discussed at length, not only because it is closely related to sociometry, but also because it has displaced sociometry in importance among sociologists in recent decades. In Chapter 4, support is given to the historical descriptions in Chapters 2 and 3 with an analysis of sociometric articles published from 1952 to 1989. A comparison of sociometric articles with social network articles provides clear evidence that social network analysis has replaced sociometry among sociologists. Chapter 5 contributes more evidence about the decline of sociometry. It describes the results of a survey of active sociologists who have published their sociometric research. Chapter 6, returns to the theoretical issues laid out in this chapter and discusses them in relation to the information that I have collected about the career of sociometry.
CHAPTER 2

SOCIOMETRY

2.1. INTRODUCTION

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

2.2. 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 another and toward one or more symbolic objects, and who posses an awareness of a 'we' or membership" (p. 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" (p. 3).

During the 1930s a number of professional specializations developed for small group research. 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.

2.2.1. GESTALT APPROACH AND SMALL GROUP STUDIES

Small group studies were indebted to gestalt psychology. Gestalt theory appeared early in the 20th century in psychology as an alternative to empiricist theories of perception and knowledge. The term, gestalt, is a German word that means pattern and form or configuration. According to gestalt theory, the functions of the various parts of a social entity are determined by the behavior and nature of the whole. Gestalt theory seeks to organize human and social phenomena in terms of larger units of analysis, rather than atomistically. The gestalt approach assumes that each person...
interprets and constructs a unique personal life. The gestalt approach also assumes that groups are living organisms and that they are unique.

During the 1930s many gestalt theorists came to U.S. to escape Nazi Germany. Three of them later became very dominant in the field of transpersonal psychology. They were Fritz Heider, Kurt Lewin, and Jacob Moreno. Heider used concepts from gestalt psychology in the psychology of interpersonal relations to develop his theory of balance and causal attribution. Cognitive dissonance and attribution theory in social psychology originated from Heider's work. Lewin established a research center at the Massachusetts Institute of Technology, and later moved to Michigan to found a center for social perception and group structure research. Lewin's book, *Principles of Topological Psychology* (1936), was the collection of his early work on group behavior. He stated in this book that group behavior was to be seen as determined by the field of social forces in which the group was located. For him a social group exists in a field, a social space that comprises the group together with its surrounding environment. He did not take the environment as external and independent of the group, because the environment that is important for the group is the perceived environment. Therefore, the group and its environment are elements within a single field of relations. For Lewin also structural elements of social space could be analyzed with the mathematical techniques (Lewin 1951). Lewin's field theory
aimed to explain the interdependence between group and environment in a relational system using mathematical terms. His topological approach took the social field as comprising points that are connected by paths. In these relationships, the points were individuals, their goals, and their actions whereas the paths were the interactional sequences that connected individuals and their attributes.

Moreno began to use psychotherapeutic methods to uncover the structure of friendship choices while at New York University. By using controlled observation and questionnaire techniques, Moreno and his colleagues aimed to explore the ways in which group relations served as both limitations and opportunities for group actions and for personal psychological development. Moreno’s work was rooted in a therapeutic orientation towards interpersonal relations that reflected his early medical training and psychiatric practice in Vienna. Through all his studies, he tried to investigate how psychological well being is related to the structural features that he termed social configurations. He formed these configurations from the concrete patterns of interpersonal choice, attraction, repulsion, friendship and other relations in which people are involved. He considered these configurations to be the basis of large scale social aggregates, such as the economy and the state. Moreno’s concern for the relationship between small scale interpersonal configurations and large scale social aggregates
validated the expression of some of the leading ideas of classical German sociology as found in the works of Weber, Tonnies, and Simmel. Moreno coined the term 'sociometry' to describe his approach to small group studies.

2.3. DEFINING SOCIOMETRY

Orhan Hancerlioglu (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 or measurable concepts. Moreno's definition of sociometry is not much different from that of Hancerlioglu's; "Sociometry is the mathematical study of psychological properties of populations; the experimental technique of and the results by application of quantitative methods." Also, "Sociometry is the science of group organizations" (Moreno 1969, p. 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. But the two sociometrists used sociometry in somewhat different senses. Moreno used the term in a narrower sense than Cahpin. 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.

Chapin (1940) defined sociometry as the “study and use of social measurements” and classified social measurements into three categories:

1. Psychometrics or psychological measurements.
2. Demogrametrics or measurements of large units of population.
3. Sociometrics, including (a) scales to measure the interaction process within social groups and (b) those that attempt to measure the family group and the home environment. Moreno’s use of sociometry fits best into Chapin’s third category.

Moreno developed several different approaches for sociometric research. First, there is a research procedure in which the aim is to study the organization of a group or groups. Second, there is a diagnostic procedure in which the aim is to classify the positions of individuals in a group or groups located in a wider community. Third, there is a therapeutic or political procedure that aims to help individuals or groups to achieve better
adjustment. Lastly, there is a complete sociometric procedure where all these approaches are united.

After the 1960s sociometry developed in three different directions according to differences in methodology: The first approach was called dynamic sociometry. J. L. Moreno, and H. Jennings represented this approach. The second approach is diagnostic sociometry. The main figures in this group included J. Criswell, 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. Interesting though these distinctions are, I will not deal with them here. My purpose is to consider sociometry as a whole and only deal secondarily with these and other distinctions.

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 behavior, 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 (individual versus group,
group versus group), research methods and their applications to small group research. Sociometry has often used for applied research in education, the military, industry and formal organizations where small group structures could be identified.

2.4. DEVELOPMENT OF SOCIOMETRY UNDER MORENO'S INFLUENCE

We need to look at Moreno's thought in more detail because he was very influential on the development of sociometry. 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. The founders of French Sociology were Auguste Comte, Pierre Proudhon, and Emile Durkheim. 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. The roots of
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 made a contribution. Although, Simmel, Von Wiesse, Gurwitch, and Moreno had conceptualized some aspects of sociometry and microsociology 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, he is the HOMO METRUM" (Moreno 1960, p. 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, p. 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; and, 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 general 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, *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, p. 198).
2.5. 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.

Howard Schuman, editor, comments on the change of title as follows:

Sociometry becomes Social Psychology with this issue, as resolved by the Council of the American Sociological Association. For those of us who have become attached to the former title (whatever its present descriptive inaccuracy), or who would have preferred a name change different from the new one (and there were several attractive alternatives), Social Psychology will take a while getting used to. But it does reflect the present nature of this journal, as measured by content, submissions, and readers. The front cover now carries a reminder of our former title, and a note on the inside of that cover acknowledges our history as Sociometry, founded in 1937 by J. L. Moreno, so that our origin and descent are not forgotten. We hope that the new title will be interpreted broadly in terms of substance, method, and type of article, as indeed the present issue to some extent illustrates; and that we can in future issues represent well the scope, variety, and importance of research and writing in social psychology (Schuman 1978).
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 behavior 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 (JPSP), 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.

Again Howard Schuman comments on this further change:

Beginning with the first issue of 1978 the name of this journal was changed from Sociometry to Social Psychology, ...This further change, ..., has been made simply to distinguish this journal more clearly from some others that include 'Social Psychology' as part of their title... None of these title changes—from Sociometry to Social Psychology, and then to Social Psychology Quarterly (and perhaps informally to SPQ)—reflects any change in the nature of the journal. The changes have simply matched the name more closely to the contents" (Schuman 1979).

2.6. BASIC TERMS IN SOCIOMETRY:

SOCIAL ATOM, TELE, AND SOCIOMETRIC STRUCTURE

The remainder of this chapter is devoted to an overview of sociometric concepts and research techniques. First, we will consider the basic terms in sociometry, most of which were crafted by Moreno. The basic terms are social atom, tele, and sociometric structure. We will see these concepts are interrelated.

According to Moreno, sociometry has three roots; socius (companion), metrum (measurement), and drama (action) (Moreno 1951). From these roots it focuses on three research areas; group research, metric research, and action research. By sociometry, Moreno proposed "to explore and treat the
laws of social development and social relations" (1951, p. 7). Although sociometry is considered a microsociological perspective, Moreno claims that sociometry aims to cover whole social categories. To investigate these categories, Moreno begins with social atoms, which are the smallest units of social organization. From this starting point, Moreno assumes that the full social structure can be seen as a totality and this totality can be studied in its smallest parts, namely individuals.

Social atoms (individuals) are in interaction with each other, participate in groups and link themselves with parts of other social atoms. These relations form complex chains of interrelation that are called networks by Moreno. In socialization processes, older and wider networks spread into individual contributions. Therefore, we can infer from this assumption that these networks have the function of social tradition and public opinion. These processes also shape individual behaviors, beliefs, and interrelations. The interrelations of individuals are shaped by attraction. Moreno conceptualizes attraction as tele. In other words, the flowing of feelings between constitutes tele.

Moreno defines tele as "the factor responsible for the degree of reality of social configurations as they deviate from chance. Also the smallest unit of social feeling measured by sociometric test" (1969, p. 44). The tele is used by Moreno as the cement that holds individuals and groups together. It has
certain functions such as group cohesiveness, reciprocity of relationships, communication and shared experiences. It may also be defined as a constant frame of reference for all forms and methods of psychotherapy. Therefore, it is the factor which is responsible for the increased mutuality of choices that surpass chance and for the increased rate of interaction between members of a group. It operates on four levels according to Moreno. They are the wish level, social desire level, choice level, and behavioral level of the relationship. Tele also has cognitive aspects (Moreno 1960, p. 17).

Tele as a process may be shown as different types. Some of the types are shown in the diagram below (Figure 2.1). The simplest tele is the attraction of A for B, which is responded by an attraction of B for A in the same life situation. If the attraction occurs between two persons, it is termed congruous. To be more explicit, A chooses B first, and B chooses A first. If the attraction between two persons occurs on different levels of preference then it is termed as incongruous. In other words, A chooses B first but B chooses A second or third.

On the other hand the attraction of A for B may not be for B’s real ego, but for his alter ego, for some role or symbol which s/he represents. This is called symbolic or role tele. Another type of tele is object tele. A is attracted towards an object that is in turn useful to her/him. In all these cases, the
**Figure 2.1: Tele Charts**

Simple Tele

Simple Tele (Congruous)

Simple Tele (Incongruous)

Symbolic Tele

Object Tele

Infra Tele for persons (Unreciprocated but positive attractions toward a real ego or a real role)

Infra Tele for an object.

Transference to persons.

Transference to objects.

Transference relations among 3 persons, belonging to A group.
attraction is positive from both sides whether both sides are the two egos of two persons, two roles of these two persons, or a person and an object.

Moreover, a form of attraction can take place that is positive for one person but not shared by the other person. This is called as unreciprocated tele. A chooses B, but B does not choose A. A chooses B in a certain role. B does not choose A either as an ego or in any role. This is called infra tele. There is an infra tele for objects as well (Moreno 1960, p. 47-49).

2.7. DATA COLLECTION AND ANALYSIS IN SOCIOMETRY

A difference in data collection methods was one of the important factors that led to the disciplinary split in social psychology. Psychological social psychology mostly used experimental methods, and sociological social psychology relied on field observation together with mailed questionnaires, telephone interviews, personal interviews, and administered questionnaires.

The early development of sociologically-oriented sociometry was done in the field. Sociologists wanted to study populations in their actual settings. On the other hand, laboratory techniques were used widely by psychologically-oriented sociometrists. Experimental studies maximize the researcher’s control over possibly confounding variables, and permit singling out particular variables for study. Especially after 1950s, experimental
techniques became the most widely used method in psychologically-oriented sociometry.¹

The major sociometric technique is the sociometric test. Other techniques are the sociogram, acquaintance test, index and diagram, sociometric index, sociomatrix, role test (index and diagram), interaction test (index and diagram), spontaneity test, quotient and scales, psychodrama (recording and process analysis), and sociodrama (recording and process analysis). I will deal briefly with some of the techniques.

2.7.1. THE SOCIOMETRIC TEST

The sociometric test is intended to measure the amount of organization in social groups (Moreno 1960). It is designed to give an objective picture of the relationships between the members of any group of people, by indicating the attraction and repulsion between the individual members. The general method is simply to ask each member of the group to indicate which other members s/he would like to have as companions for a particular activity or occasion, and which s/he would dislike having as companions for that activity or occasion.

