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Relationships Between Podiatrists & Medical Doctors: An Examination through Network Analysis

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1991

RELATIONSHIPS BETWEEN PODIATRISTS AND MEDICAL DOCTORS:
AN EXAMINATION THROUGH NETWORK ANALYSIS

A Thesis

Presented to

the Faculty of the Department of Sociology

Western Kentucky University

Bowling Green, Kentucky

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

by

Neale R. Chumbler

July 1991

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RELATIONSHIPS BETWEEN PODIATRISTS
AND MEDICAL DOCTORS: AN EXAMINATION
THROUGH NETWORK ANALYSIS

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ACKNOWLEDGEMENTS

It has fascinated me for some time how the American health-care system is so intricately compartmentalized into specific specialties. I have an interest in the profession of podiatry. At one time medical doctors provided the care that podiatrists now do. Allopathic medicine has regarded foot-care as less important than other areas of medical care. Left as an area of its own, podiatry has nevertheless emerged as a thriving specialty.

The undertaking of this thesis is drawing to conclusion an important phase of my educational career as yet another is about to begin. As the years pass, it becomes more difficult determining who the credit and thanks go to in my educational endeavors, for my thesis in particular.

To Dr. James W. Grimm I owe a special debt, for the example that his range of knowledge constantly provides, as well as for the line-by-line attention he paid to each draft of the thesis. I am also obliged for his advice, confidence and encouragement given to me throughout this past academic year. Without his abundant assistance, this thesis would probably have not been completed.

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I feel I must also extend special words of appreciation to my parents who provided encouragement when it was needed most. And, most important, my wife Janice gave me the benefit of her wisdom, her patience, and her unrelenting encouragement. In fact, Janice read this thesis and, being courteous, stayed awake during the entire reading.

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This thesis examines how a more powerful and a less powerful profession--allopathic medicine and podiatry--are linked in a series of networks through patient referrals and practice activities. The importance of professional networks is that they link different professions such as podiatry and allopathic medicine in ways which direct attention away from ranking the power of fields or viewing them as endlessly in conflict over occupational turf (traditional research questions) to questions of the actual and regularized relationships diverse professions have with one another. This thesis analyzes professional training and activity variables related to the emergence of networks and another set of conditions that results once occupational networks become established.

Data were obtained from a mailed questionnaire survey of podiatrists who practice in the Chicago metropolitan area (N=168). Analysis consists of comparisons between podiatrists who are in networks with physicians and those who are not; and between DPM's who are in heterophilous (general referral) versus homophilous (surgical) networks with MD's. T-tests are the major form of statistical analysis used in this thesis.

The findings of this thesis support the conclusion that the educational training and podiatric practice mandates (e.g., hospital staff appointment) are important determinants of the formation of networks with MD's. Friendship and social interaction patterns between DPM's and MD's and attitudes of DPM's toward podiatry were found to be highly related to network relationships between podiatrists and medical doctors. Profiles of podiatrists' professional activities and the extensiveness of their referral communication with MD's also were found to be related to the type of network podiatrists are in with medical doctors. Overall, results of this thesis clearly show that networks do link podiatrists and physicians and that such networks have important consequences for the professional activities and orientations of DPM's.

CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

Introduction

"To him whose feet hurt, everything hurts"

Attributed to Socrates

The Need For Podiatry

Podiatry is the health science profession that is devoted to the examination, diagnosis, and treatment of the human foot (Munsey 1980; Skipper and Hughes 1983). Podiatrists (DPM's) provide 75 percent of all foot-related care in the United States (Wood 1985).

Due to trends in the American population such as the increasing proportion of the elderly and recreational trends such as the increasing number of people participating in exercise, foot problems are increasing (Greenberg 1977). In a recent survey, 10 percent of all Americans and 25 percent of all elderly Americans reported some type of foot problem (Weiner et al. 1987). However, one could safely assume that between 65 and 75 percent more Americans have foot problems, but many attempt to treat them without professional medical care (Greenberg 1977). While most Americans regularly visit the dentist twice a year, have their eyes checked regularly and submit to an annual physical examination, they neglect their feet until increasing pain nearly cripples them (Bates 1975). Because of the pervasive nature of foot problems and the

tendency for people to allow their foot problems to become acute, podiatry is both needed and useful.

As the U.S. population ages, the future need for podiatric services is expected to increase considerably (Jekel 1990; Kosinski and Stewart 1990; Skipper and Hughes 1983; Weiner et al. 1987; Wood 1985). For example, 80 percent of DPMs' patients are over 45 years of age (Settich 1990). Also, by the year 2020 the population 65 years of age and older will be almost twice the proportion of the total population that it is now and more than twice the current aggregate number (Jekel 1990). Not surprisingly, the elderly make up 45 to 50 percent of the patient population seen by DPM's (Koska 1988).

According to the Executive Director of the Illinois Podiatric Medical Association, America is approaching the "Golden Age of Podiatric Medicine" (Settich 1990). The U.S. Department of Labor projects podiatry as the seventh fastest growing profession by the year 2000 because of its high demand (Settich 1990). The "baby boomers" are aging, thus creating a lucrative market for DPM's. Americans who are 65 years of age and older have nearly 100 percent more discretionary money to spend than those aged 25-45 (Settich 1990). More women now are working and determining how money is spent. With more money to spend women will be less reluctant to utilize the services of a DPM. Consequently, if podiatry did not exist already, it would be invented as a new medical service profession (Settich 1990).

Currently, there is approximately one DPM for every 20,000 Americans. The American Podiatric Medical Association (APMA) asserts that there should be at least one DPM for every 23,000 people (Kilczewski 1990). Recently, there has been an increase in the number of

DPM's. In 1979, there were 7,500 active DPM's (Skipper and Hughes 1983), whereas in 1989 there were 12,000 active DPM's (Kilczewski 1990). It is projected that by the year 2000 there will be 14,500 DPM's, which is still thirty-one percent short of the functional necessity of 21,240 needed for the health-care system to operate effectively (Settich 1990).

The Role of Podiatry in Medical Care

The technology involved in foot care has changed enormously during the last forty years. The DPM of yesteryear--who was called a "corn doctor" and then later a chiropodist--was a practitioner who treated only corns, callouses and ingrown toenails (Hymes 1974). Today, DPM's are involved in complex procedures and in in-depth surgery of the foot through technological advances such as biomechanics. Even though some DPM's limit their practices to their office, many DPM's perform surgeries in hospitals. About seven out of every 10 DPM's in the United States have been granted hospital privileges, and four of these seven can perform surgery on an inpatient basis (Parrot 1981). Because of their recent entry into hospitals, DPM's increasingly have come into contact with MD's.

Throughout its history podiatry has had an important relationship with medicine. For most of this century podiatry has had a subservient relationship with medicine (Skipper and Hughes 1983). In recent years, however, medicine and podiatry have collaborated and realized that ailments to the foot can encompass and be the result of malfunctions to the entire body (Koska 1988; Skipper and Hughes 1983). Through their examination of the lower extremity DPM's can detect early symptoms of

acute diseases such as diabetes and vascular insufficiencies (Kosinski and Stewart 1990; Skipper and Hughes 1983), sexually transmitted diseases, alcoholic neuropathies, and infectious diseases (Gastwirth 1984). Contemporary DPM's provide a multifaceted and comprehensive service that includes a complete medical history, a thorough lower extremity physical, including a "vascular, neurologic, dermatologic and orthopedic examination, and radiographic and laboratory evaluations" (Kosinski and Stewart 1990).

Because of its importance in the early diagnosis of systemic disease, podiatric screening serves to define an important process of patient referral to physicians. An example of this referral process involves many elderly diabetic patients. The DPM carefully views all foot problems for diabetics as potentially dangerous (APMA 1989). Due to disease-related factors and an aging-related diminished sensation in the extremities, many elderly patients are unaware of serious problems until complications develop (Kosinski and Stewart 1990). However, when the DPM is screening the lower extremity and finds the early debilitating complications of diabetes, an immediate referral of the elderly diabetic to a medical specialist occurs. If these circulatory impairments are caught early enough by a DPM, then major debilitating occurrences such as gangrene and amputation can be avoided. Therefore, the DPM serves an important screening role for medical care subsequently delivered by a geriatric team.

DPM's also treat patients on a regular basis from certain populations that MD's choose not to treat (Skipper and Hughes 1983). As was stated earlier, the elderly make up 50 percent of the DPM's

patients, and most of the elderly are females. If an MD had a choice between trimming the toenails of an eighty-five year old female nursing home resident or surgically implant an artificial knee-cap in a patient, the MD would most likely choose the latter because of more money and prestige even though both tasks are functionally important (Skipper and Hughes 1983). Thus, there are many people who would be left untreated if it were not for a DPM, particularly the elderly and females.