According to Moreno, the information requested should relate to a real situation that would be acted upon. Otherwise it would be not a true sociometric test. If the situation is hypothetical and no action on the results is contemplated, then it was termed "near-sociometric". On this point, Cornwell (1958) said that the near-sociometric test might be more useful as a research instrument than a true test with large groups where there would be a practical difficulty with getting respondent's choices for a real situation.¹

2.7.1.1. Representation of Sociometric Test Results

Representing test results constitute an important part of the sociometric procedure. To represent test results sociometrists use some general terms in order to make their results more understandable. The terms include: star, isolate, neglectee, rejectee, mutual choice, sociometric clique and sociometric cleavage. It will be seen that each of these terms describes a type or configuration of interpersonal relationships.

Star refers to an individual who receives a large number of choices on a sociometric test. Branfenbrenner (1945) defined the term specifically "a star

¹ The information which is obtained from a sociometric test includes three important things according to Northway (1962): first, "the sociometric status scores, their variations and distributions;" second, "the relationships among the individuals in the group, the types of relationship and the individuals in the group, the types of relationship and the classification of these into reciprocated choices, indifference, one way choices, chains;" and third, "the structure of the group as a whole, which is discovered from the distribution of the scores and relationships among the individuals" (Northway 1962, p. 41).
was any individual who received more choices on the sociometric test than could be expected by chance alone" (p. 63).

The isolate is an individual who receives no choices on a sociometric test. Although s/he is a physical member of the group, s/he is psychologically isolated from the other group members. Sometimes, this type of group member was called an “outsider” or a “social island;” but the use of these last terms were less common than isolate.

Neglectee identifies the individual who receives relatively few choices on the sociometric test. S/he may receive some choices, but s/he tends to be neglected by the majority of the group members. Branfenbrenner (1945) defined this term as “a neglectee is any individual who receives fewer sociometric choices that can be expected by chance” (p. 64). A neglectee is also called “fringer” because s/he is located on the fringe of the group.

The rejectee is an individual who receives negative choices on a sociometric test. Negative choices result from a sociometric question that asks individuals to indicate those whom they least prefer for a group activity. The rejectee is different from the isolate. The isolate receives neither positive nor negative choices on a sociometric test. S/he is truly isolated from the group. On the other hand, the rejectee may receive no positive choice from group, but s/he receives negative or rejection choices. Thus, s/he attracts some attention from group members, but the attention is in the nature
of a rejection. To indicate a rejectee, sociometric test must include some negative questions. Therefore, if there are no negative questions in a sociometric test, the isolates may include some unidentified rejectees.

The term mutual choice indicates that two individuals have chosen each other on the same sociometric criterion. This is also called as a reciprocated choice, or a pair. The important aspect of mutual choice is that the choice must be reciprocated on the same criterion. Thus, it indicates a mutual desire to associate together in the same group activity.

The sociometric clique identifies a number of individuals who choose each other on the same sociometric criterion, but give relatively few choices to individuals outside their closely knit group. Thus, a sociometric clique is a subgroup within the larger group.

The sociometric cleavage refers to the lack of sociometric choices between two or more subgroups. An example of a sociometric cleavage may be persons of different races; for example, if African-Americans rarely choose whites and whites rarely choose African-Americans. In addition to a racial cleavage, the sociometric test may reveal gender and socioeconomic cleavages among others.
2.7.1.2. The Validity and Reliability of Sociometric Tests

The sociometric test is different from a psychometric test. A psychometric test is designed to elicit a sample of behavior from which the possession of certain psychological characteristics or likelihood of related behavior can be inferred. The sociometric test, on the other hand, is designed to elicit social behavior. If it correctly elicits social behavior then the sociometric test is a valid measure of that behavior. If the test draws out a true sample of behavior and the choices are real ones for the situation in which the subject will have to associate with those s/he chooses, the probability is that the test will be valid. If the situation is hypothetical or near-sociometric, then there is a greater chance of falsification. On this point Moreno insisted on the need for a true sociometric test rather than a near-sociometric test when studying group structure (Northway 1962).

The time dimension is of concern in determining the reliability of the sociometric test. If a sociometric test is repeated after a short time period, the result may be affected by the high reliability of memory. This would tend to produce a spuriously high reliability coefficient. If the test is redone after a long time period, the instability of behavior may produce a spuriously low reliability coefficient. There are also other difficulties likely to be encountered in repeating a sociometric test. Because even in stable groups there will be some changes, such as some members may leave the group, some new
member may enter the group, some events, such as holidays, may interrupt the group life. All these events and others may affect the stability of the choices (Grondlund 1959).

The other method of measuring test reliability, the split-half method, is also not completely satisfactory. To be successful in its application, the test must be split into two precisely equivalent sections. Where the sociometric test is concerned the question immediately arises as to what are equivalent samples of choice behavior. Thus, there are no absolutely satisfactory answers in determining reliability in sociometric testing (Evans 1966).

2.7.1.3. Sociometric Criteria in Sociometric Tests

The selection of the criteria of choice is a major consideration in the development of a sociometric test, according to Grondlund (1959). Choice criteria may be general or specific, strong or weak, actual or hypothetical, personal or social, and two-way or one-way. Which types of criteria to select for a sociometric test depends mainly on the purpose of the test and the opportunities for social interaction available to group members. In general, certain rules should be followed when selecting sociometric criteria. First, the criteria must clearly indicate the nature of the activity or situation; second, the criteria must be familiar and realistic to group members; third, they must be general enough to minimize external factors; fourth, they must be based on
fundamental and permanent relationships; lastly, the criteria must provide for reciprocal choice and mutual association among group members (Moreno 1960).

A general criterion indicates an activity but does specify the particular basis of interaction. Most widely used criteria in this category are those which are based on choice of seating companion, work companion, and play companion. The choices on general criteria imply a desire for social proximity in major areas of the respondent’s life. In contrast to general criteria, specific criteria indicate a very limited basis for social interaction, such as choice of associates to work on mathematical problems, to play basketball with, and to dance with. However, the nature of such specific criteria often restricts the interpretations that can be made of the sociometric results (Grondlund 1959).

Strong and weak criteria are related to general and specific criteria, but have some differences. A strong criterion indicates a more basic and permanent relationship existing in a group. A weak criterion reflects the superficial aspects of group structure (Moreno 1960). The careful choice of the right situations is necessary in order to detect strong criteria. Weak criteria tend to be based on temporary situations or are concerned with activities where choice of associates holds little interest for the group members (Moreno 1960). Sociometric results based on weak criteria usually have little value and may be easily misinterpreted. Another criterion is the
actual or hypothetical nature of sociometric test. The main distinction between these criteria is whether the situation is real or fictional.¹

The last criterion concerns whether the relation is two-way or one-way. Two-way criteria indicate mutual association. Common examples of two-way criteria are a friendship or a marriage. On these criteria, individuals can choose each other for the same activity and form a mutual relationship. On the other hand, one-way criteria do not indicate choices for mutual relationships or associations. For example, placing individuals in leadership positions involves one-way criteria.

2.7.2. THE SOCIOGRAM

The best known method of representation of the results of a sociometric test is the sociogram. There are several types of sociogram, but all depict in diagrammatic form the relationships between individual members of the group. The individuals composing the group are represented by small circles and triangles. Sometimes initials or some other symbols may be used to identify the individuals. Lines joining the circles and triangles show choices

¹ Still other criteria refer to personal or social aspects of intragroup relations. According to Jennings (1947), there may be two aspects of group structures: one is based on personal criteria related to diffuse informal situations; and the other one is based on social, (less personal) criteria that are related to more formal, goal-directed situations. Examples of personal criteria are choice of seating companions or roommates. On this criterion there are no goal-directed activities that formally specify intragroup relationships. In contrast social criteria reflect common goal-directed activities, such as working together on a group project where individual roles are formally specified. The first type of group is termed a psycho group; the second type is termed a socio group (Moreno, 1960).
and rejections that are made by individuals. There are many types of lines used to identify relationships. For example, colored lines were mostly used by Moreno, red lines for attraction, black lines for rejection, and dotted lines for indifference. Some sociometrists use a continuous line for attraction and a broken line for rejection. Arrow heads being used to show the direction of feeling. Figure 2.2 represents attraction and rejection.

Sometimes to make the sociogram more detailed and explicit, the level of attraction or rejection is shown. This can be done either by using different colors for the first, second, and third choices or by writing the ranking of the choice beside the line. Figure 2.3 shows levels of choice. In this figure, A gives his/her first choice to B, second to C, and third to D.

Since asking people about whom they dislike poses difficulties for the researcher, most sociograms in fact only show attraction structures. In this kind of sociogram, it is usual to assume that if there is no line linking two individuals, they are indifferent to one another, although they may actually be antagonistic.

If groups are very small, drawing a sociogram is not so difficult; and the resulting sociogram is easy to read and interpret. Figure 2.4 shows a sociogram of the choices of a small group of individuals. However, if the
Figure 2.2: Representation of Attraction and Rejection.

A is attracted to B.

C rejects D.

Figure 2.3: Level of Choice.

A gives the first choice to B, second choice to C and third choice to D.

Figure 2.4: Sample Sociogram.
group is large, then it is more difficult to draw the sociogram. For clarity, it is especially important to keep the crossing of lines to a minimum. According to Moreno (1960), where there are more than thirty individuals in a group it is difficult to draw a good sociogram. It is also difficult to draw a good sociogram if a large number of choices is permitted to each individual. Thus, it is useful to restrict the choices to three or less. Figure 2.5 illustrates a number of typical structures that are found in sociograms.

In most groups, there will be a few individuals who are not chosen by anyone else. These are often referred to as isolates, but there is a distinction between the true isolate, who is not chosen and him/herself makes no choices, and the neglectee, who makes choices but is not who him/herself chosen by anyone else. A third term sometimes used is the rejectee, which signifies the person who is not only isolated but is also actively rejected by other people. Figure 2.6 shows the types of isolation: true isolate, neglectee, and rejectee.

2.7.2.1. Advantages and Disadvantages of the Sociogram

The main advantage of using a sociogram to show the relationship in a small group lies in the ease with which it can be understood. No technical knowledge is necessary and the information is obvious at a glance. (This is not the case if the information is given in the form of tables or statistical
**Figure 2.5:** Typical Sociogram Structures.

*Mutual pair:* A is attracted to B and B is attracted to A.

*Chain structures:* It may or may not involve mutual attractions.

*The triangle:* It shows the attractions between individuals who form cliques within the whole group.

*The star:* A number of individuals are attracted to one person who may or may not reciprocate their choices. This individual is usually called a 'star' from the shape of the structure surrounding him/her.
indices.) Moreover all the relationships in any one group are presented at one and the same time. Additionally, sociograms nearly always arouse considerable interest in those to whom they are shown, an advantage when the sociogram is being used for education, the military, formal organizations, and industry.

The sociogram, however, has some disadvantages. First, it is not easy to draw sociograms for large groups or where a large number of choices is allowed. Second, the lay-out of the sociogram may also affect the information it conveys, and social nearness may be confused with nearness in the diagram. Various authors have made suggestions on improving sociograms.

Proctor and Loomis (1951) distinguished six possible types of interpersonal relationships between two individuals, a and j.

- Type A, a chooses j, and j chooses a
- Type B, a chooses j, and j ignores a
- Type C, a chooses j, and j rejects a
- Type D, a ignores j, and j ignores a
- Type E, a ignores j, and j rejects a
- Type F, a rejects j, and rejects a

They suggest that these types of relationships can be arranged along a strong-tie-strong-aversion continuum. Figure 2.7 illustrates this continuum. Although Proctor and Loomis acknowledged that it is not satisfactory to equate types C and D in this way, they saw no logical alternative at the time. However, some practical difficulties make it impossible to use this procedure.
Figure 2.6: Types of Isolation.

C is a true isolate neither making nor receiving choices.

F is a neglectee. F chooses D and E but is not chosen by either of the other two.

J is rejectee. J chooses G but is rejected by both G and H.

Figure 2.7: Aversion Continuum.

Strong tie

1 2 3 4 5

Lack of mutual tie or aversion.
For example in order to do this for all the members of a group a multidimensional space may be needed. The sociogram is limited to a two-dimensional representation.

Borgatta (1951) proposed an easier method for drawing a sociogram. In this method the number of lines is minimized and subgroups are made apparent. He began by picking out two, three or four persons who are most chosen. Then he placed them in well-separated positions on a large sheet of paper. Three persons should be placed to form a triangle, four to form a square. Later, the relationships of these people are indicated, and their positions shifted so as to reduce the number of crossing lines. Mutual choices are shown by a double line. Next, place the remainder of group on the diagram by beginning with the people who made fewer choices, and last of all isolates at the bottom of the diagram. This procedure minimizes crossing lines. The subgroups can be identified by inspection and shifted so that they became obvious and persons who served as channels of communication between them can be seen. Finally the diagram is re-drawn, by using smaller symbols and on a smaller scale, making the subgroups appear as tighter units and making the diagram more readable.