Development of Problem

A key question concerning podiatry is how and why this limited health-care field thrives in relation to much less delimited and more legally powerful medical fields with which it has continuing relationships. Sociologically speaking, podiatry is a profession (Hymes 1974; Skipper and Hughes 1983) because it has been embodied, by states, licensing statuses, to have specific rights to treat the human foot (Rothman 1987: 61,78). On the other hand, podiatry should be regarded as a "weak" profession because DPM's do not have exclusive rights to the human foot (i.e., DPM's cannot amputate a foot and administer general anesthetic; only MD's have this exclusive privilege) (Rothman 1987: 78; Sella 1990; Skipper and Hughes 1983).

Medicine is considered the most fully developed profession because it is the most self-regulated health-care occupation. For instance, it is only a MD who may prescribe drugs, certify that a child has been born, and identify the cause of death (Rothman 1987: 61).

Competition and potential conflict between podiatrists and medical doctors are possible. However, the focus of this thesis is that through

professionalization specialization between DPM's and MD's, occupational conflict is transformed into new regularized relationships that involve inter-occupational solidarity resulting in self-limiting conflict.

Delineation of Thesis

This thesis focuses on the interrelationships between health-care fields that are very different, instead of an examination of their traits which in turn determine their degree of professionalization. More specifically, the goal of this thesis is to examine how a more powerful and a less powerful profession are linked in a series of networks. The importance of networks is that they link different professions in ways which direct attention away from ranking fields or viewing them as endlessly in conflict to questions of the actual relationships diverse professions have with one another.

The purpose of this thesis is to show that podiatrists are in relationships with physicians. In a recent national survey of DPM's, 98.7 percent of them made referrals to MD's (Skipper and Pippert 1984). In 1989, there were 42 million office visits to DPM's offices. Therefore, it can be inferred that a considerable number of patients physicians examine are initially seen by DPM's. The ongoing relationships between DPM's and other physicians will be the focus of this thesis. As will be seen in Chapter Two, professional networks are recurrent connections between professionals in different fields.

According to Rothman (1987: 87-89), one aspect of deprofessionalization is the encroachment of a field's power and autonomy by allied professions. In reference to the ongoing relationships between DPM's and MD's, the converse of Rothman's assertion is more appropriate. Historically, for the most part, medicine

has not felt threatened by podiatry's pervasive existence and as this thesis will show there continue to be important and regularized relationships between DPM's and MD's.

Historically, medicine posed no legitimate opposition to podiatry (Dagnall 1976; Levrio 1987; Schuster 1974; Skipper and Hughes 1983). As it emerged and developed, podiatry treated only a small portion of the human body and used only a partial range of therapies as contrasted to two other medical occupations--osteopathy and chiropractic--that were more challenging to organized medicine (Skipper and Hughes 1983). For example, in May 1938 a member of the Illinois Medical Society made the following favorable assertion about podiatry to the Judicial Council of the American Medical Association:

Chiropody/Podiatry is not a cult as is osteopathy, chiropractic or Christian Science, which have non-scientific bases of treatment. Chiropody/Podiatry is an ancillary to medical practice in a limited field considered not important enough for the physician and therefore too often neglected, and fills a gap in the medical profession (Lerner 1974: 285).

This declaration not only recognizes podiatry as a medical specialization, but more importantly it verifies podiatry's functional importance to medicine in today's health-care delivery system (Kosinski and Stewart 1990; Lerner 1974).

Another general assumption about deprofessionalization is that specialization would accelerate the decline of homogeneity between professions (Begun and Feldman 1981; Fromson 1977; Heinz and Laumann 1983; Rothman 1987: 85-86). Concerning the interrelationships between DPM's and MD's the converse is true. As stated by Durkheim ([1893]/1964:270) increased specialization leads to interdependency between groups. Within the last twenty-five years, specializations

within podiatry--more specifically podiatric surgery--have emerged (Russell 1989). Podiatric surgeons are not only dependent upon a general DPM for referrals, but they are also interdependent with physicians as well. A podiatric surgeon needs a MD to put the patient under general anesthetic for surgery. DPM's also need to build their reputation in the hospital. The MD needs the DPM as a continued source of referrals. Many DPM's have hospital privileges which do not decrease physicians' power so much as relate to it in an interdependency which enhances the networks between the "strong" and the "weak."

The Study Population

Analysis of data obtained from a sample of Chicago Metropolitan Area DPM's was performed for this study. Chicago is an appropriate source of data on DPM's since it has one of the most respected podiatry schools (Dr. William M. Scholl's College of Podiatric Medicine), many DPM's practice there, the state of Illinois has granted DPM's rather liberal professional privileges (e.g., easier to become a member of the medical staff of a hospital), and DPMs' practice is possibly the most specialized (e.g., majority of a DPM's practice is solely limited to surgical orientation).

Organization of this Thesis

In Chapter Two of this thesis, propositions and hypotheses derived from the review of network literature are used as the basis for predictions about the precursors and consequences of professional relationships between DPM's and MD's. A main element of the review of literature are studies on social network analysis. In this thesis

network analysis will be assessed as a most appropriate way of examining the emergence of regularized professional relationships between podiatrists and medical doctors.

Chapter Three of this thesis will describe the sampling procedures and the conceptualization and operationalization of both the precursors and outcomes of networks. Chapter Four will present and discuss the results for each precursor and outcome of professional networks. Finally, Chapter Five will include conclusions and inferences from the results found in this thesis. Also, important suggestions for future research will be posited.

CHAPTER II

REVIEW OF LITERATURE

Occupational Specialization

Occupational sociologists view professions according to two models: the attribute model and the process model. The former is a structural-functional approach (Hodson and Sullivan 1990:258) that identifies attributes or traits that can be used to determine if an occupation is a profession (Pavalko 1988:19). This taxonomical approach characterizes professions as a group of occupations with a monopoly of advanced, specialized knowledge, with autonomy, with authority over clients, with a high degree of altruism, with a sense of community, with a fervent commitment (i.e., life-long commitment of a Catholic priest), and with a code of ethics that is a part of a professional association (Cogan 1955; Goode 1957; Hodson and Sullivan 1990:258-284; Hughes 1958:2; Pavalko 1988:19-29; Rothman 1987:60-82; Wilensky 1964). If an occupation has these attributes, then it is considered a profession in comparison to occupations that do not have such characteristics.

The process model of professions claims that the characteristics found in the attribute model are more the result of professional power than its cause (Hodson and Sullivan 1990: 283). Representing the process view Pavalko (1988:32-33) contends that professional power creates a situation of a monopoly and professionals use power to manipulate their clients. According to the process model, professionalization is a

"general process by which occupational groups seek to improve their collective status by resembling a profession (Hodson and Sullivan 1990:284)." The process view of professions views them (or components of them) as engaged in political processes that attempt to consolidate monopolies over areas of occupational territory. Such conflicts may involve conflict between segments within a single profession or conflict between a field and related occupations.

The focus of this thesis represents a shift of concern from both the attribute and process model of professions in a study of podiatry. Following Durkheim (1893/1964:270), the viewpoint in this thesis is that professionalization specialization involves an occupational process of conflict that is self-limiting. The resolution of occupational conflict results in new regularized relationships between components of one occupation or between one field and related occupations.

Occupational sociologists view professional specialization as a continuous battling over occupational jurisdictions, work activities, methodologies, clients, recruits and public recognition (Ritzer and Walczak 1986: 68-69; Rothman 1987: 85-86). Following the approach of Ritzer and Walczak (1986) and Rothman (1987), Skipper and Hughes (1983) examined podiatry in terms of professionalization. They claim that podiatry has been unable to attain full autonomy over its anatomical area of expertise (the foot), thus preventing it from attaining full professional status and recognition. In contrast, this thesis will attempt to show that allopathic medicine needs a less specialized and powerful field like podiatry, and vice-versa. Network analysis--the theoretical framework used in this thesis--provides a means for understanding the resolution of competition by means of which

interoccupational solidarity develops between allopathic medicine and podiatry. Emile Durkheim's The Division of Labor in Society (1893/1964) will be examined as a means to clarify how inter-occupational rivalry leads to new working relationships between fields competing for occupational jurisdictions. Social network literature will be examined to extract factors that are the causes and consequences of occupational networks.

Based on a review of the social network literature, there is a category of factors related to the emergence of occupational networks and another set of conditions that should result once occupational networks become established. This thesis will attempt to identify both categories of factors in networks between podiatrists (DPM's) and MD's. In this chapter, both the network precursors and the outcome factors will be derived and used in propositions and related hypotheses will be derived from the network literature. Network precursor factors will be examined first.

The few empirical studies of professional networks that have been done have found that they are not based primarily on homophily or likeness between individual professionals but emerge on the basis of practitioners seeking others with more expertise than they possess (Galaskiewicz 1985; Granovetter 1973, 1983; Lin 1987). In the lexicon of network analysis such a relationship is called a weak tie or heterophily (weak ties will be formally defined later in this chapter). Factors related to the establishment of weak ties will be considered in this thesis as the precursors of networks that develop between DPM's and MD's.