Northway (1940) suggested a variation on the sociogram that he called it the target sociogram. A target sociogram consists of four concentric circles in which individuals are placed according to the number of choices
they receive. The most frequently chosen are placed in the innermost ring and the least chosen in the outermost. Groups are divided into quarters according to the numbers of choices received. Figure 2.8 shows a target sociogram.

The main advantage of the target sociogram is that it enables the over-chosen and under-chosen members of a group to be identified at a glance. While the over-chosen can be identified easily in the ordinary sociogram by the star shaped configuration of choices surrounding them, the under-chosen are not easy to identify. The target sociogram makes it easy to be sure that all under-chosen and over-chosen individuals in a group are identified and that none have been overlooked.

2.7.3. THE SOCIOMATRIX

There is an alternative to the sociogram as a method of displaying sociometric data; it is called the sociomatrix. E. Forsyth and L. Katz (1946) describe how to create a sociomatrix. They begin by tabulating the choices and rejections of a group of $n$ individuals in an $n \times n$ matrix. Normally self-choices are not made and this is shown by placing x's or drawing a line along the main diagonal. Positive choices are shown by a plus sign (+) and negative choices are shown by a minus sign (-). Thus, if the fifth individual
Figure 2.8: Target Sociogram
chooses the ninth a + is put in the cell at the intersection of the fifth row and the ninth column. Following this procedure all the choices and rejections made in the group can be shown. A blank cell may be used to show indifference (see Table 2.1).

The sociomatrix is obtained by rearranging the rows and columns of the matrix of raw data so as to make the structure of the group apparent (see Table 2.2). The first step is to select any two people between whom there is a positive mutual choice. Their rows and columns are then shifted so as to bring them to the top left-hand corner of the matrix next to one another. If any other individual is chosen by both the first two s/he will now be found to have a pair of +'s in the first two rows. His rows and columns are then shifted to third place, in order to make them adjacent to those of the first two. If there is no one chosen by the first two, search is made for anyone who chooses them. If s/he is also chosen by one of them his/her rows and columns moved to become part of their group. This process of rearrangement is continued on the principle that anyone who is chosen by at least half of the members of the subgroup may be added to it. If no further persons can be found satisfying this criterion, the subgroup is considered to be complete.
Table 2.1: Choice Matrix for 22 People. Three choices are allowed. @ indicates reciprocated choices.

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Table 2.2: Ordered Choice Matrix for 22 People.

|   | 7  | 8  | 11 | 10 | 13 | 19 | 2  | 16 | 18 | 22 | 5  | 12 | 20 | 15 | 14 | 17 | 1  | 3  | 9  | 6  | 21 | 4  |
|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 7 | @  |  + |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 8 | @  | @  | @  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 11| @  | @  | @  | @  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 10| @  | @  | @  | @  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 13| @  | @  | @  | @  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 19| +  | @  | @  | @  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 2 | +  | @  | @  | @  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 16| +  | +  | @  | @  | @  | @  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 18| +  | +  | @  | @  | @  | @  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 22| +  | +  | +  | @  | @  | @  | @  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 5 | +  | @  | @  | @  | @  | @  | @  | @  |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 12| +  | @  | @  | @  | @  | @  | @  | @  | @  |    |    |    |    |    |    |    |    |    |    |    |
| 20| +  | +  | +  | @  | @  | @  | @  | @  | @  | @  |    |    |    |    |    |    |    |    |    |    |
| 15| +  | @  | @  | @  | @  | @  | @  | @  | @  | @  | @  |    |    |    |    |    |    |    |    |
| 14| +  | +  | +  | @  | @  | @  | @  | @  | @  | @  | @  | @  |    |    |    |    |    |    |    |
| 17| +  | @  | @  | @  | @  | @  | @  | @  | @  | @  | @  | @  | @  |    |    |    |    |    |    |
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| 9 | +  | @  | @  | @  | @  | @  | @  | @  | @  | @  | @  | @  | @  | @  | @  | @  |    |    |
| 6 | +  | @  | @  | @  | @  | @  | @  | @  | @  | @  | @  | @  | @  | @  | @  | @  | @  |    |
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A second subgroup is built up in the same way, starting with two individuals making a positive mutual choice and not included in the first subgroup. By this way a series of subgroups is built up, and a number of individuals remain who do not belong to any subgroup.

In some cases the sociomatrix has some advantages over the sociogram. The sociogram depends very much on the person drawing it. On the other hand, different researchers will produce a similar or identical matrix. Complex structures are more easily identified from the sociogram; they are more difficult to see in the matrix, but the sociomatrix has the advantage of being able to represent larger more complex groups for which the sociogram would be very confusing. As a result, the sociogram and sociomatrix are considered complementary rather than opposing ways of showing sociometric data. Figure 2.9 shows the sociogram based on the same data for 22 people as in the sociomatrix (in Table 2.2). (For more information about the analysis and interpretation of sociogram and sociomatrix, see Appendix B.)
Figure 2.9: Sociogram for Choices of 22 People.
2.8. SUMMARY

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 centered 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 center 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 chapter.
CHAPTER 3

SOCIOMETRY AND RELATED APPROACHES

3.1. INTRODUCTION

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. I will also discuss two approaches that are closely related to sociometry—graph theory and social network analysis. 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.
3.2. CRISIS AND THEORETICAL SHIFT IN SMALL GROUP STUDIES AFTER THE 1950s

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 1964).

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) Festinger, Schachter, Bach, Thibaut, Kelly, and Brehm focused on personal construct theory. (3) Caster and Lanzetta were interested in equity problems that focus on determining the rates of return for certain activities under specific conditions. (4) Lewin, Lippitt, Zader, and Cartwright were interested in leadership and used experimental psychology. (5) Bales, Borgatto, Hare, Mills, Slater, and Strodtbech, 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 Strodtbech 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 1945-49, 10 percent between 1950-54, 9.6 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.

I will now discuss some specific approaches and their relation to sociometry. We will see that sociometry contributed significantly to these approaches as they did to it. But, in the end, several of these approaches were more appealing to sociologists than sociometry was.
3.3. GRAPH THEORY, BALANCE THEORY, SOCIAL NETWORK THEORY AND SOCIOMETRY

Graph theory is the field of mathematics that studies the arrangements of points (or nodes) and lines. Graph theory has been used to describe linkages among social actors and to manipulate these representations to investigate the underlying structures of social systems. In sociological applications, the nodes represent individuals, roles, or organizations. The links are social relationships such as kinship, friendship, work relations, etc. With graph theory, the use of matrices entered into sociometric studies and social network analysis. Matrices made it possible to study many more members of social systems and many more types of ties. Later, developments in computing made it easier to analyze complex structures such as cliques, central members, and indirect linkages.

Graph theory was first formulated in 1936 by Konig in Germany, but his ideas came to the attention of US sociologists in the 1950s and were developed by Harary and Norman (1953). Graph theory played the role of a bridge between the individual and the group. In other words it allowed a shift in attention from a cognitive balance to interpersonal balance. Therefore, we can consider this shift the first step from a purely psychological conception to a sociological conception in small group studies. After that, researchers began to study graph models of the systematic interdependence between the
attitudes held by different individuals within a group. Cartwright, Zonder, and Harary began to construct models of group cohesion, social pressure, cooperation, power and leadership by the graph perspective. The relevance of graph theory for Moreno's sociometric approach was apparent.

Graph theory consists of a body of mathematical axioms and formulas to describe the properties of the patterns that are formed by nodes and lines. The points in a graph represent individuals and the lines show their relations with each other. The lines are signed (+) or (-) to indicate whether they refer to positive or negative relations. Moreover, arrows can be used to indicate direction of the relationship.

Figure 3.1 shows a graph of relations among four actors. In the graph, actors A and B, A and C, B and C, and B and D have a positive relationship to one another; and actors A and D, C and D have a negative relationship.

Together with graph theory, some small group researchers used balance theory. Balance theory describes the affective, positive or negative, links among individuals or groups in a network. By doing this it examines the compound effects in each constituent triad. If the product of triad links is positive then it is balanced, if the product of links is negative then it is unbalanced. Balance theory simply tries to prove that if all triads are balanced then the system is polarized into two groups. Cartwright, Harary
and Newcomb tried to combine graph theory and balance theory in their small group studies.

Heider's Balance Model was the earliest form of balance theory. Heider was a psychologist and he used sociometry in his studies. His theory influenced Lewin and Gestalt psychology. Heider's main proposition was that a person's perception of the objects in his/her environment as formed a unified whole. Heider suggested that, under given conditions of balance, the focal person experiences little tension, therefore his/her orientation is not likely to change. By contrast, under conditions of unbalance, the person will experience relatively more tension and thus change his/her orientation in the direction of less tension or greater balance (Taylor 1970, p. 19).

For Cartwright (1977) complex social structures are built from simple structures such as triads. To be more explicit, complex social structures are composed of overlapping triads. Figure 3.2 illustrates this. The figure shows three different graphs of relations among individuals. In the first graph, A and B, A and C, and B and C have a positive relation, which means that the graph is balanced. In second graph, on the other hand, a negative relation between A and C makes a strain on the positive relation between A and B, because there is a positive relation between B and C. Thus, the graph is unbalanced.
Figure 3.1: Graph of Relations Among Four Actors.

Figure 3.2: Balanced and Unbalanced Structures.
The third graph represents another balanced relationship, because A and B have positive relations each other, and both have negative relations with B. Thus, no relationship is under strain due to a lack of balance.

Cartwright (1977) argues that simple triadic structures are the building blocks of larger social structures. Therefore, the properties of complex networks of larger social structures can be derived from an analysis of these building blocks. These types of studies claim to reduce the whole of society into small group properties. Cartwright concludes that a whole network is balanced when all of its component triads are balanced. To determine whether if is balanced, Cartwright divides a larger network into two subgroups regardless how large or complex they are. He suggests that the relations within each of these sub-groups will be positive while those between the subgroups will be negative. Thus, a balanced social network will consist of two cohesive sub-groupings between which there is conflict and antagonism.¹

Graph theory provides numerous theorems and algorithms for sociometric researchers. For example, density in graph theory describes the general level of linkage among the points in a graph. If more points are

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¹ There are several graphs commonly used by graph theory. One is called a binary graph where a link either exists or does not. The second one is an asymmetric graph, used for special cases of interest such as to represent tournaments. Third is an ordered graph used for organizational structure. Signed graphs used for structural balance. These types of graphs are especially used by balance theory that describes the positive and negative links between individual and groups in a network. A last type is the stochastic graph used for links which express the probability of relationships.
connected to each other, then the graph will be denser. In general, density depends on other characteristics of a graph. The first is inclusiveness, meaning the number of connects points that are included within the connected parts of the graph. The inclusiveness of a graph, then, is the total number of points minus the number of isolated points. For example, a 30 point graph with six isolated points may have an inclusiveness of 0.80 (24/30=0.80). If a graph is more inclusive then it will be more dense (Snijders 1981).¹

¹ A formula is used to measure density. This formula involves comparison of the total number of points that are present in a graph with total number of lines. The maximum number of lines is calculated from the number of points that it contains. Each point may be connected to all except itself. Then, an undirected graph with n points may contain a maximum of n(n-1)/2 lines. Calculating n(n-1) gives the total number of pairs of points, and the number of lines connecting these points are the half of the total. For example, a graph with five points can have a maximum of ten lines, and 50 points graph can have 1225 lines (Scott 1991). Then the formula for the density of a graph, which was defined as the number of lines in a graph, is \( \frac{l}{n(n-1)/2} \) where \( l \) is the number of lines present. The density is also be expressed as \( (\sum d) / n(n-1) \).

In a directed graph the calculation of density is different because the matrix for directed data is asymmetrical. A directed line from A to B does not necessarily involve a reciprocal line directed from B to A. That is why the maximum number of lines is equal to the total number of pairs that it contains. Then the formula will be \( n(n-1) \), and the formula for density is \( \frac{l}{n(n-1)} \) (Mitchell 1969; Scott 1991).

Density can be easily calculated for directed and undirected graphs, but it is very difficult for valued data. It also varies with type of relation and with the size of the graph. That is why it is not used for comparisons across networks that vary in size (Mayhew and Levinger 1976). Despite this limitation, the density measurement is important for both sociometry and social network analysis (Wellman and Berkowitz 1988).
3.4. SOCIAL NETWORK ANALYSIS:  
SOCIOMETRY'S SUCCESSFUL SIBLING

In the previous chapter, I mentioned the relationship between social network analysis and sociometry. In this part, I will explain social network theory in more detail and its relations to sociometry. Social network analysis is a particular set of methods that has emerged to analyze social structures. The methods are specially aimed at the relational aspects of social structures. Network analysis can be used to study relations between individuals, or sometimes collectivities and roles. Kinship, communication, friendship, and authority are some examples of the kinds of relational links in social networks.

Network analysis uses the sociogram and sociomatrix, derived from sociometry, to show relationships. It also uses graph theory that was also pioneered in sociometry. The main difference between network analysis and sociometry is that network analysis concentrates on structural characteristics, such as bridges (persons who form the only link between strongly connected groups), balance (the tendency of highly cohesive groups to polarize), and more refined definitions of cliques (a small and exclusive group of people). In contrast with this, sociometry tended to focus exclusively on interpersonal attractions within small groups.
3.4.1. THE DEVELOPMENT OF SOCIAL NETWORK ANALYSIS

Network analysis developed after the 1950s and became increasingly important during the 1970s. During 1960s, social network analysis was influenced by mathematical sociology and became much more theoretical under the leadership of Harrison White. It has its own journal, Social Networks, which began publication in 1977.

Social network ideas first developed in a relatively non-technical form in the work of the anthropologist Radcliffe-Brown. From the 1930s to the 1970s a number of sociologists and anthropologists used and developed Radcliffe-Brown's concept of social structure or the web of social life. However, after the 1950s small-group researchers began to concern themselves with devising more formal models of social networks. From the 1970s a number of technical approaches and specialist applications appeared in this area.

Scott (1991) divides social network analysis into three main lines. The first, sociometric analysis, produced many technical advances by using the methods of graph theory. The second line of the development was the result of the Manchester anthropologists who built on the work of Radcliffe-Brown and on formal modeling techniques to investigate the structure of community relations in tribal and village societies. The third line consisted of Harvard researchers who studied patterns of interpersonal relations and clique
formation. I want to add to this list a fourth line of development, the structural network analysis that developed in the US after the 1960s which provided an alternative to existing social network studies. Although this fourth line originated at Harvard, it was also developed independently in Canada in a unique way. It was different from other social network studies in several ways. I will mention these differences while explaining the structural social network approach.

Since I have already discussed sociometry in the previous chapter, the following discussion focuses on the Manchester and Harvard social network traditions and finally on the structural social network approach.

3.4.1.1. The Manchester Social Network Tradition

Social network analysis began to take on a general shape at Manchester University in England during 1950s. The most influential figures were John Barnes, Elizabeth Bott, Clyde Mitchell, and Max Gluckman. They were influenced by the ideas of anthropologist A. R. Radcliffe-Brown. The Manchester social anthropologists saw social structure as networks of relations and combined formal techniques of network analysis with substantive sociological concepts. The Manchester studies used a conflict theory emphasizing interpersonal relations. This is the main distinctive feature of the Manchester social network tradition. They emphasized conflict
and change rather than Harvard University’s emphasis on integration and cohesion.

The Manchester network analysis used networks as an analytical rather than a metaphorical concept as early as the 1950s. Their approach has two distinct attributes according to Mitchell. The first was "... a growing dissatisfaction with structural-functional analyses and the search, consequently, for alternative ways of interpreting social action" (Mitchell 1969, p.1). Second "... the development of non-quantitative mathematical ways of rigorously stating the implication entailed in a set of relationships among a number of persons" (Mitchell 1969, p.1).

In the early 1950s, Barnes and Bott began to work on social networks in a more analytical way. In their studies the concept of social network was used to meet the need for appropriate concepts to understand complex societies. Later, Mitchell laid the basis for a mathematical approach to social network analysis by using graph theory that had emerged from the early sociometric studies. He then formulated these ideas as the basis of a sociological framework. Mitchell set out a body of sociological concepts to explain structural properties of social organizations. In this way, he translated graph theory and sociometry into a more sociological framework. Furthermore, he conceptualized the total network of a society as “the general ever-ramifying, ever-reticulating set of linkages that stretches within and
beyond the confines of any community or organization" (p.12). In actual research he found it necessary to select a particular aspect of the total network of society. He defined these particular aspects as partial networks. He used two kinds of abstraction in thinking about particular networks. First, a particular individual generates an ego-centered network of social relations. Second, there are the global features of networks that are observed in a particular social activity.

Most of the social network researchers focus on the first kind, namely *individually anchored partial networks*. This kind of research identifies individuals and indicates their direct and indirect links to others. The partial network studies by sociologists and social anthropologists are usually ego-centered networks that focused on particular types of social relationships such as marriage, neighborhood, and friendship.

Mitchell and Barnes (1969) formulated other concepts and brought them into social network studies. They derived these concepts from graph theory and brought these into sociological terminology to describe the texture of networks. One concept was density, which was discussed earlier. Another concept was reachability, referring to how easy it is for all people to contact one another through a limited number of steps. Other concepts were clique and cluster, used to identify social grouping within networks.
3.4.1.2. The Harvard Social Network Tradition

Harrison White and his colloquies began to study social networks at Harvard University and became influential in this area during the 1960s. In their works, they established social network analysis as a method of structural analysis. What was most distinctive about their approach was algebraic modeling and using set theory to analyze network relations. This was a kind of recasting of the early graph theory. They also used algebraic methods to model the ‘role’ concept in social structure. The second innovation was the development of multidimensional scaling. This scaling technique was used to translate relationships into social distances and to map them in a social space.

Harvard was where a basic networks approach was elaborated during the 1960s. The Harvard Group developed a mathematically-oriented structural analysis, and they were concerned with all kinds of social structural models. Although there was no single dominant theoretical viewpoint, the researchers were united by a common subject, used algebraic ideas, and network analysis as a method.

In 1970s, Granovetter was a main figure in this tradition. Granovetter's studies were not explicitly algebraic but they became important because they had substantive and analytical continuity with earlier sociometric work.

To explain his findings Granovetter drew on an information diffusion model, which was basically a sociometric model. This model was based on the idea that when a whispered message is passed along a line of people, the amount of information is reduced with each step in the chain. Because of this, those who are removed from the source are unlikely to receive accurate information about the job opportunity. The acquisition of information depended on both the strategic locations of a person's contacts in the overall flow of information and the motivation of those with information to pass it on (1974, p.51-52). Granovetter introduced his well-known idea “the strength of weak ties.” Strong ties, exist between persons who have many overlapping contacts with each other that are both direct and indirect. They tend to know and to interact with each other in different situations. Thus, there is a tendency to pass the same information from more distant parts of the network. It is through the relatively weak ties of less frequent contacts that different information is likely to become available. Granovetter found weak ties to be a vital source of information in searching for a job.

Granovetter used simple frequency tabulations to describe network processes. He made qualitative comments on the structure of the network
relations. According to Scott (1991), his studies contributed to the systematic and analytical development of social network analysis.

During the 1970s, Harvard yielded its dominance to the International Network for Social Network Analysis (INSNA) was founded and centered in Toronto. This institution acted as a nexus for the development of social network analysis under the leadership of Wellman and Berkowitz at end of the 1970s and during the 1980s.

3.4.1.3. Structural Social Network Analysis

Structural analysis began to develop in the US during the 1960s, but its roots go back several decades before this. After the Second World War, the cumulative effect of reading the translated works of European sociologists stimulated interest in the US about how the size of social systems and the ways in which relationships are interconnected affect individual behavior and dyadic exchange. This structural focus caused sociologists to turn away from using any explicit psychological focus. Wellman and Berkowitz point out that, "Structural analysis is characterized by a focus on social structure. Structural analysts reject approaches to social analysis that treat individuals as independent units and we are skeptical of analysis that see social behavior as determined by norms injected into the psyches of people and organizations" (1988, p. i).
Structural analysis began to use graph theory to describe linkages among the members of social systems. They also used matrices, which made it possible to analyze complex structures such as cliques, central members, and indirect linkages. On the other side the development of computers made it easier to process larger arrays of data. By the use of advanced computers, structural network analysts could study several hundred members of a population.

Some researchers have studied the links of an individual through strong and weak ties, and situate them in larger social systems. These egocentric network structures have demonstrated the continued abundance and vitality of primary relations in social systems that have been transformed by urbanization, industrialization, bureaucratization, capitalism, and technology.

Many structural analyses developed ethnographic and quantitative approaches to study social networks. These studies were developed as a critique of psychological 'relative deprivation' and to explain political behavior in terms of the personal attributes and internalized norms of individual. On the other hand, some structuralists developed ‘resource mobilization’ analyses to explain political behavior. These studies focus on links between interest groups and coalitions, competitive relations, and how direct and/or indirect ties differentially link individuals and groups to resources.
The following basic assumptions of structural social network analysis distinguish this approach clearly from sociometry and other network perspectives:

1) Structured social rules are a more powerful source of sociological explanation than personal attributes of system members.

Berkowitz and Bellman (1988) criticize other perspectives on social networks as treating social structure and process as the sum of individual actors' personal attributions, where individuals are considered to be an independent unit. They also criticized the view that collective social behavior is the result of peoples' possession of common attributes, rather than being the result of social relations. Coleman (1958) makes a similar criticism of individualist approaches: "... their methodological individualism leads them to neglect social structure and the relation among individuals" (p. 28). For structural analysis people are located, in networks, categories, classes, and strata. Thus, "Categorical memberships reflect underlying structural relationships which are patterned differences in the kinds of resources with which they are linked" (Coleman 1958, p. 33).

2) Norms emerge from location in structured systems of social relationships.

According to structural analysts, sociologists should explain behavior by analyzing the social distribution of possibilities, the unequal availability of
resources, and the structures through which people may gain access to resources, rather than explaining relationships as shared consciousness, commitments, and values. They prefer to leave individual motives to psychologists.

3) Social structures determine the operation of dyadic relationships.

Some sociologists treat dyadic interaction as the basic relational unit of analysis and they look at factors affecting the initiation, continuation, and loss of ties. They see dyadic relations as exchange relations. According to structural network analysts, structural form must be taken into account to analyze ties together with other ties in the network rather than analyzing ties in structural isolation. This was also a critique of sociometry's small group perspective. "Structural analysis interprets all dyadic relations in the light of the two individuals' additional relations with other network members" (Berkowitz and Bellman 1988, p.96).

4) The social world is composed of networks, not groups. Structural analysts avoid boundaries and aggregations. Rather they consider groups as bounded networks that are situated in a larger complex social structure. By assuming the social world is a structure of networks, structural analysts try to find complex hierarchies of power.

5) Structural methods supplant individualistic methods. Structural analysts try to develop a method for analyzing networks of relationships
among social system members because networks are linked to each other. This global perspective, linking networks specifically to the larger social environment was often absent in sociometry.

Structural network analysts also offered some other analytical assumptions that are as follows: First, "Ties are usually asymmetrically reciprocal, differing in content and intensity" (Wellman, p.40-47). There is rarely a structured one-to-one equivalence in what two persons give to each other. Second, the network links members indirectly as well as directly. Hence, linkages must be defined within the context of a larger network structure. Members of the network are engaged in a wide variety of direct and indirect ties as they search for resources. There can also be complex, cross-cutting sets of role relationships. Third, the structuring of social ties creates non-random networks, hence, clusters, boundaries, and cross-linkages. Fourth, cross-linkages connect clusters as well as individuals. Fifth, asymmetric ties and complex networks differentially distribute scarce resources. Lastly, networks structure collaborative and competitive activities to secure scarce resources.

3.4.2. SOCIAL NETWORK MODELS

Network models are used to describe the structure in which there are one or more networks of relations within a group of actors. These structural
relations are shown by matrices. According to Burt (1992), network models are a connection between micro and macro level social theory and an epistemic link between abstract concepts and empirical research. Network models offer a framework for describing social differentiation with relational patterns among actors in a system.

Using network models, sociologists can estimate the extent to which socioeconomic status, race, ethnicity, sex, age, or any other social characteristics influence the associations and oppositions in a set of social relations. Burt (1982) describes two types of criteria for social networks. These are: morphological or structural criteria that include anchorage, density, reachability, range and shape of the individual's network; and interactional criteria that include content, directedness, durability, intensity, and frequency.

3.4.3. TYPES OF DATA USED IN SOCIAL NETWORK ANALYSIS

According to Scott (1991), characteristics of social science data are rooted in cultural values and symbols. Unlike physical data of the natural science, social science data are composed of meanings, motives, definitions, and typifications. Thus, production of social science data involves interpretation. On the basis of this interpretation, social scientists have formulated distinct types of data and methods of analysis. Scott classifies
three principal types of data: attribute data, ideational data, and relational data.