In contrast to studies of occupational networks, research on kinship (Perrucci and Targ 1982; Radelet 1981; Wellman and Wortley 1990) and friendship (Festinger et al. 1950; Kuo and Tsai 1986; Lin et al. 1985) networks indicates that such networks develop on the basis of interpersonal likeness or homophily. Similarity of the participants is a key to the emergence of networks among kin and friends. The perspective used in this thesis is that liking and solidarity but not necessarily homophily may be a byproduct rather than a determinant of professional networks. This is because the major precursors of professional relationships are training/expertise and legal prescriptions of practice rather than personal traits of practitioners.

Network Analysis

Network analysis is an appropriate way of assessing the actual role of podiatry vis-'a-vis medicine. Network analysts search for deep structures--patterns of relations among social units, whether people, collectivities, or positions (Turner 1991: 540; Wellman 1983:156-157). From a network perspective, social organization is conceptualized as the form of ties among positions (Turner 1991:551). More specifically, "a social network is a set of direct or indirect ties among a defined group of individuals or organizations (Perrucci and Targ 1982)."

The Effects of Being in Networks

Whether people are in a particular social network or not has an effect on the way they behave and what they think (Collins 1988:416). The more involved individuals are in their network(s) the more they are positively affected by group involvement (Bott 1971; Festinger et al.

1950). For example, individuals who have a dense social support network tend to have better mental health in reacting to stressful events (Kadushin 1982; Lin et al. 1985; Perrucci and Targ 1982).

Similarly, Galaskiewicz (1985) found that the more proximate two actors were in a professional network, the more likely they were to evaluate colleagues similarly. Burt (1982) found that individuals who are active in networks have extensive ranges of contacts and are similar to those individuals. In fact, Burt (1982) attributes this similarity to a perceptual process.

Network Ties between DPM's and MD's

Ties are the interdependent connections between members of a network. Moreover, a tie is the configuration through which resources and communication flow among members in particular positions in a network (Turner 1991:540). In this thesis networks will be operationalized in terms of recurrent referral relationships between DPM's and MD's. Examples of the interdependent ties that are expected to link DPM's with medical specialists include the role of foot problems in early diagnosis of diseases such as diabetes (networks between DPM's and medical diabetic specialists), the biochemical and surgical advances in treating foot problems (referral and consultive networks between DPM's and orthopedic surgeons, especially those in hospitals), and the increase of foot-related injuries and abnormalities associated with exercise (networks between DPM's and sports medicine specialists). The viewpoint of this thesis is that social network ties applied to referral relationships explain podiatry's persistent and expanding role in the health-care delivery. Such ties are also very important in explaining

why interdependency rather than continuous rivalry exists between podiatrists and physicians.

Durkheim's Mechanical Solidarity based on Homophily

Durkheim (1893/1964:70-110) argued that mechanical solidarity is based on homogeneity or sameness. In the lexicon of network analysis this idea is the principle of homophily. At the micro level the homophily principle develops when two or more individuals with similar social characteristics--age, kinship, ethnicity--seek one another and are therefore linked subsequently in a network (Lazarsfeld and Merton 1964; Lin et al. 1985). Hence, the homophily principle is a prelude to networks that are based on strong ties. Strong ties occur when high levels of resources flow among positions (Turner 1991:553). Therefore, likeness, in Durkheim's view, limits the emergence of social differences (Durkheim 1893/1964:70-110). In the case of professions, stronger ties are expected to develop when the training/expertise and practice mandates of one field (podiatry) become increasingly similar to those of a competing field (such as allopathic medicine). The viewpoint of this thesis is that inter-professional networks emerge as occupational jurisdictions become similar. That is, professional homophily emerges through jurisdictional rather than interpersonal similarity.

Durkheim's Organic Solidarity based on Heterophily

Organic solidarity is generated by dissimilarity of occupational duties and the interdependencies created by such differences (Durkheim 1893/1964:127). Granovetter's argument (1973, 1983) for the strength of weak ties is the logical equivalent of Durkheim's organic solidarity.

Granovetter (1973, 1983) has described such unity as being based upon the strength of delimited (or weak) occupational labor markets ("duties") or community ties. Such unity describes the way information or resources is passed among members of occupational groups or throughout a community. Weak (or heterophilous) ties connect people who are not part of a person's local clique. Weak ties also connect people indirectly into more remote parts of the social structure.

Weak ties are parallel to Levi Strauss' (1948/1969) "long cycles" in the kinship systems of tribal societies. Long cycles indirectly link together many distant families. These linkages eventually transform the kinship system from dependence on localism to broader bases of organization. With more contemporary significance, Lin (1982) proposes that weak ties are important when linkages are established between people who have fewer resources and those who have more. Weak ties connect people to others with more organizational power than they themselves possess. In the case of podiatrists, weak ties link them to physicians who can help or give them information about referrals, patients, etc. (Collins 1988:427). Such ties also exist because MD's have more power over treatment of disease than DPM's do. Professional specialists are constrained by the broader reality of legal mandates and by the bounds of specialized expertise (Durkheim 1893/1964:111-132). Therefore, inter-professional networks also emerge because occupational jurisdictions remain circumscribed even with the professional homophily described above.

Precursors of Professional Networks

Demographic Traits of Podiatrists

It is possible that practitioners in professional networks may develop sentiments of collective unity. That is, liking may well be an outcome that follows from a well established professional network (Grimm and Chumbler 1991a). However, the homophily based on interpersonal similarity is not expected to be a precursor of professional networks. Instead, jurisdictional homophily is expected to precede professional networks. Therefore, friendships are expected to be outcomes of networks rather than their antecedents.

Following Durkheim (1893/1964), Galaskiewicz (1985) and Granovetter (1973, 1983) DPM's make referrals to MD's because of the greater power and resources possessed by MD's. Legal mandates that limit podiatric practice to the foot and that grant MD's more extensive treatment techniques generate referrals from DPM's to MD's. This type of network is characteristic of weak ties (or heterophily) because weak ties can link between individuals, like DPM's and MD's, even though they do not know one another personally (i.e., they are mere acquaintances) (Granovetter 1973, 1983). Such networks contrast with those based upon similarity of personal traits (i.e., strong ties). For example, if a female DPM is treating a patient and detects a peculiar abnormality she will refer the patient to a MD based upon the expertise and professional reputation of the MD rather than whether or not the MD is female. Therefore, the following proposition and related hypotheses can be advanced:

Proposition 1: The demographic background traits of DPM's or MD's-- their age, gender and race--should not be important in differentiating networks between podiatrists and physicians. That is, these traits will not be related to whether or not DPM's are in networks with MD's, nor will they be related to the types of networks podiatrists and physicians are in.

From proposition 1, the following hypotheses will be tested:

- 1.1a. The age of DPM's will not be related to whether or not DPM's are in networks with MD's.
- 1.1b. The age of podiatrists will not be related to podiatrists being in homophilous versus heterophilous networks with physicians.
- 1.2a. The gender of the DPM's will not be related to whether or not DPM's are in networks with MD's.
- 1.2b. The gender of DPM's will not be related to DPM's being in similar versus dissimilar networks with MD's.
- 1.3a. The race of podiatrists will not be related to whether or not podiatrists are in networks with MD's.
- 1.3b. The race of podiatrists will not be related to podiatrists being in homophilous versus heterophilous networks with physicians.

Podiatric Training

Strong ties among friends and family occur when individuals seek others who possess similar interpersonal characteristics (Kuo and Tsai 1986; Lin et al. 1985; Perrucci and Targ 1982). The analogous situation among professions occurs with respect to jurisdictional homophily. Podiatrists go to a four-year podiatry school and physicians go to a four-year medical school, and each school has different curricula, scopes of instruction, and missions (Russell 1989; Sella 1990). Nevertheless, hospital residencies have recently become an important part of podiatric training. Within the last 25 years post-doctoral hospital residencies--from one to three years in length--have become available for many DPM's (Black 1990; Levy 1979). The trend in podiatric

medicine therefore has been for DPM's to perform more and more surgeries in hospitals (Levrío 1987).

Due to the increasing role of hospital residencies in podiatric training more DPM's now are collaborating with MD's in hospitals and thus are becoming efficient liaisons between numerous types of MD's (Levy 1979). As a part of their expanding professional expertise more DPM's are going through hospital residencies that include the training and certification that increases jurisdictional homophily between them and MD's. The role of hospital residencies in the training and certification of DPM's is a key factor in increasing jurisdictional homophily. Therefore, the following proposition and related hypotheses can be advanced:

Proposition 2: Hospital based residency training will increase the probability that DPM's are in networks with MD's.