Attribute data relates to the attitudes, opinions and behavior of agents that are regarded as the properties, qualities or characteristics that belong to agents, either individual or group. For example, the items collected through surveys and interviews are regarded as the attributes of individuals. Variable analysis is the most appropriate method for attribute data. In variable analysis, attributes are measured as values of particular variables such as income, education, sex, occupation, etc. The second type of data is ideational data that describes the meanings, motives, definitions and typifications themselves. Typological analysis is the most appropriate method for this kind of data. The third type of data is relational data: contacts, ties and connections as well as group attachments and meetings. They relate one agent to another and so cannot be reduced to the properties of the individual agent. Therefore, relations refer not to the agents themselves but to the system of agents. Network analysis is the most appropriate method for relational data where the relations are considered as expressing linkages that run between agents. According to Scott, social network analysis is useful for investigating, among other things kinship patterns, community structure, and interlocking directorships.
3.5 SUMMARY

This chapter explored the relations between sociometry and other theories and approaches in social psychology. The first topic for discussion was the crisis in small group studies and the development of different perspectives in social psychology. Then, specific theories—graph theory, balance theory, and social network theory—were discussed in relation to sociometry. The last part of the chapter dealt with social network analysis at length, comparing and contrasting the assumptions and methods of this approach with those of sociometry.
CHAPTER 4

A SURVEY OF SOCIOMETRY ARTICLES, 1952-1989

4.1. INTRODUCTION

Chapter 2 focused on the development of sociometry and its methods. In Chapter 3, I pointed out sociometry's relation to other methods and fields such as social networks. This chapter presents a survey of sociometry and social network 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.

4.2. 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, I collected the following information: publication year, journal title, author's name, and institutional affiliation when available. For social network articles, I recorded publication year and journal title.

4.3. ANALYSIS AND RESULTS

4.3.1. INSTITUTIONS

First, we will consider the results of the survey of sociometric articles. From the data collected it is possible to infer which academic institutions were most involved in the growth of sociological sociometry after 1952. Table 4.1 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, did
publication of sociometric articles continue into the 1980s. The average span
during which these institutions had faculty involved in publishing sociometric
articles was 15 years.

Table 4.1: Leading Institutions at which Faculty Published Sociometry

<table>
<thead>
<tr>
<th>Institutions</th>
<th>No. of Articles</th>
<th>Span of years</th>
</tr>
</thead>
<tbody>
<tr>
<td>U. Illinois-Chicago</td>
<td>17</td>
<td>1952-1984</td>
</tr>
<tr>
<td>U. Wisconsin-Madison</td>
<td>10</td>
<td>1957-1979</td>
</tr>
<tr>
<td>Harvard U.</td>
<td>9</td>
<td>1959-1968</td>
</tr>
<tr>
<td>Cornell U.</td>
<td>8</td>
<td>1960-1968</td>
</tr>
<tr>
<td>New York U.</td>
<td>7</td>
<td>1952-1964</td>
</tr>
</tbody>
</table>

Top 10 %, 7 institutions 70 articles

* Total number of institutions = 68.
** Total number of articles = 179.

4.3.2. AUTHORS

We can also look at the most published authors of sociometric articles.

From Table 4.2 we see 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.
Table 4.2: Frequency of Authors Publishing Sociometry Articles by Number of Articles, 1952-1989.

<table>
<thead>
<tr>
<th>No. of Articles</th>
<th>No. of Authors</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>383</td>
<td>86.7</td>
</tr>
<tr>
<td>2</td>
<td>45</td>
<td>10.2</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>1.8</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>.2</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>.5</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>.5</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>.2</td>
</tr>
<tr>
<td>Total</td>
<td>442</td>
<td>100.1</td>
</tr>
</tbody>
</table>

From Table 4.2 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 who published three of more articles. Table 4.3 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.

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 were Holland and Leinhardt, who published collaboratively during the 1970s. None of the leaders published after 1977.

Table 4.3: List of Authors who Published Three or More Articles Between 1952-1989.

<table>
<thead>
<tr>
<th>Author*</th>
<th>No. of** articles</th>
<th>Span of years</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Bjerstedt, A.</td>
<td>7</td>
<td>1955-1963</td>
</tr>
<tr>
<td>2- Moreno, J. L.</td>
<td>6</td>
<td>1952-1964</td>
</tr>
<tr>
<td>3- Nehnevajsa, J.</td>
<td>6</td>
<td>1955-1968</td>
</tr>
<tr>
<td>4- Holland, P. W.</td>
<td>5</td>
<td>1970-1977</td>
</tr>
<tr>
<td>5- Leinhardt, S.</td>
<td>5</td>
<td>1970-1977</td>
</tr>
<tr>
<td>6- White, H. C.</td>
<td>4</td>
<td>1961-1971</td>
</tr>
<tr>
<td>7- Lundeberg, G. A.</td>
<td>3</td>
<td>1952-1955</td>
</tr>
<tr>
<td>8- Zeleny, L. D.</td>
<td>3</td>
<td>1952-1955</td>
</tr>
<tr>
<td>9- Borgatta, E. F.</td>
<td>3</td>
<td>1960-1975</td>
</tr>
<tr>
<td>11- Alexander, C. N.</td>
<td>3</td>
<td>1963-1968</td>
</tr>
<tr>
<td>12- Brown, J. S.</td>
<td>3</td>
<td>1965-1966</td>
</tr>
<tr>
<td>13- Singh, R. P. M.</td>
<td>3</td>
<td>1968-1973</td>
</tr>
<tr>
<td>14- Alba, R. D.</td>
<td>3</td>
<td>1972-1973</td>
</tr>
</tbody>
</table>

Total = 14 authors 57 articles

* Total number of authors = 442.
** Total number of articles = 387.

4.3.3. ARTICLES

Figure 4.1 shows cumulative growth of sociometric articles published between 1952 and 1989. The figure shows that the growth of the sociometric
Figure 4.1: Cumulative Growth of Sociometry Articles, 1952-1989.
literature began to level off after 1969. The growth curve is nearly horizontal in the late-1980s. Figure 4.2 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 were being published as in the early 1950s.

4.3.4. JOURNALS

Sociometric articles were found to be published in 134 different journals. Table 4.4 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 4.5 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
Figure 4.2: Publication of Sociometry Articles, 1952-1989.
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.

Table 4.4: Frequency of Journals Publishing Sociometry Articles by Number of Articles, 1952-1989.

<table>
<thead>
<tr>
<th>No. of Articles</th>
<th>No. of Journals</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>84</td>
<td>62.7</td>
</tr>
<tr>
<td>2</td>
<td>21</td>
<td>15.7</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>7.5</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>.7</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>1.5</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>3.0</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>1.5</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>.7</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>.7</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>1.5</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>.7</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>.7</td>
</tr>
<tr>
<td>17</td>
<td>2</td>
<td>1.5</td>
</tr>
<tr>
<td>27</td>
<td>1</td>
<td>.7</td>
</tr>
<tr>
<td>64</td>
<td>1</td>
<td>.7</td>
</tr>
<tr>
<td>Total</td>
<td>134</td>
<td>99.8</td>
</tr>
</tbody>
</table>

I have categorized the 134 journals 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 4.5: List of Journals Publishing the Most Sociometry Articles, 1952-1989.

<table>
<thead>
<tr>
<th>Journals*</th>
<th>No. of Articles**</th>
<th>Percent</th>
<th>Span of years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociometry</td>
<td>64</td>
<td>16.1</td>
<td>1952-1975</td>
</tr>
<tr>
<td>ASR</td>
<td>27</td>
<td>6.8</td>
<td>1952-1977</td>
</tr>
<tr>
<td>AJS</td>
<td>17</td>
<td>4.3</td>
<td>1955-1972</td>
</tr>
<tr>
<td>Human Relations (England)</td>
<td>17</td>
<td>4.3</td>
<td>1957-1974</td>
</tr>
<tr>
<td>J. of Mathematical Sociology</td>
<td>13</td>
<td>3.3</td>
<td>1966-1985</td>
</tr>
<tr>
<td>Int. J. of Sociom. &amp; Sociaty</td>
<td>11</td>
<td>2.8</td>
<td>1958-1964</td>
</tr>
<tr>
<td>Social Forces</td>
<td>11</td>
<td>2.8</td>
<td>1952-1971</td>
</tr>
<tr>
<td>J. of Group Psychotherapy,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychodrama and Sociometry</td>
<td>9</td>
<td>2.3</td>
<td>1953-1987</td>
</tr>
<tr>
<td>Total</td>
<td>169</td>
<td>42.7***</td>
<td></td>
</tr>
</tbody>
</table>

* Total number of journals = 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 Sociocy*, *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*, *Zeitschrift 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 4.3 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
Figure 4.3: Sociometry Articles
journals accounted for 22 percent and non-U.S. sociology journals for 18 percent of the articles.

Figure 4.4 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 leveling off first appeared in major U.S. sociology journals, where publication stopped after 1974. This trend was a bit 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 4.5 shows that the "other" U.S. sociology journals were the most important venue of publication 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 4.4: Cumulative Growth of Sociometry Articles by Type of Journal, 1952-1989.
Figure 4.5: Frequency of Sociometry Articles by Journal Groups, 1952-1989.
4.3.5. COMPARISON OF PUBLICATION TRENDS: SOCIAL NETWORKS VERSUS SOCIOMETRY

In Chapter 3, I stated that 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, I will compare sociometry and social network publications 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, I will compare social networks and sociometry only for the period of 1978-1989.

Figure 4.6 shows the number of sociometry and social network articles published between 1978-1989. From Figures 4.1 through 4.5 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 4.6 shows that while sociometry has been marginalized since 1978, social network articles have grown fairly steadily. By 1989, there were only one sociometric article published while publications dealing with social networks had grown to 77 articles.

4.4. SUMMARY

The aim of this chapter was both descriptive and analytic. The findings describe and analyze four areas: academic institutions which were most involved in the development of sociometry, journals which published sociometric articles, authors who wrote articles on 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
Figure 4.6: Social Network and Sociometry Articles, 1978-89.
institutions, all located in the Midwest and Northeast of the United States. These institutions were centers of sociometric research in the 1950s through the early 1960s. After the 1970s these major research universities were not centers of sociometric research anymore with the exception of the University of Illinois-Chicago where the last sociometric article was published in 1984.

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 (non-sociology) 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 I did not have enough data to support this hypothesis, some 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, not surprisingly, 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.

When we compared the publication of sociometry and social network articles for the years of 1978-1989, we saw 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 gap
between sociometry and social networks articles had grown enormously. 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.
CHAPTER 5
SOCIOLOGISTS INTERPRET
THE DECLINE OF SOCIOMETRY

5.1. INTRODUCTION

In the previous chapter, I used a count of articles published between 1952 and 1989 to show the rise and decline of sociologists' use of sociometric analysis. In this chapter, I present complementary data from a survey of sociologists who have published in sociometry.

5.2. DATA COLLECTION

5.2.1. SAMPLE

The sample for this study was professors who published articles about sociometry in the U.S. A mailed-questionnaire was sent to a sample of sixty-five professors, who had published a sociometric journal article. Questionnaires were posted on February 18, 1997. (The cover letter and
questionnaire are included in the Appendix A.) Twenty-six professors responded to the questionnaire, a forty percent return rate. Twenty-two of them completed the questionnaire. Four of them did not complete the questionnaire instead they chose to respond with a letter. There were also some comments made on the questionnaire items.

5.2.2. INSTRUMENT

The “Sociometry Survey” (See Appendix A) is a researcher-developed mail-questionnaire designed to collect information on professors' ideas about the decline of sociometry within sociology. The questionnaire consisted of fourteen questions which were both open-ended and closed-ended questions. Space was provided for comments on the closed-ended questions.

5.2.3. LIMITATIONS

The primary limitations of this survey were:

1) The instrument used to collect data was developed by the researcher and, except for a review by the thesis committee, has not been pretested a primarily used. In hindsight, some questions were found to be less useful than others.
2) The population was very limited because most of the sociometrists are retired or are no longer alive. There were not many sociometrists to be included in the survey because sociometry is no longer popular in sociology.

3) Because of the small sample size and low response rate (40 percent) only descriptive statistics are applied to the data. Additionally, results from frequency distributions on such a small, possibly-skewed, sample may not reflect characteristics of the whole population. Nevertheless, these researchers were most active during the years when sociometry's was in decline and are therefore likely to be knowledgeable about the reasons for that decline.

5.3. ANALYSIS AND RESULTS

I will discuss the results of the ”Sociometry Questionnaire” in the order that the questions were posed in the survey. Besides the statistical results, I will also discuss the respondents’ comments on the items in the questionnaire. In the case of respondents who chose to answer by letter rather than by the questionnaire, their comments are inserted into the discussion where appropriate.

The first question aimed to find out the stage of the respondents' career at which they became interested in sociometry together with the year. The data, in Table 5.1, showed that 77.3 percent of the respondents became
interested in sociometry during their graduate studies, either the Master’s or Ph.D. We also see from Table 5.2 that about half of the respondents (47.6 percent) became interested in sociometry during the second half of the 1960s. An additional 14.3 percent of them become interested in sociometry in the first half of the 1970s and 9.5 percent in the second half of the 1970s. It was not surprising that only about 20 percent of the respondents became interested in sociometry before 1960 because most of the researchers who began their career before the 1960s either have retired or are no longer living. Despite this fact, results showed that most of the respondents began to be interested in sociometry when sociometry was in its heyday, in the second half of the 1960s.

Table 5.1: Stages in which Respondents First Became Interested in Sociometry.

<table>
<thead>
<tr>
<th>Initial Interest in Sociometry</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cum. Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>3</td>
<td>13.6</td>
<td>13.6</td>
</tr>
<tr>
<td>Master’s</td>
<td>8</td>
<td>36.4</td>
<td>50.0</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>9</td>
<td>40.9</td>
<td>90.9</td>
</tr>
<tr>
<td>Post doctorate</td>
<td>2</td>
<td>9.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
Table 5.2: Year Respondents First Became Interested in Sociometry.

<table>
<thead>
<tr>
<th>Year</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cum. Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1946-60</td>
<td>4</td>
<td>19.1</td>
<td>19.1</td>
</tr>
<tr>
<td>1960-65</td>
<td>2</td>
<td>9.5</td>
<td>28.6</td>
</tr>
<tr>
<td>1966-70</td>
<td>10</td>
<td>47.6</td>
<td>76.2</td>
</tr>
<tr>
<td>1971-75</td>
<td>3</td>
<td>14.3</td>
<td>90.5</td>
</tr>
<tr>
<td>1976-80</td>
<td>2</td>
<td>9.5</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Total: 21 100
Median: 1968

The second question was about the institution where the respondents were when they began their interest in sociometry. Table 5.3 shows the results of this question. Most of the respondents became interested in sociometry at the following universities: University of Chicago, University of Michigan, Michigan State University, University of Wisconsin-Madison, and Syracuse University. The University of Michigan-Ann Arbor and University of Wisconsin-Madison were leading universities in sociometric research as shown by the sociometric articles survey in Chapter 4. The University of Chicago and Michigan State University were also two of the important centers of the sociometry research, although they were not in top 10% of the institutions discussed in Chapter 4.
Table 5.3: Institutions at which the Respondents First Became Interested in Sociometry.

<table>
<thead>
<tr>
<th>Institutions</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>U. of Chicago</td>
<td>5</td>
<td>22.7</td>
</tr>
<tr>
<td>U. of Michigan-Ann Arbor</td>
<td>5</td>
<td>22.7</td>
</tr>
<tr>
<td>Michigan St. U.</td>
<td>4</td>
<td>18.2</td>
</tr>
<tr>
<td>U. of Wisconsin-Madison</td>
<td>3</td>
<td>10.6</td>
</tr>
<tr>
<td>Syracuse U.</td>
<td>2</td>
<td>9.1</td>
</tr>
<tr>
<td>U. Of Iowa</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>Fudhara U.</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>Penn. St. U.</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21</strong></td>
<td><strong>99.8</strong></td>
</tr>
</tbody>
</table>

Question four dealt with respondents’ publication of books, journal articles, and book chapters. This question also included the name of the journals in which they published their sociometric articles. The data showed that five respondents have published a total 8 books. One author published 3, another 2, and the other three respondents each published one book. Eight respondents published a total of 19 book chapters. One of them published 9, one published 1, four respondents published 2, and two respondents each published 2 book chapters. Figure 5.4 shows the number of articles published by respondents.

Table 5.4 shows the most frequently used journals by respondents to publish their sociometric articles. From the table we see that Sociometry, Social Psychology Quarterly (formerly Sociometry) and Journal of Social...
Psychology and Sociometry were the journals most frequently used by respondents. In Chapter 4, we have already seen that the most used journals for the sociometric articles were Sociometry, American Sociological Review, and American Journal of Sociology. Figure 4.3 in Chapter 4 also showed that about 22 percent of the articles were published in sociometry journals. In Table 5.4 we see that 55 percent of the journals in which respondents published their sociometric articles are sociometry journals if we consider Social Psychology Quarterly a sociometry journal. In Chapter 4, nonsociometry journals were about 78 percent.

Table 5.4: List of Most Frequently Used Journals by Respondents for their Sociometry Articles.

<table>
<thead>
<tr>
<th>Journal</th>
<th>Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociometry</td>
<td>11</td>
</tr>
<tr>
<td>Social Psychology Quarterly</td>
<td>10</td>
</tr>
<tr>
<td>J. of Social Psy. &amp; Sociometry</td>
<td>4</td>
</tr>
<tr>
<td>Others</td>
<td>21</td>
</tr>
</tbody>
</table>

From Table 5.5 we see that about 43 percent of the respondents published one or two articles, about 23 percent of the respondents published three or four articles, 19 percent of the respondents published between five and nine articles, and about 14 percent of respondents published ten or more articles. In general, we see that nearly 60 percent of the respondents in the survey published more than three sociometric articles. As a result of the
articles survey in Chapter 4 the number was about 3 percent for the sample who published three or more sociometric articles.

Table 5.5: Frequency of Respondents Publishing Sociometry Articles by Number of Articles.

<table>
<thead>
<tr>
<th>No. of articles</th>
<th>No. of respondents</th>
<th>Percent of respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>9</td>
<td>42.8</td>
</tr>
<tr>
<td>3-4</td>
<td>5</td>
<td>23.8</td>
</tr>
<tr>
<td>5-9</td>
<td>4</td>
<td>19.0</td>
</tr>
<tr>
<td>10 +</td>
<td>3</td>
<td>14.3</td>
</tr>
<tr>
<td>Total:</td>
<td>21</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 5.6 and Table 5.7 list the respondents' first and last publication years of sociometric articles, respectively. From Table 5.6 we see that about one-third of initial publication occurred before 1970, when sociometry was at its zenith. About 40 percent of the respondents began to publish in the first half of the 1970s, when sociometry had begun to decline. The rest of the respondents, about 20 percent, first began to publish in the second half of the 1970s, when the decline of sociometry had accelerated. None of the respondents began publishing after 1979. This means that most of the respondents in the sample began to publish when sociometry was still relatively popular.
Table 5.6: List of Respondents’ First Publishing Year of a Sociometry Article.

<table>
<thead>
<tr>
<th>Year</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cum. Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1946</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>1961</td>
<td>1</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>1964</td>
<td>1</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>1965</td>
<td>1</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>1967</td>
<td>1</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>1968</td>
<td>1</td>
<td>5</td>
<td>30</td>
</tr>
<tr>
<td>1969</td>
<td>1</td>
<td>5</td>
<td>35</td>
</tr>
<tr>
<td>1971</td>
<td>2</td>
<td>10</td>
<td>45</td>
</tr>
<tr>
<td>1972</td>
<td>4</td>
<td>20</td>
<td>65</td>
</tr>
<tr>
<td>1973</td>
<td>1</td>
<td>5</td>
<td>70</td>
</tr>
<tr>
<td>1975</td>
<td>1</td>
<td>5</td>
<td>75</td>
</tr>
<tr>
<td>1976</td>
<td>2</td>
<td>10</td>
<td>85</td>
</tr>
<tr>
<td>1978</td>
<td>1</td>
<td>5</td>
<td>90</td>
</tr>
<tr>
<td>1979</td>
<td>2</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Median: 1972

In the Table 5.7 we see that more than half of the respondents stopped publishing sociometric articles before the 1980s. About one-third of the respondents continued publishing sociometric articles in the 1980s. Only three respondents (14.3 percent) last published a sociometric article in the 1990s.

Question 11 in the questionnaire asked whether respondents were still interested in sociometry. Nine of the respondents (40.9 percent) said that
they were still interested in sociometry and thirteen of them (59.1 percent) are not interested in sociometry anymore. Some of the respondents who were still interested in sociometry found sociometry a useful way to study human agency. One of the respondents said that there were important theoretical and applied issues to be resolved, therefore s/he would continue using sociometry. Another respondent found sociometry important to study the natural pattern of social structures and networks. Respondents who were not interested in sociometry anymore mostly said that sociometry was not used anymore. The main reasons derived from the respondents' comments are that sociometry was too limiting and it has been replaced and superseded by more sophisticated network theory and analysis. Most of the respondents who were not interested in sociometry anymore had moved on to other research interests. One of the respondents said that s/he had moved into another field because of his/her job depends upon obtaining grant money. This comment may reflect that there is no longer much grant money available for sociometric research.

On this point let us turn to the issue of funding research. The results of the survey showed that eleven of the respondents (52.4 percent) received financial support in their sociometric research, and ten of them (47.6 percent) did not. From the Table 5.8 we see that the main funding sources for sociometric research were universities (30.8 percent), non-profit
organizations (23.1 percent), and the government (non-military) (19.2 percent).

Table 5.7: List of Respondents' Last Publishing Year of a Sociometry Article.

<table>
<thead>
<tr>
<th>Years</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cum. Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 1969</td>
<td>1</td>
<td>4.7</td>
<td>4.7</td>
</tr>
<tr>
<td>1970-79</td>
<td>10</td>
<td>47.7</td>
<td>52.4</td>
</tr>
<tr>
<td>1980-89</td>
<td>7</td>
<td>33.3</td>
<td>85.7</td>
</tr>
<tr>
<td>1990s</td>
<td>3</td>
<td>14.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td></td>
<td>100.0</td>
</tr>
</tbody>
</table>

Median: 1981

Table 5.8: List of Funding Sources Used by Respondents on Their Sociometric Research*.

<table>
<thead>
<tr>
<th>Resource</th>
<th>Freq.</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>University</td>
<td>8</td>
<td>30.8</td>
</tr>
<tr>
<td>Non profit foundations</td>
<td>6</td>
<td>23.1</td>
</tr>
<tr>
<td>Government (non-military)</td>
<td>5</td>
<td>19.2</td>
</tr>
<tr>
<td>Private non profit organizations</td>
<td>4</td>
<td>15.4</td>
</tr>
<tr>
<td>Military</td>
<td>2</td>
<td>7.7</td>
</tr>
<tr>
<td>Private profit organizations</td>
<td>1</td>
<td>3.8</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>100.0</td>
</tr>
</tbody>
</table>

* 11 respondents received funding for their sociometric research.

Table 5.9 shows the list of available funding sources for sociometric research. It is interesting that ten respondents who did not know of any
funding that is currently available are the same as those who did not receive any funding for their sociometric research. Thus, about 28 percent of the respondents do not know of any funding that is currently available. This was the most frequent answer. The rest of the responses about available funding sources for sociometric research are nearly the same as in Table 5.8. This shows that in estimating currently available funding sources, respondents relied upon their previous experience with funding.

**Table 5.9: List of Available Funding Sources for Sociometric Research According to Respondents***.

<table>
<thead>
<tr>
<th>Funding resources</th>
<th>Freq.</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don't know of any funding that is currently available</td>
<td>10</td>
<td>27.8</td>
</tr>
<tr>
<td>University</td>
<td>8</td>
<td>22.2</td>
</tr>
<tr>
<td>Non profit foundations</td>
<td>6</td>
<td>16.7</td>
</tr>
<tr>
<td>Government (non-military)</td>
<td>5</td>
<td>13.9</td>
</tr>
<tr>
<td>Private non profit organizations</td>
<td>4</td>
<td>11.1</td>
</tr>
<tr>
<td>Military</td>
<td>2</td>
<td>5.6</td>
</tr>
<tr>
<td>Private profit organizations</td>
<td>1</td>
<td>2.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>36</strong></td>
<td><strong>100.1</strong></td>
</tr>
</tbody>
</table>

* Number of respondents answering this question was 21.

Table 5.10 shows the list of people who personally influenced respondents in their sociometric studies. From this table we see that the most influential four people were Cartwright, Borgatta, Coleman, and Rogers.
Table 5.10: People who Personally Influenced Respondents in their Sociometric Studies.