The following hypotheses derived from Proposition 2 will be tested:

- 2.1. DPM's who have completed an approved hospital residency will more likely be in networks with MD's than those who have not completed a hospital residency.
- 2.2. It is expected that those podiatrists who have completed an approved hospital residency are more likely to be in homophilous rather than heterophilous networks with physicians.

Podiatric Practice Mandates

Even though the first hospital foot clinic was established in 1928 and by 1953 there were 1,000 DPM's who had hospital affiliations (Holloway 1987:118), membership on a hospital medical staff is clearly part of the "modern era" of podiatric medicine (IPMA 1987:22). It was not until 1976 that the American Medical Association (AMA) and the Joint Commission on Accreditation of Hospitals (JCHA) mandated that DPM's

should not be denied hospital privileges (Rutenberg 1977). This change in legal mandate explains why nearly three in four Chicago-area DPM's, for example, have hospital privileges (Grimm and Chumbler 1991b). Podiatrists benefit from membership on the medical staff of hospitals for two reasons: (1) they need to have a hospital base for the admission of complicated cases, most often for in-patient surgery, and (2) hospital privileges allow DPM's to have access to all medical specialists and, potentially, to important sources of referrals (IPMA 1987:20).

The legal mandates that have given podiatrists hospital staff privileges have increased the opportunities for them to enter referral networks with MD's, especially those physicians that specialize in surgery. Following network analysis literature on individual mobility this is similar to White's (1970) "vacancy chains". His main argument is that people usually obtain employment positions only as such positions open. Trends in the number and types of position openings are more important than the personal characteristics of the seekers of openings. In relation to networks between podiatrists and MD's, it was the 1976 mandate that created the trend toward more hospital based positions for podiatrists. Hospital staff membership, then, is a key structural determinant of the increased possible practice relationships between DPM's and MD's.

Since most physicians' practice consists of hospital duties, those DPM's who have been granted hospital staff memberships are in a more jurisdictionally homophilous relationship with physicians. In other words, the changing legal mandates is an important factor in generating

more homophilous relationships between DPM's and MD's. Therefore, the following proposition and related hypotheses can be advanced:

Proposition 3: DPM's who are members of hospital staffs will be more likely to be in networks with MD's than podiatrists who are not on staffs.

From Proposition 3, the following hypotheses will be tested:

- 3.1. Podiatrists who have hospital staff appointments will more likely be in networks with physicians than those who do not have such hospital staff appointments.
- 3.2. It is anticipated that those DPM's who have hospital staff appointments are more likely to be in homophilous rather than heterophilous networks with MD's.

Proximity to MD's

As the network literature makes clear, the proximity between individuals is an important part of the ties that develop in all social networks. Proximity is the ease with which persons can be contacted (Perrucci and Targ 1982). The concept of proximity is analogous to Durkheim's discussion of population density and volume (Durkheim 1893/1964:257-274). The more proximate the solicited other, the easier it will be to establish and maintain a network with that other (Galaskiewicz 1985). For example, if DPM's practice close to physicians' offices, then the DPM's are more likely to have contacts with MD's and be able to make referrals to them. More specifically, podiatrists treat many elderly patients and they would rather refer them to nearby MD's in order to reduce the travel risks in making such referrals (Jekel 1990).

Following Granovetter (1973, 1983), the proximity between DPM's and MD's is a condition that is expected between podiatrists and medical doctors who are in heterophilous or weak tie networks. On the other hand, following Galaskiewicz and Shatin (1981), the proximity between

DPM's and MD's is a condition that is expected between podiatrists and physicians who are in homophilous or strong tie networks. In short, proximity to MD's will be related to all types of networks. The following proposition and related hypotheses can therefore be posited:

Proposition 4: In all types of networks between DPM's and MD's the more proximate the solicited physicians are to podiatrists-- such as whether DPM's share offices in the same building as MD's, feel that those MD's who they share offices with in the same building are accessible for referrals, and whether DPM's practice within ten blocks from an MD's office--the more likely networks will develop between podiatrists and physicians.

From Proposition 4, the following hypotheses will be tested:

- 4.1a. DPM's who share offices in the same building as MD's will more likely be in networks with MD's than those podiatrists who do not share offices with physicians.
- 4.1b. Office sharing will not be related to the type of network DPM's and MD's are in.
- 4.2a. DPM's who indicate that MD's in the same building/complex are accessible for referrals will more likely be in networks with MD's.
- 4.2b. Accessibility of referrals will not be related to the type of network podiatrists and physicians are in.
- 4.3a. Podiatrists whose practice location is within ten blocks from an MD's office will more likely be in networks with physicians than those podiatrists who practice further than ten blocks from an MD's office.
- 4.3b. Location within ten-blocks will not be related to the type of networks DPM's and MD's are in.

Density of Practice Relationships

Research on the networks between donation officers in volunteer organizations found that professionals seek out those with whom they are in close proximity, even if it means segregating themselves from other actors in their own group (Galaskiewicz 1985). Related to such findings concerning proximity, Durkheim (1893/1964:265) argued that social density is the extent to which a person is physically accessible to

others. Following Durkheim, DPM's who are more widely in proximity to MD's (i.e., practice in more than one office location) or practice in a group practice will be more available to MD's and therefore be more likely to be originators of referrals. Thus as DPM's expand their practice locations and if they practice in a group they are expected to increase the probability of networks with MD's (Lerner 1974). The following proposition and related hypotheses can therefore be advanced:

Proposition 5: The increased scope of DPM's practice locations--such as whether podiatrists are a member of a group practice or practice in more than one office location--will be related to a greater probability of networks with MD's.

From Proposition 5, the following hypotheses will be tested in this thesis.

- 5.1a. DPM's who have a group instead of a solo practice will more likely be in networks with MD's.
- 5.1b. Podiatrists who have a group instead of a solo practice will more likely be in homophilous rather than heterophilous networks with MD's.
- 5.2a. DPM's who practice in more than one office location will more likely be in networks with MD's than those DPM's who practice in only one office location.
- 5.2b. Podiatrists who practice in more than one office location will more likely be in homophilous rather than heterophilous networks with MD's.

Outcomes of Networks Between DPM's and MD's

Profile of Professional Activity

Network literature shows that the effects of being in networks influences people's attitudes and behaviors. For example, Galaskiewicz (1985) found that networks based upon the job status, the associational memberships, and the office proximity of donation officers had substantial effects on their attitudes toward and amount of philanthropic giving. Knoke (1990) found that the more frequently people

discuss political matters with their intimates, the greater their interest and participation in national campaigns and voting. Research by Kuo and Tsai (1986) showed that Asian immigrants greatly reduced their psychological distress and the detrimental effects of migration if they had re-established a social network in the American society. People in networks with positive social-emotional bonds are more inclined to respond to initial deviance by defining it in medical or psychiatric terms and to urge the deviant to seek a medical professional (Perrucci and Targ 1982). Moreover, family networks exert significant influences on the decision of mentally ill patients to seek psychiatric assistance (Horwitz 1977) and their use of both prescribed and nonprescribed medications (Osterweis et al. 1979).

Following from the network literature, DPM's are expected to be effected by their participation in networks with MD's. That is, the professional activities of DPM's are expected to be related to the types of networks they are in with MD's. More specifically, podiatrists who are in networks with physicians will be more likely to engage in practice activities that are similar to those of MD's. Such activities should include seeking certification by the American Board of Podiatric Surgery, increased involvement in surgical procedures, increased amounts of practice time in hospitals and increased referrals from hospitals. Recent research on podiatric practice profiles indicates that involvement in hospital related practice activity and surgical activity are the keystones of contemporary podiatric medicine (Holloway 1987; Levy 1979; Settich 1990). Network literature and evidence on contemporary podiatric practice support the following proposition:

Proposition 6: DPM's who are in networks with MD's will be more likely to practice in ways that are similar to those of MD's.

Based upon Proposition 6, the following hypotheses will be tested:

- 6.1a. DPM's who are in networks with MD's are more likely to be certified by the American Board of Podiatric Surgery than those who are not in networks with MD's.
- 6.1b. DPM's who are in more homophilous networks with MD's will be more likely to be certified by the American Board of Podiatric Surgery than those who are in heterophilous networks with MD's.
- 6.2a. DPM's who are in networks with MD's are more likely to consider expanding the surgical orientations of their practice within the next three years than those who are not in networks with MD's.
- 6.2b. Podiatrists who are in more homophilous networks with MD's will be more likely to expand the surgical orientations of their practice within the next three years than those who are in heterophilous networks with physicians.
- 6.3a. Podiatrists who are in networks with physicians are more likely to spend more hours per week in hospital practice than those who are not in networks with physicians.
- 6.3b. Podiatrists who are in more homophilous networks with MD's will be more likely to spend more hours per week in hospital practice than those who are in heterophilous networks with physicians.
- 6.4a. DPM's who are in networks with MD's are more likely to receive an increased amount of patient referrals from hospitals than those who are not in networks with MD's.
- 6.4b. DPM's who are in more homophilous networks with MD's will be more likely to receive an increased amount of patient referrals from hospitals than those who are in heterophilous networks with MD's.