<table>
<thead>
<tr>
<th>Name</th>
<th>Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cartwright</td>
<td>5</td>
</tr>
<tr>
<td>Borgatta</td>
<td>3</td>
</tr>
<tr>
<td>Coleman</td>
<td>3</td>
</tr>
<tr>
<td>Rogers</td>
<td>3</td>
</tr>
<tr>
<td>Bales</td>
<td>2</td>
</tr>
<tr>
<td>Festinger</td>
<td>2</td>
</tr>
<tr>
<td>Lewin</td>
<td>2</td>
</tr>
<tr>
<td>Lippitt</td>
<td>2</td>
</tr>
<tr>
<td>Rappaport</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 5.11 lists people whose written works most influenced respondents. Not surprisingly the table shows that the most influential person was Moreno. The surprising result here was the high ranking of Cartwright on this list. In Chapter 4 Cartwright did not appear in Table 4.3, which listed authors who had published the most articles. In Table 5.11 Cartwright is the second most influential author according to respondents. Moreover, Bales, Festinger, Lewin, Lippitt, and Rappaport were not in the list (Table 4.3) as the more productive authors in sociometry. There could be several reasons for these discrepancies. First, because of the interdisciplinary status of sociometry, their articles might not have been listed in the Sociological Abstracts. Second, I could have excluded these authors when I was deciding which articles were sociological or not in the Social Science Index. Another probable reason is that some of these authors, especially Festinger, Lewin,
Lippitt, and Rappaport have published their work before the 1950s and I did not include those articles in my survey of sociometric articles in Chapter 4. The last possibility is that these authors' studies were not sociological. For instance Lewin and Festinger are well-known psychologically-oriented social psychologists.

Table 5.11: People whose Written Studies in Sociometry Most Influenced Respondents.

<table>
<thead>
<tr>
<th>Name</th>
<th>Freq.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moreno</td>
<td>7</td>
</tr>
<tr>
<td>Cartwright</td>
<td>5</td>
</tr>
<tr>
<td>Bales</td>
<td>4</td>
</tr>
<tr>
<td>Festinger</td>
<td>4</td>
</tr>
<tr>
<td>Lewin</td>
<td>3</td>
</tr>
<tr>
<td>Lippitt</td>
<td>3</td>
</tr>
<tr>
<td>Rappaport</td>
<td>3</td>
</tr>
</tbody>
</table>

Question 12 aimed to find out respondents' ideas whether there was a close relationship between sociometry and current subfields of sociology. Eight respondents (36.4 percent) saw a relationship between sociometry and social networks, and fourteen of them (63.6 percent) did not.

Those who thought sociometry had a continuing relevance for current subfields of sociology offered some comments. One comment in particular was noteworthy:

Sociometry remains as a research method for measuring egocentric networks. Network research has a central role in current
sociology. Within social psychology, sociometry as a theory was replaced in about 1960 by other approaches to small groups and interaction process including exchange theory, functionalism (now dead), expectation states theory, power-dependence theory, balance theory, and various network-power theories. The "small groups" or "group processes" part of social psychology remains quite active.

Other comments were less substantial. For example, one respondent stated that sociometry is still used in small groups as a method. Another respondent said that "All micro sociology is relevant" in connection with sociometry. One of the respondents stated:

In my view, sociometry is a broad interest of the field relating to interpersonal relations of various and wide-ranging kinds. It is a basic aspect of social psychology to my mind, not limited to friendship connections.

A last comment about this issue was that "Sociometry evolved into, or was one stream of research that merged into the 'social networks' paradigm. This has replaced sociometry, for most social researchers."

In general we saw that most of the respondents who thought sociometry had a continuing relevance for current subfields of sociology, stated that sociometry has been transported into social network analysis and/or continues to have a relationship with small group sociology.

Those who did not believe that sociometry is relevant for current sociology also made comments. One wrote, "Small group has mostly disappeared, especially lab based works. All that is left is computer-simulated exchange networks." Another respondent stated that "Sociological
sociometry has moved away from the study of small groups." Another comment was "What was there—and it was pretty thin to start with—was incorporated into various ways of analyzing social networks. Sociometry is a relic of the past." One of the respondents commented about subfields which were closely related to sociometry, "Each of these areas moved away from groups in different ways, but they all lost that focus after about 1970s."

The following comment by James W. Michales is a good summary of the career of sociometry within sociology:

When Moreno first introduced sociometry, many social psychologists liked it because it was a very efficient way to measure and depict the attraction relations within a group. But one couldn’t do much else with it. Thus, sociometry was never expected to be a major force in social psychology because it was very narrowly restricted. But it was a significant contribution, and I still occasionally see sociograms presented in research reports when the purpose is to depict attraction relations within a group. Of course, it is also still presented in most introductory social psychology textbooks.

The most important part of the questionnaire was the section which included statements about the possible reasons for the decline of sociometry. In Table 5.12 a majority of the respondents agreed with two themes. One of these themes was, “lack of comprehensive theory” on which two out of three respondents agreed that a lack of comprehensive theory was an important reason for the decline of sociometry. The second theme was "sociologically-oriented social psychologists found the focus of sociometry to be too
restrictive," about 61 percent of the respondents found this reason important for the decline of sociometry. The third most important reason according to respondents was "lack of students interested in the approach," on which 50 percent of the respondents declared their agreement. Almost 45 percent of the respondents agreed that "emergence and/or development of other perspectives in social psychology" was an important reason on decline of sociometry. One in three respondents agreed that "macro-sociological currents after 1960s" and "rise of computer assisted survey research on large populations" was an important reason for the decline of sociometry. The other statements were not found to be so important for respondents as reasons for sociometry's decline. About 28 percent found "developments of more sophisticated methods and approaches in small group studies," 22 percent found "critical and radical sociological perspectives in the U.S. sociology after 1950s," about 17 percent found "lack of financial support for sociometric research," and only about 6 percent found "loss of intellectual leader" (J. Moreno died in 1974) and "Interdisciplinary status of sociometry" (sociology, psychology, psychiatry) important reasons for the decline of sociometry. Therefore, we can say that respondents maintained three important reasons for the decline of sociometry. They were lack of comprehensive theory development, finding the focus of sociometry to be too
restrictive by the sociologically-oriented social psychologists, and lack of students interested in the approach.

There were also some other comments concerning the “decline of sociometry.” One of them came from Nan-Lin. He stated that “sociometry has not declined because we now use a different term [for it] ‘social networks’ to indicate the same phenomenon. Another comment was “The theory development that took place absorbed it.”. From these comments we see that some of the respondents think that sociometry did not decline but it is still being used by sociologists under a different name such as ‘social networks’ or it has been integrated into other theories or research methods such as balance theory, power-dependency theory, and expectation states theory.
Table 5.12: Percentage of Respondent's Answering "Important" or "Very Important" to Reasons for the Decline of Sociometry (N = 18).

<table>
<thead>
<tr>
<th>Reasons for decline of sociometry</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Lack of comprehensive theory development.</td>
<td>66.6</td>
</tr>
<tr>
<td>2- Sociologically-oriented social psychologists found the focus of sociometry to be too restrictive.</td>
<td>61.1</td>
</tr>
<tr>
<td>3- Lack of students in the approach.</td>
<td>50.0</td>
</tr>
<tr>
<td>4- Emergence and/or development of other perspectives in social psychology.</td>
<td>44.5</td>
</tr>
<tr>
<td>5- Macro-sociological currents after 1960s.</td>
<td>33.4</td>
</tr>
<tr>
<td>6- Rise of computer assisted survey research on large populations.</td>
<td>33.3</td>
</tr>
<tr>
<td>7- Developments of more sophisticated methods and approaches in small group studies.</td>
<td>27.8</td>
</tr>
<tr>
<td>8- Critical and radical sociological perspectives in U.S. sociology after 1950s.</td>
<td>22.2</td>
</tr>
<tr>
<td>9- Lack of financial support for sociometric research.</td>
<td>16.7</td>
</tr>
<tr>
<td>10- Loss of intellectual leader (J. Moreno died in 1974).</td>
<td>5.6</td>
</tr>
<tr>
<td>11- Interdisciplinary status of sociometry (sociology, psychology, and psychiatry).</td>
<td>5.6</td>
</tr>
</tbody>
</table>

5.4. SUMMARY

This chapter focused on the results of a questionnaire which was mailed to active sociologists who have published sociometric articles. The results of the survey showed that most of the respondents began to take an interest in sociometry during the 1960s when it was popular among social psychologists. Respondents tended to become interested in sociometry during their graduate training. Most of them began to study sociometry in
those universities that were found to be the most important centers for sociometric studies.

The journals most frequently used by respondents for publishing their sociometric research were sociometry journals, such as Sociometry, Social Psychology Quarterly (formerly Sociometry) and Journal of Social Psychology and Sociometry. About 40 percent of the respondents stated that they were still interested in sociometry as a research method. About 60 percent of respondents were not interested in sociometry because they found that sociometry was very restrictive and no longer popular in sociology. Lastly, about half of the respondents noted that sociometry has been replaced by the social network analysis.
CHAPTER 6

CONCLUSION

6.1. OVERVIEW

This chapter summarizes the major findings of this research, presents a broader discussion of the information gathered from the data analysis, and provides suggestions for future studies.

The data used in this study were collected from three sources. The first source, the literature review, was used in Chapter 2 and Chapter 3 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. The third source was a sociometry questionnaire which was mailed to active sociologists who published sociometric research. At this point, before discussing their implications, it will be helpful to summarize those findings.
In Chapter 2, we saw that 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. Chapter 3, examined the relationship
of sociometry with other subfields and approaches, such as gestalt theory,
group theory, balance theory, and social network analysis. In Chapter 3, we
saw that 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.

Chapter 4 reports the 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, Carneige-Mellon, Cornell, and New
York University. The data showed 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 begin 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, I categorized the 134 journals 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.

The last analysis was done on data collected from active sociologists who have published sociometric research. The data was collected using a mailed questionnaire. Chapter 5 discussed the results of this survey. These results corroborated the analysis of sociometric and social network articles. Almost 50 percent of the respondents became interested in sociometry during the 1960s when it was at its zenith while only 10 percent of respondents started to be interested after the mid-1970s. The academic institutions where respondents became interested in sociometry also showed similar trends to those shown by the article analysis results. Universities where respondents most often first became interested in sociometry were Chicago, Michigan, Michigan State, and Wisconsin.

When we look at first and last publication years of sociometric articles, one out of three respondents first published an article before the 1970s, in other words when sociometry was in its heyday. No respondent's initial publication was later than 1979. This result showed that none of the
respondents' first publications were after sociometry became marginalized. About 50 percent of the respondents had stopped publishing sociometric research before the 1980s, 33 percent in the 1980s, and about 15 percent in the 1990s. On this point, it will be helpful to look at the respondents' current interests in sociometry. The data showed that about 60 percent of the respondents are no longer interested in sociometry and have moved to another field.

The data also included information about funding for sociometric research. The main funding sources used by respondents for their sociometric research were university, non profit foundations, government, and non profit organizations. Not surprisingly, the results showed that with the exception of two respondents, they did not use military sources in their sociometric research because the majority of respondents began their career after the 1960s.

In the questionnaire, respondents were asked to identify authors whose written studies in sociometry most influenced them. Moreno, Cartwright, Bales, Festinger, Lewin, Lippitt, and Rappaport were chosen as the most influential authors.

Another issue was whether respondents found a close relationship between sociometry and current subfields of sociology. There were two main responses to this item. One group said that sociometry was not being used
anymore in sociology and it did not have any relations to current subfields of sociology. The second group found a relationship between sociology and other subfields of sociology, usually social network analysis. They thought that sociometry was replaced by social network analysis because of its more sociological viewpoint. Some respondents thought that sociometry was also related to small group studies. A small number of respondents thought that sociometry had not disappeared but remains in existence under the term “social network analysis.”

The last part of the analysis of the sociometry survey dealt with the statements about the possible reasons for the decline of sociometry. The majority of them thought that the most important reasons for the decline of sociometry were lack of comprehensive theory, the restrictive focus of sociometry, the lack of student interest in the approach, and the emergence and/or development of other perspectives in social psychology.

In the next section, we will revisit the theoretical issues that were discussed in the first chapter. Our goal will be to explain how the evidence discussed in the previous chapters and summarized in the present section addresses these issues. I will also draw upon the sociology of science literature to give a wider perspective when that is appropriate.
6.2. IMPLICATIONS

In Chapter 1, 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 4.6, 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 (p. 128).