Extent of Referral Communication

Lin et al. (1985) contend that networks based on strong ties involve more intense and more frequent communication. In this study we expected that such intense communication develops among DPM's and MD's who are in homophilous networks. For example, as a result of being in such networks, surgically oriented podiatrists and orthopedic surgeons are expected to collaborate more extensively. Therefore, it is expected

that DPM's in such networks will report more extensive and direct communication with MD's.

Perrucci and Targ (1982) contend that strong tie networks between professionals contain more identifiable decision-making and a higher degree of interdependent communication that leads to collectively based action. In this study it is expected that podiatrists in homophilous networks with physicians will be more likely to report exchanging personal letters about patients, to consult face-to-face over possible surgical techniques and collaborate on surgical techniques, all of which are considered to be more extensive modes of communication.

Durkheim argued convincingly for the idea that limits of duties structures the communication and solidarity between occupations (Durkheim 1893/1964:233-255). The relationships that accompany the division of labor rest on the legal constraints that limit unending conflict between specialists. Network literature suggests that the communication patterns by which political information flows through larger communities involves weak ties (Granovetter 1973). Research on diffusion of ideas in occupations suggest that communication of basic information is also based on weak ties (Knoke 1990). It is therefore expected that communication between DPM's and MD's in heterophilous networks will be less extensive and more formal.

Based upon the network literature the following proposition about communication between podiatrists and physicians can be posited:

Proposition 7: The more involved DPM's and MD's are in networks the more extensive the communication.

From the proposition the following hypotheses will be tested:

- 7.1a. DPM's in networks with MD's are more likely to exchange information about surgical techniques than those who are not in networks with MD's.
- 7.1b. Podiatrists who are in more homophilous networks with physicians will be more likely to exchange information on surgical techniques than those who are in heterophilous networks with physicians.
- 7.2a. Podiatrists in networks with physicians are more likely to exchange personal letters about patients than those who are not in networks with physicians.
- 7.2b. DPM's who are in more homophilous networks with MD's will be more likely to exchange personal letters about patients than those who are in heterophilous networks with MD's.
- 7.3a. DPM's in networks with MD's are more likely to engage in face-to-face consulting than those who are not in networks with physicians.
- 7.3b. Podiatrists who are in more homophilous networks with physicians will be more likely to engage in face-to-face consulting about possible treatments/techniques on patients than those who are in heterophilous networks with MD's.

Extent of Friendship

Friendship is socially patterned in networks (Perrucci and Targ 1982; Radelet 1981; Wellman and Wortley 1990). More specifically, there is a tendency for friendship to develop as a direct result of people associating together with others in the performance of occupational duties (Laumman 1966, 1973; Fischer 1982). Wellman and Wortley (1990) showed that community ties with friends are a principal means by which people and households get supportive resources. Furthermore, they conclude that friends make up about half of all supportive relationships. In the context of this study it is expected that friendships have a greater probability of developing between podiatrists and MD's who are in networks. In addition, DPM's who are in more homophilous networks with MD's are expected to have closer friendships with MD's than those DPM's who are not in such networks.

Friendships that develop from networks between DPM's and MD's are expected to extend to social interaction outside the office. On the basis of expectations about networks between DPM's and MD's leading to friendships and social interaction outside the office, the following proposition and related hypotheses can be stated:

Proposition 8: The more involved DPM's and MD's are in networks the more likely DPM's are to consider MD's friends and the more likely podiatrists are to interact socially with physicians.

Based upon Proposition 8, the following hypotheses will be tested:

- 8.1a. DPM's who are in networks with MD's are more likely to consider MD's as friends than those podiatrists who are not in networks with MD's.
- 8.1b. DPM's who are in more homophilous networks with MD's are more likely to be friends with MD's than those who are in heterophilous networks with MD's.
- 8.2a. Podiatrists who are in networks with physicians are more likely to interact with physicians outside of the office at least two or more times a month than DPM's who are not in networks with MD's.
- 8.2b. Podiatrists who are in more homophilous networks with physicians will be more likely to see MD's outside of the office at least two or more times a month than those who are in heterophilous networks with physicians.

Attitudes Toward Podiatry:

Galaskiewicz (1985) found that the more professional similarity between actors in a network, the better friends the actors were and the more similar their orientations toward professional activity. In addition, such professionals were more likely to evaluate themselves similarly. Based on such research, professionals who are in networks with those in other occupations should have orientations similar to those of these outsiders.

Burt (1982) attributes this orientational similarity of persons who are in related professional positions to the emergence of human

perceptions. Such orientational similarity can be expressed as follows: DPM's who are in networks with MD's will be more likely to have professional orientations that are similar to those of MD's. It is expected that podiatrists in networks with physicians will rate podiatry higher in economic reward, legal authority, prestige or status and psychological reward than those DPM's who are not in networks with MD's. It is also anticipated that podiatrists in homophilous networks with MD's will rate podiatry higher on the orientation criteria than will DPM's in heterophilous networks with medical doctors. As a proposition these expectations can be stated as follows:

Proposition 9: DPM's who are in networks with MD's will be more likely to have professional orientations that are similar to MD's than those who are not in networks with MD's.

Based upon Propostion 9, the following hypotheses will be tested:

- 9.1a. DPM's who are in networks with MD's are more likely to rate podiatry higher in economic rewards than those podiatrists who are not in networks with MD's.
- 9.1b. Podiatrists who are in more homophilous networks with MD's will rate podiatry higher in economic rewards than those DPM's who are in heterophilous networks with physicians.
- 9.2a. Podiatrists who are in networks with physicians are more likely to rate podiatry higher in its legal authority than are those who are not in networks with MD's.
- 9.2b. DPM's who are in more homophilous networks with MD's will rate podiatry higher in its legal authority than those who are in heterophilous networks with MD's.
- 9.3a. DPM's who are in networks with MD's are more likely to rate podiatry higher in prestige or status than those who are not in networks with MD's.
- 9.3b. Podiatrists who are in more homophilous networks with MD's are more likely to rate podiatry higher in prestige or status than those who are in heterophilous networks with MD's.
- 9.4a. Podiatrists who are in networks with MD's are more likely to rate podiatry higher in psychological rewards from their duties than those who are not in networks with MD's.
- 9.4b. DPM's who are in more homophilous networks with MD's are more likely to rate podiatry higher in psychological rewards than those who are in heterophilous networks with MD's.

Conclusion

This chapter has sought to review network literature and research in relation to podiatry in order to derive nine major propositions. In all cases, the specific hypotheses have been justified and outlined. The next chapter will present the specific methodology, research design and operationalization of concepts used in this study. In Chapter 4 the results will be discussed.

CHAPTER III
METHODOLOGY AND RESEARCH DESIGN

Introduction

The purpose of this chapter is threefold. First, the methodological procedures involving the selection of the sample and the construction and mailing of the questionnaire will be discussed. Second, the concepts in the preceding chapter will be operationalized. Third, the statistical analysis used in this thesis to test the hypotheses will be described.

Sampling Procedures

Illinois podiatrists (DPM's)--excluding those who are currently hospital residents--who practice in the Chicago metropolitan counties of Cook, Dupage, Kane, Lake, McHenry and Will were used as the study population for this thesis. The Illinois Podiatric Medical Association (IPMA) provided the author with the March 1991 mailing list as the sampling frame from which respondents were selected.

The March 1991 mailing list included 690 DPM's practicing in Chicago and the surrounding metropolitan counties. One-half (N=345) of the names were randomly sampled from the study population. The sample size of 345 was deemed sufficient to represent the diversity and dispersion of the study population and to furnish enough cases for adequate statistical analysis. The accuracy of the mailing list is

demonstrated by the evidence that only two of the mailed questionnaires were returned as undeliverable.

Questionnaire length was kept reasonable in order to enable its completion within twenty minutes and still generate the desired information. In order that the questionnaire would derive the exact information in a clear and unbiased manner, the executive director of the IPMA--as well as the author and the director of this thesis--carefully reviewed and revised questions for lucidity and content.

Questionnaires were mailed to DPM's on March 25, 1991 and a post-card reminder was sent to non-respondents on April 5, 1991. Following the principles of the Total Design Method (TDM) suggested by Dillman (1978) correspondence was personalized (i.e., stamped envelopes were used), cover letters were personalized, the auspices of the IPMA were invoked and the post-card reminder was hand-addressed. Use of the TDM method has been shown to enhance the probability of mailed questionnaire response (Babbie 1989:241-242).

In addition to the two that were undeliverable, seven questionnaires were returned by podiatric residents rather than practitioners. Since these individuals were not included in the study population, their questionnaires were eliminated, and the effective sample size became 337. After the sample size was adjusted, the return rate became 49.9 percent--168 of the 337 respondents returned their questionnaires. This response rate is normative for successful mailed questionnaire survey research and gives a sufficient number of cases for data analysis (Babbie 1989: 241-242). It should be emphasized that in contemporary survey research a 50 percent overall response rate is a very good rate of return. Careful examination of univariate frequency

distributions indicated that there was very little item non-response (usually less than four percent). In other words, the respondents conscientiously followed directions and answered all questions that were relevant to them.

Lack of Sample Bias

Based upon conclusions about known parameters, the sampling techniques are judged to have sufficiently represented the study population. Sample distributions indicate that 35.1 percent of the respondents practice in the city of Chicago and 64.9 percent reported practicing outside the city. These geographical locational distributions are similar to the most recent comprehensive survey of Chicago area DPM's that was conducted by the IPMA in 1987. The IPMA survey found that 32.2 percent of the respondents practiced in the city of Chicago and that 67.8 percent reported practicing outside the city. Based upon mailing addresses, 59 percent of the practitioners have a city address while 41 percent have a non-city address. In addition, 18.5 percent of the respondents indicated that they are female, while 81.5 percent indicated they are male. Based upon informed inferences from the names on the mailing list, 85 percent of the practitioners were judged to be male and 15 percent female. In the 1987 IPMA survey 5.6 percent of the sample were female. However, the IPMA points out that within the last five years the enrollment of females entering podiatric colleges has drastically increased. Therefore, their numbers were expected to affect the Illinois population of DPM's in the short term (IPMA 1987). Therefore, it was anticipated that the proportion of female podiatrists in the sample would be larger than in the 1987 IPMA survey. Sample

distributions concerning both gender and geographical location of practice are within approximately five percentage points or less of the known or expected distributions.

In addition, the sample's age distribution indicates that the median age of the respondents is 39 years. The 1987 IPMA survey found precisely the same median age. The sample is therefore judged to be representative of the study population because gender, geographical location of practice and age outcomes do not deviate from known or expected distributions.

Conceptualization and Operationalization of Networks Between DPM's and MD's

Networks have traditionally been conceptualized in terms of the regularities in how people in collectivities engage in repeated social exchanges with others (Turner 1991:551). For present purposes networks between DPM's and MD's are defined on the basis of important referral patterns. DPM's will be defined to be in a referral network with MD's if referrals to MD's are among the three most important referrals they make and if referrals from MD's are among the three most important sources of their new patients. For this study networks are, therefore, defined on the basis of their importance in podiatric practice and the fact that DPM's make referrals to as well as receive them from MD's. Following network literature, this study considers networks to depend on the regularity and reciprocity of referral exchanges (Granovetter 1973, 1983; Markovsky et al. 1988; Uehara 1990; Yamagishi et al. 1988). Given this definition of networks the original sample size of 168 was divided into 114 and 47. Subsequent analysis involving podiatrists in networks

versus those who are not will compare these two components of the entire sample. Seven respondents who made no referrals to MD's were excluded from the analysis because the focus of this thesis was on those podiatrists who have some type of referral relationship with MD's. The overall analysis sample size is therefore 161 not 168. Some totals are somewhat less than 161 because of item non-response.

As indicated in Chapter Two, it is expected that DPM's who are in networks with MD's will evaluate their practices more positively than those DPM's who are not. In addition, it is expected that DPM's in networks with MD's will have more positive orientations toward podiatry than those who are not in networks with MD's. These expectations are based upon the assumptions that networks with MD's link DPM's more extensively in the health-care system and also provide DPM's more patients. In this study the role of networks is assumed to be similar to the role of friendship and kinship networks in enhancing both resources for and positive attitudes about social processes (Ekeh 1974:50-206; Levi-Strauss 1969; O'Connell 1984; Uehara 1990).

It is expected that DPM's in networks with MD's will have more positive attitudes toward podiatry. Attitudes toward podiatry will be measured by the evaluative scales discussed below.

Two specific and contrasting types of networks between DPM's and MD's will be analyzed in this study. The first is defined in terms of those DPM's who indicate that theirs is a general practice (including Corn and Callus care and Nursing Home care). This general network is assumed to involve weak ties (heterophily) with physicians rather than strong ties. As was discussed in Chapter Two, such networks are assumed to depend upon legal mandates which restrict podiatric practice to the

foot and thereby necessitate referrals to MD's for more comprehensive treatment of systemic stages of disease and other abnormalities. It is expected that DPM's in general referral networks with MD's will tend to stress the importance of expertise rather than friendship in such referrals. Furthermore, it is expected that the communication to MD's from DPM's in such networks will be rather limited (see Chapter Two). These assumptions are consistent with the traditional characteristics of networks that involve weak ties (Granovetter 1973, 1977, 1983).

The second type of network that will be analyzed in this thesis is one based upon stronger ties between DPM's and MD's. Traditionally, stronger network ties are assumed to rest upon greater similarity (or homophily) between participants (see Chapter Two). In the case of DPM's and MD's homophily is defined primarily on the basis of the trend in podiatry that is increasing similar to traditional aspects of the preparation and practices of MD's. As was discussed in Chapter Two, homophily will be defined to involve DPM's who indicate that their practices are surgically oriented and whose major referrals are to surgeons. Surgical expertise is therefore the major indicator of homophilous ties between podiatrists and physicians. Literature on trends in podiatry also stresses this issue as an important exchange in podiatric training/practice that enables fuller exchanges between DPM's and MD's (Levrío 1987; Levy 1979).

In contrast to the general network, the surgically oriented network is expected to involve more extensive communication between DPM's and MD's. Moreover, the latter network is expected to involve closer friendships between podiatrists and physicians. Third, it is anticipated that relative to DPM's in general networks, those in more homophilous

networks will have more positive orientations toward their practices and to podiatry (see Chapter Two).

After establishing the operationalization of homophilous and heterophilous networks, 74 of respondents were in homophilous and 36 were in heterophilous networks with MD's. In this categorization process four respondents were excluded because of non-response on some of the measures used to define networks. This explains why the working sample size in analyses which compare the two types of networks is 110 instead of 114. Some totals are somewhat less than 110 because of item non-response.

Operationalization of Precursors of Networks Between DPM's and MD's

Demographic Traits of Podiatrists

Demographic background traits of DPM's were operationalized using a range of items from the survey questionnaire. The first social background trait, age, was operationalized by the item which asked respondents to write how old they were on their last birthday. The second, gender, was operationalized by the item which asked respondents to circle either male or female. The third, race, was operationalized by the item which asked respondents to circle either Caucasian, African American or other; if respondents circled "other," they were requested to write their racial category. In the analysis the race, variable was defined in terms of white versus non-white since there were only 16 non-whites in the sample. It is expected that social traits of DPM's and MD's are not important in establishing networks (see Chapter Two).

Podiatric Training

Podiatric training was operationalized through use of the item which asked respondents if they had completed an approved hospital residency training program as part of their post-doctoral training. This operationalization was used because it indicates the recent trend toward hospital-based podiatric training and is also expected to be related to the increased homophily between DPM's and MD's. It is therefore expected that DPM's in more homophilous networks with MD's are more likely to have completed a hospital residency than are those DPM's in general networks with MD's (see Chapter Two).

Podiatric Practice Mandates

Practice mandates were operationalized primarily through the use of the item that asked respondents whether or not they were on a hospital staff. As has been discussed above, hospital staff appointment is assumed to reflect the most recent change in podiatric practice mandates (in Illinois as well as other states). Hospital appointment is also assumed to be related to increased homophily in the ties which link DPM's to MD's. Therefore, it is anticipated that DPM's in homophilous networks are more likely to have hospital staff appointments (see Chapter Two).

Proximity to MD's

A range of items was used to operationalize the proximity of DPM's offices to those of MD's. The first item asked respondents to indicate (by placing a "check" next to MD's) whether or not they share offices in the same building as MD's. Respondents were also asked to indicate (by placing a "check" next to MD's) whether MD's in the same building/complex were accessible for referrals. The third item asked

respondents to indicate whether or not their practice location was within ten blocks of an MD's office to whom patients could be referred. It is expected that all types of network relationships between DPM's and MD's will be strongly related to proximity (see Chapter Two).

Density of Practice Relationships

Two items were used to operationalize density or the increased number of potential relationships with others. The first item asked whether respondents were members of a group practice. A yes-no response was obtained. The second item asked respondents to indicate how many office locations currently comprised their practice. Respondents circled either "1," "2," "3," or "4 or more." For analysis purposes this variable was defined to include one location versus more than one. It was anticipated that density would be related to the probability that DPM's would be in networks with MD's (see Chapter Two).