In Chapters 3 and 4, I traced the history of these crises as they impacted small group studies and sociometry. 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
Altman 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 1970s. The data in Chapter 4 showed that the publication of sociometric articles in major U.S. journals began to decline at the end of the 1960s. 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 1960s. This change in the journal’s contents was also followed by the journal’s change of title. Detailed discussion of this issue was undertaken in Chapter 2, section 2.5.

Results of the “Sociometry Questionnaire” survey showed that the main reasons for crisis in social psychology and small group sociology and the reasons for the decline of sociometry were almost the same. The following reasons both caused a crisis in sociometric research and caused
the decline of sociometry within the sociology. According to respondents these reasons included the lack of comprehensive theory development, the restrictive focus of sociometry, the lack of student interest in sociometry, the emergence and/or development of other perspectives in social psychology, and the increasing popularity of macro-sociological approaches after the 1960s. Compared with sociometry's many liabilities, social network analysis had the advantage of using sociological, rather than psychological, assumptions and concepts. A new generation of sociologists found these advantages compelling.

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 in Chapter 3, 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.*

As noted in chapter 3, 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 behavior 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.

Thus, sociometrists were not competitive with sociologists who advocated the use of network analysis. The results of the "Sociometry Survey" showed that the emergence and/or development of other perspectives in social psychology and developments of more sophisticated methods and approaches in small group studies were believed by the
respondents to be important reasons for the decline of sociometry. The respondents' comments also suggested that sociometry was replaced by social networks because social network analysis was more sophisticated and sociological than sociometry.

Drawing on the discussion in Chapter 3, it seems reasonable to conclude that sociologists came to prefer social network analysis to sociometry, probably because it was not predicated on psychological assumptions and also because it could be used to study a wider range of social structures and not just small groups as was the case with sociometry.

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 declined, because, as explained before, the focus had changed and sociometric studies were no longer getting published in the major journals.
The survey of sociometry showed that half of the respondents believed that lack of students interested in the approach was significant for the decline of sociometry.

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

Technological advancement has a two-sided effect on the social sciences, internal and external. I will explain both factors in this section because these two factors are closely interrelated. 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 in Chapter 1, 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 behavior of individuals in a situation which may be affected by circumstances beyond the immediate context. For example, the behavior 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.¹

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

¹ For an important example of how a network approach can be integrated with macro-structural theory, see Blau (1994).
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.

6.3. SUGGESTIONS FOR THE FUTURE RESEARCH

Forces in the social structure of society as a whole (economic, political, ideological) affect the direction and content of new scientific paradigms. The need for knowledge may also drive paradigmatic change. Funding of social research is another important effect that must be taken into account. Researchers who are supported by government and private sources must choose their topics of investigation together with methods of research that are in keeping with the funding agency's programs and guidelines.

The research result presented in previous chapters tells us little about how such factors may have influenced the career of sociometry. This is an area which needs more study. As a starting point for future study I will suggest the following scenario: Between the 1940s and 1960s sociometry was strong because the military and private industry needed information about how to make teams more cooperative and efficient. For example, the military used sociometric studies to devise the best structure of troops.
Industrial organizations used sociometry to assemble the best working teams. After the restructuring of industry and the downsizing of the military in the 1970s and 1980s, and with the introduction of robotics in manufacturing and high-tech weaponry in the military, the need for sociometric studies may have been significantly curtailed.

Another issue for future research might be the effect of generational cohort on the rise and decline of sociometry. Mannheim argued that the hegemony of a system of knowledge is often the result of a generational influence. Sociometry seems to have arisen a time when social psychology was a promising interdisciplinary area of research. Moreno was trained in psychoanalysis and Freudian theory as were many other early proponents of sociometry. Psychoanalysis was of some interest to sociologists during the 1940s and 1950s. However, the generation of sociologists being trained in the late 1960s and early 1970s were probably less receptive to psychological approaches in general and were often contemptuous of psychoanalysis and Freudian theory.
APPENDIX A

SOCIOMETRY QUESTIONNAIRE
February 17, 1997

Professor Patricia D. Anderson
University of California-Los Angeles, Department of Sociology
264 Haines Hall Box 951551
Los Angeles, CA 90095-1551

Dear Professor Anderson:

The enclosed questionnaire is for my master's thesis, "The Career of Sociometry Within Sociology". The thesis is an analysis of sociometry from the sociology of science and sociology of knowledge perspectives. I am asking you to fill out the questionnaire because you have published or have research interests that are related to sociometry. An envelope is enclosed for returning the completed questionnaire to me.

This study will provide me with an important understanding of how internal and external factors have influenced sociology as a discipline. I am interested in your opinions, ideas and experiences. The information that you provide will be very helpful.

Thanks for your co-operation, time and attention.

Sincerely yours,

Sinasi Ozturk
Graduate student
Morehead State University
E-mail: sxoztu01@msuacad.morehead-st.edu
SOCIOMETRY QUESTIONNAIRE

1- At what stage in your career did you first become interested in sociometry?
   [ ] Undergraduate  [ ] Master's  [ ] Ph.D  [ ] Post doctorate  [ ] Other ______

2- At what institution did you first become interested in sociometry?

3- In a content analysis of articles published in Sociometry (1959-69), A. Paul Hare classified the following major areas of sociometric research (Sociometry 1972, p. 1-150). Which areas interested you most? Please check up to 5 areas.

   [ ] Elements of social interaction;
   [ ] Norms and social control;
   [ ] Interaction and decision process;
   [ ] Social perception;
   [ ] Social exchange and helping behavior;
   [ ] Group development;
   [ ] Roles (general description of group roles which may include the leader);
   [ ] Personality (personality characteristics and their relation to interpersonal behavior);
   [ ] Social characteristics (age, sex, social class, ethnic group, and friendship in relation to patterns of interpersonal behavior);
   [ ] Group size (including studies of the dyad, triad, and coalition formation);
   [ ] Task, e.g. Prisoner's Dilemma, two-person games which emphasize bargaining or patterns;
   [ ] Communication networks e.g. studies in the Leavitt tradition and influence of seating patterns;
   [ ] Leadership;
   [ ] Productivity: individual vs. group comparisons e.g., learning and problem solving;
   [ ] Productivity: group vs. group comparisons;
   [ ] Research methods;
   [ ] Applications of small group research e.g., in education, therapy, and business;

4- How many publications have you authored (or co-authored) dealing with sociometry?
   Books: ______  Journal Articles: ______  Book Chapters: ______

5- What are the names of journals where you published your works related to sociometry?

   ________________________________________________________________

6- What were the years of your first and last publications concerning sociometry?
   First year: _________  Last year: _________
7- Did you have financial support for your research in sociometry? [ ] Yes [ ] No
If yes, from what sources? Please mark all that apply.
[ ] private non profit organizations [ ] university
[ ] private profit organizations [ ] military
[ ] government (non-military) [ ] non profit foundations
[ ] other _______________________

8- What funding sources are available currently for sociometric research? Please mark all
that apply.
[ ] private non profit organizations [ ] university
[ ] private profit organizations [ ] military
[ ] government (non-military) [ ] non profit foundations
[ ] other _______________________

9- Name up to five people who personally influenced your studies in sociometry?
1) __________ 2) __________ 3) __________
4) __________ 5) __________

10- Name up to five people whose written studies in sociometry most influenced you?
1) __________ 2) __________ 3) __________
4) __________ 5) __________

11- Are you still interested in sociometry? [ ] Yes [ ] No
Please explain the reasons.
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

12- Do you think there is a close relationship between sociometry and current subfields
of sociology? [ ] Yes [ ] No
If yes, please Characterize this relationship:
If no, which subfield of social psychology have replaced sociometry? Please
comment on why you think this happen.
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
13- Which subfield(s) of sociology most interest(s) you currently?  

14- Please indicate the extent of importance you would assign to the following possible reasons for the 'decline of sociometry'. (If you wish you may comment on your response). VI = Very important, I = Important, S = Somewhat important, SI = Slightly important and NI = Not important

a) Lack of comprehensive theory development.
   [ ] VI [ ] I [ ] S [ ] SI [ ] NI  
   Comments: ____________________________________________________________

b) Emergence and/or development of other perspective in social psychology.
   [ ] VI [ ] I [ ] S [ ] SI [ ] NI  
   Comments: ____________________________________________________________

c) Lack of financial support for sociometric research.
   [ ] VI [ ] I [ ] S [ ] SI [ ] NI  
   Comments: ____________________________________________________________

d) Lack of students interested in approach.
   [ ] VI [ ] I [ ] S [ ] SI [ ] NI  
   Comments: ____________________________________________________________

e) Loss of intellectual leader (J. Moreno died in 1974).
   [ ] VI [ ] I [ ] S [ ] SI [ ] NI  
   Comments: ____________________________________________________________

f) Interdisciplinary status of sociometry (sociology, psychology, psychiatry).
   [ ] VI [ ] I [ ] S [ ] SI [ ] NI  
   Comments: ____________________________________________________________
g) Developments of more sophisticated methods and approaches in small group studies.
Comments: ________________________ 

h) Rise of computer assisted survey research on large populations.
Comments: ________________________ 

Comments: ________________________ 

j) Macro-sociological currents after 1960's.
Comments: ________________________ 

k) Sociologically-oriented social psychologists found focus of sociometry to be too restrictive.
Comments: ________________________ 

Return to:

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APPENDIX B

ANALYSIS AND INTERPRETATION OF THE
SOCIOGRAM AND SOCIOMATRIX

In this section, I will discuss further how sociograms and sociomatrices can be analyzed. I will start with the idea of sociometric status. Sociometric Status is the total number of choices received by one individual in the group. These choices are made on the basis of some specific criterion, such as working together, or living together. A few individuals receive a large number of choices. They are stars, while most members of the group receive a few choices. In most cases more people are under-chosen rather than over-chosen. Generally the distribution of choices is not normal in shape. That is why mostly rank-order correlation are used for sociometric tests. In general the interpretation of sociometric results is complicated issue because there are lots of factors that affect the results, such as the nature of question, the structure of group, the psychological situations of individuals, cultural values, and so on.

In addition to determining the sociometric status of the individual, there are different types of sociometric indices. Some of them are related to
the position of an individual in a group, and their main use is to compare
relative positions of individuals who are members of different groups. Others
are related to group structure, and still others are concerned with subgroups
within a larger group.

Indices relating to the position of the an individual are shown by the
following calculations. The individual’s choice status (Csi)

\[ C_{Si} : \frac{\text{Number of persons choosing } i}{N-1} \]

The rejection status of an individual:

\[ R_{Si} = \frac{\text{Number person rejecting } i}{N-1} \]

Finally, there is an index for the positive expansiveness of an individual.

\[ P_{Ei} = \frac{\text{Number of choices } i \text{ makes }}{N-1} \]

The last index is relevant when there are unlimited choices allowed. The
other indices (Csi and RSi) range from zero to +1. If it is only wanted to
compare status of an individual with another member of same group there
will be little point in dividing by N-1, because the division is the same for both
members. If it is wanted to compare the positions two individuals who are
members of different groups, then the division is necessary unless the
groups are of the same size (Branfenbrenner 1945, Northway 1967, Evans
1966).

Other indices were developed to measure the structure of the group as
a whole. Sometimes researcher wants to know the extent to which individuals
in a group choose one another. For this purpose, the index of group cohesion is used. The formula for group cohesion measure is:

\[ \text{Co} = \frac{\text{Number of mutual pairs}}{\text{Possible numbers of mutual pairs}} \]

The possible number of mutual pairs depends on the instructions for choosing given to group. In a group of \( N \) members whose number of choices is unrestricted, the possible member of mutual pairs is obtained by this formula:

\[ \frac{N (N-1)}{2} \]

If the number of choices is restricted to \( d \), this formula becomes:

\[ \frac{d (N)}{2} \]

A measure of extent to which individuals are integrated into the group is obtained by the formula for the group expansiveness:

\[ E = \frac{\text{Total number of choices made by the group}}{N} \]

These indices are used by Proctor and Loomis (1951). They relate to choices made on one criterion and are a means of comparing cohesion, integration, and expansiveness of different groups or of the same group at different times.
The indices of subgroup structure are used to measure the extent to which any sub-group prefers itself to any other group. These are related and depend on the numbers of in-group and out-group choices made. Numbers of choices are compared with the numbers that may be expected if chance and not preference determined the numbers of in-group choices.

For example, a group with $N$ members contains a subgroup of $N_1$ members. The probability that a member of group 1 will choose a person in his/her own group is shown by this formula;

$$\frac{(N_1-1)}{(N-1)}$$
REFERENCES