Operationalization the Outcomes of Networks Between DPM's and MD's

Profiles of Professional Practice Activity

Two items were used to operationalize the extent to which DPM's are involved in surgery. The first item asked respondents whether or not they are certified by the American Board of Podiatric Surgery. The second item asked respondents to indicate whether or not they were considering expanding the surgical orientation of their practice in the next three years. Both items indicate the role of surgical procedures in the increased homophily between DPM's and MD's. It is therefore expected that DPM's in homophilous networks will be more likely to answer yes to these questions than those that are not (see Chapter Two).

The extent to which DPM's practice in a hospital was operationalized using several items from the survey questionnaire. The first item asked respondents to indicate the number of hours per week that they spend in hospital practice by writing the number of hours in the available space. The second item asked respondents whether or not referrals from hospitals was one of the three most important sources of their new patients. A check-no check response was offered for the second item. As was discussed in Chapter Two, it was expected that DPM's in more homophilous networks with DPM's would indicate a greater degree of hospital activity and be more likely to receive hospital referrals than those podiatrists in more heterophilous networks.

Extent of Referral Communication

Extensiveness of referral communication was operationalized through a range of items which asked respondents whether or not they exchanged surgical techniques, personal letters and face-to-face consulting in their most, second-most and third-most frequent referrals made to MD's. As was discussed in Chapter Two, it is expected that more extensive referral communication will occur between DPM's who are in more homophilous networks with MD's.

Extent of Friendship

Respondents were asked a range of items concerning friendships with the MD's to whom they refer patients. The first item asked respondents what proportions of those MD's they considered to be their personal friends. Response options were: 1 = none, 2 = some and 3 = most. The second item asked what proportions of the MD's the respondents saw outside of the office two or more times a month. Again response options were 1 = none, 2 = some and 3 = most. For analysis purposes the full

enumerated range of these scales were used in the most, second-most and third-most frequent referrals that DPM's make to MD's.. As was pointed out in Chapter Two, it was expected that DPM's in more homophilous networks with MD's would indicate a greater degree of friendship and outside the office contact with MD's than those DPM's in heterophilous networks.

Attitudes toward Podiatry

Attitudes toward podiatry were operationalized through the use of a range of questionnaire items that asked to rate podiatry on the basis of its economic rewards, its legal authority, its prestige or status and its psychological rewards. In all cases, respondents used the following three-point scale: 3 = high, 2 = moderate and 1 = low. As was pointed out in Chapter Two, it was expected that DPM's in networks with MD's would have more positive attitudes toward podiatry than those DPM's not in networks with MD's. Moreover, it was anticipated that DPM's in more homophilous networks with MD's would have more positive orientations toward podiatry than those in less homophilous networks with MD's.

Statistical Analysis

The hypotheses that were listed in Chapter Two will be tested by means of t-tests. T-tests are an appropriate form of statistical testing for the data to be analyzed in this thesis. They are useful for assessing the statistical significance of either percentage differences or differences between means. As was discussed above in this chapter, all variables in this thesis are either attributive (yes vs. no or male vs. female) or interval (as in the case of scales of friendship and the rating of podiatry). Tests of significance in this thesis will involve

testing for percentage differences in the former cases and for differences of means in the latter instances.

For purposes of hypothesis testing an alpha level of .05 was used. A somewhat higher level of alpha--about .15--was used to identify trends in the data because rather gross differences were sought in this study, and because the sample sizes were relatively small.

Conclusion

This chapter has described the methodological procedures employed in selecting the sample and in determining the lack of sample bias. Concepts from Chapter Two were operationalized, and the statistical analysis used to test the hypotheses derived in Chapter Two was described. The next Chapter will present the results of the hypothesis testing.

CHAPTER IV

RESULTS

Precursors of Professional Networks

Demographic Traits of Podiatrists

It was postulated in Chapter Two that the demographic traits of podiatrists--such as the age, gender and race--would not be related to whether or not DPM's are in general referral networks or whether they were in homophilous networks with MD's. Findings presented in Tables 1 and 2 indicate that demographic variables are not significantly related to whether or not DPM's are in networks with MD's or related to the types of networks they are in with medical doctors. Results in Tables 1 and 2 support the hypotheses that were based on the expectation that personal attributes are not related to the establishment of professional networks between MD's and podiatrists.

Table 1. T-Test Results Concerning Relationships Between Demographic Background Traits of Podiatrists and Whether or Not DPM's are in Networks with MD's.

Demographic Variables	<u>In A Network Relationship</u>		Obtained T-Test Value	Significance
	<u>YES</u> Mean or Percent- age N	<u>NO</u> Mean or Percent- age N		
Age (Mean)	41.4 (114)	41.7 (47)	.14	N.S.
Gender (% Male)	79.8 (114)	85.1 (47)	.78	N.S.
Race (% White)	87.6 (114)	95.7 (47)	1.56	N.S.

Other results not shown in these tables also indicate that it is the expertise and professional reputation of the MD's that are more important in determining referrals podiatrists make to MD's rather than the personal traits of physicians. Respondents were asked to rate the importance of a wide range of factors in their referral relationships with MD's. Of fifteen such factors, age and race were rated 11th and 14th respectively (gender was not used in this particular series of questions). Overall, results clearly show that the demographic traits of either podiatrists or physicians are not important in their network relationships.

Table 2. T-Test Results Regarding Relationships Between Demographic Background Traits of Podiatrists and Whether or Not DPM's are in Homophilous Networks with Physicians.

Demographic Variables	<u>Homophilous Network</u>		Obtained T-Test Value	Significance
	<u>YES</u> Mean or Percent-age N	<u>NO</u> Mean or Percent-age N		
Age (Mean)	40.5 (74)	44.3 (36)	1.53	N.S.
Gender (% Male)	82.4 (74)	75.0 (36)	.91	N.S.
Race (% White)	89.0 (73)	86.1 (36)	.44	N.S.

Podiatric Training

It was presumed in Chapter Two that the hospital-based residency training received by DPM's would be related to whether or not they are in network relationships with MD's and to whether they are in homophilous networks. Findings indicate that the completion of a hospital residency is significantly related to podiatrists being in a

network relationship with MD's and being in a homophilous rather than a heterophilous network.

Podiatrists who have completed an approved hospital residency are much more likely to report being in a network with MD's than those who are not in networks (57.9 percent versus 36.2 percent). This difference is statistically significant ($t(161) = 2.54, p < .05$). In addition, those DPM's who have completed a hospital residency are much more likely to be in homophilous networks rather than heterophilous networks with medical doctors (67.6 percent as compared to 38.9 percent). This difference is also statistically significant ($t(110) = 2.95, p < .05$). Overall, these results suggest that completion of an approved hospital residency is highly related both to the likelihood of a podiatrist being in networks with MD's and to being in homophilous networks with MD's.

Podiatric Practice Mandates

It was expected that podiatrists who have hospital staff appointments would be more likely to be in networks with medical doctors than DPM's who do not have such appointments. Results show that podiatrists who hold hospital staff appointments are more likely to be in network relationships with MD's and to be in homophilous rather than heterophilous networks with them. Having a hospital appointment is related to being in networks with MD's; 79.0 percent of appointment holders are in such networks compared to 61.7 percent of DPM's without hospital appointments. This difference is statistically significant ($t(161) = 2.29, p < .05$). In addition, those podiatrists who hold hospital staff appointments are much more likely to be in homophilous versus heterophilous networks with MD's than those who do not have hospital

appointments (89.2 percent as compared to 55.6 percent). This difference is also statistically significant ($t(110) = 4.30, p < .05$).

These results indicate that the recent changes in legal mandates that have given podiatrists hospital staff appointments--and which involve in-patient surgical procedures--are related to the formation of networks between podiatrists and MD's. It is worth noting that there is not only a statistically significant relationship between hospital appointment and being in networks but that the percentage differences related to such staff privileges are sizable. For example, nearly all (89.2 percent) DPM's who have hospital appointments are in homophilous (surgical) networks while slightly over one-half (55.6 percent) are in non-surgical networks with MD's. Overall, these results show that hospital staff appointments possessed by podiatrists are crucial for their network relationships with MD's.

Proximity to MD's

It was postulated in Chapter Two that the more proximate the solicited physicians were to DPM's the more likely networks between podiatrists and MD's would develop. Results found in Table 3 show that proximity variables--such as whether DPM's share offices in the same building as MD's, whether podiatrists feel that those MD's they share offices with are accessible for referrals and whether podiatrists practice within ten blocks from an MD's office--are related significantly to podiatrists being in networks with medical doctors.

Specifically, results reported in Table 3 show that podiatrists who share offices in the same building as MD's are more likely to be in a network relationship ($p < .05$). While 57.9 percent of the podiatrists who share offices in the same building as MD's are in a network

relationship, only 17.0 percent of those who do not share offices with MD's are in network relationships. Similarly, 53.5 percent of DPM's who indicated that MD's in the same building/complex are accessible for referrals are in a network relationship with medical doctors as compared to only 17.0 percent of those who do not share offices. Both of these differences are significant at the .05 level of probability. On the other hand, there was no statistically significant difference concerning DPM's practicing within ten blocks of an MD's office and whether or not podiatrists are in networks with allopathic medical physicians. In short, findings in Table 3 show that proximity to MD's is an important factor in the emergence of network relationships but only in the sense that they share offices in the same building rather than merely practicing within ten blocks of MD's.

Table 3. T-Test Results Regarding Relationships Between the Proximity to MD's of Podiatrists and Whether or Not DPM's are in Networks with Physicians.

Proximity To MD's	<u>In A Network Relationship</u>		Obtained T-Test Value	Significance
	<u>Yes</u> Percent- age N	<u>NO</u> Percent- age N		
Share Offices With MD's	57.9 (114)	17.0 (47)	5.07	p<.05
MD's In The Same Building Who Are Accessible for Referrals	53.5 (114)	17.0 (47)	4.49	p<.05
Within Ten- Blocks of MD's	93.0 (114)	93.6 (47)	.14	N.S.

It was hypothesized in Chapter Two that office sharing, accessibility of referrals and location within ten blocks of physicians' offices would not be related to the type of networks podiatrists and medical doctors are in. As hypothesized, results reported in Table 4 show that sharing offices in the same building and indicating that MD's in the same complex are accessible for referrals are not statistically related to the type of networks DPM's are in with medical doctors, even though a somewhat higher percentage of podiatrists who share offices with MD's and who indicate medical physicians in the building are accessible are in homophilous networks. However, those DPM's who practice within ten blocks of an MD's office are more likely to be in homophilous networks with allopathic medical practitioners than are those who practice further than ten blocks from MD's (98.7 percent versus 80.6 percent). This difference is statistically significant ($t(110) = 3.59, p < .05$). In summary, results in Table 4 show that close physical proximity to MD's tends to be related to being in homophilous networks with MD's and being within ten blocks of physicians is statistically related to being in homophilous networks with them.

Table 4. T-Test Results Concerning Relationships Between the Proximity to MD's of Podiatrists and Whether or Not DPM's are in Homophilous Networks with MD's.

Proximity To MD's	<u>Homophilous Network</u>		Obtained T-Test Value	Significance
	<u>Yes</u> Percent- age N	<u>NO</u> Percent- age N		
Share Offices With MD's	60.8 (74)	50.0 (36)	1.07	N.S.
MD's In The Same Building Who Are Accessible for Referrals	56.8 (74)	44.4 (36)	1.21	N.S.
Within Ten- Blocks of MD's	98.7 (74)	80.6 (36)	3.59	p<.05

Overall, findings in Tables 3 and 4 indicate that close physical proximity (i.e., DPM's and MD's sharing offices in the same building) rather than general proximity (DPM's and MD's practicing within ten blocks of one another) is related to whether or not podiatrists are in networks with MD's, but general rather than close physical proximity is important in the establishment of homophilous networks between DPM's and physicians. Proximity plays a somewhat different role in the establishment of networks as compared to the role it plays in the formation of homophilous networks.

Density of Practice Relationships

It was presumed in Chapter Two that the increased scope of podiatrists' practices--such as whether DPM's are a member of a group practice and if they practice in more than one office location--would be related to whether or not podiatrists are in network relationships with

MD's and to being in homophilous rather than heterophilous networks with medical doctors. Findings indicate that DPM's who practice in more than one office location are more likely to report being in a network relationship with medical doctors than those who are not in such networks (1.9 office locations versus 1.6 office locations). This difference approaches being statistically significant ($t(161)=2.02$, $p<.10$). Additionally, those podiatrists who practice in more than one office location are much more likely to be in homophilous networks rather than heterophilous networks with allopathic medical physicians (2.1 office locations versus 1.5 office locations). This difference is statistically significant ($t(110)=3.01$, $p<.05$). Membership in a group practice was not statistically significant in determining either a general referral network relationship or being in a homophilous network with MD's. Overall, results clearly show that the number of office locations instead of membership in a group practice is related to a greater probability of networks with medical doctors. Podiatric practice density plays an important role in network formation with MD's when DPM's practice in several offices.

Summary of Findings Concerning Precursors of Professional Networks

In this study, five types of precursors have been examined to test the likelihood of a network relationship being established between DPM's and MD's and whether a homophilous network rather than a heterophilous network is formed between them. The propositions and related hypotheses proffered in Chapter Two were strongly supported in the case of both the podiatric training and podiatric practice mandates. Podiatrists who have completed an approved hospital residency are more likely to be in a network relationship and to be in homophilous networks with MD's. DPM's

who have extended their training (i.e., completed an approved hospital residency) appear to have the increased training for and opportunity to enter networks with medical doctors. Legal mandates have enabled podiatrists to obtain hospital staff appointments. Results indicate those DPM's who have such appointments are much more likely to be in networks with allopathic medical practitioners.

Hypotheses about the proximity podiatrists are to the offices of MD's and the density of potential relationships between them were somewhat supported by results. Close physical proximity was important in the establishment of networks, while general proximity was more important in specific types of networks.

Finally, demographic background traits are not associated either with the establishment of networks between podiatrists and MD's nor are they correlates of the type of networks with MD's podiatrists are in. Overall, educational training and legal mandates are most important in determining network relationships followed by physical proximity and social density.

Outcomes of Networks Between DPM's and MD's

Differences in Professional Activity

As was stated in Chapter Two, it was expected that podiatrists who are in networks with allopathic medical practitioners would be more likely to practice in ways that are similar to those of MD's. Findings in Table 5 indicate that podiatrists who are in referral networks with medical doctors are less likely to be certified by the American Board of Podiatric Surgery (ABPS) and less likely to be considering expansion of the surgical component of their practice. These results are contrary to hypotheses 6.1a. and 6.2a. Certification by the ABPS and considering

expanding practice surgically are not related to being in networks with MD's.

In contrast, results show that DPM's who are in networks with MD's spend more hours per week in hospital practice than those who are not (5.8 hours versus 2.8 hours). This difference is statistically significant ($t(161)=2.40, p<.05$). Moreover and strikingly, 47.4 percent of those podiatrists who are in networks with allopathic medical practitioners indicated that they receive patient referrals from hospitals as compared to only 8.5 percent who are not in networks with MD's. This difference was also significant at the .05 level of probability. Table 5 shows, then, that the professional profiles of DPM's are not uniformly associated with being in professional networks with MD's. Hours per week spent in the hospital and patient referrals received from hospitals are clearly related to being in networks with medical doctors, but being certified by the ABPS and considering expansion into surgical orientation are not. Being in networks with MD's is related to some but not all aspects of practice tested in this study.

Table 5. T-Test Results Concerning Relationships Between The Profile of Professional Activity of Podiatrists and Whether or not DPM's are in Networks with MD's.

Profile of Activities	<u>In A Network Relationship</u>		Obtained T-Test Value	Significance
	<u>YES</u> Mean or Percent- age N	<u>NO</u> Mean or Percent- age N		
Percentage Certified by the American Board of Podiatric Surgery	30.7 (114)	27.7 (47)	.38	N.S.
Percentage Considering Expanding in Surgery	35.1 (114)	27.7 (47)	.91	N.S.
Mean Number of Hours per Week Spent in Hospital Practice	5.8 (114)	2.8 (47)	2.40	p<.05
Percentage Receiving Patient Referrals from Hospitals	47.4 (114)	8.5 (47)	4.99	p<.05

It was postulated in Chapter Two that podiatrists who are in more homophilous networks with medical doctors would be more likely to be certified by the ABPS, expand the surgical orientation of their practice, spend more hours per week in hospital practice and receive an increased amount of patient referrals from hospitals. Results reported in Table 6 show that while 43.2 percent of those DPM's who are in homophilous networks with MD's indicated that they are certified by the ABPS, only 5.6 of the podiatrists in heterophilous networks report that they have such certification. This difference is statistically significant ($t(110) = 4.30, p < .05$). As can be seen in Table 6,

podiatrists who are in homophilous networks with medical doctors report spending more hours per week in hospital practice than those who are in heterophilous networks (on average, 6.8 hours versus 3.5 hours). This difference of means is statistically significant ($t(110)=1.93$, $p<.10$). Moreover, nearly six in ten (59.5 percent) DPM's who are in homophilous networks with MD's as compared to only 22.2 percent of those who are not reported receiving patient referrals from hospitals among their three most important sources of new patients ($t(110)=3.88$). This difference is statistically significant at the .05 level of probability.

Table 6. T-Test Results Concerning Relationships Between The Profile of Professional Activity of Podiatrists and Whether or not DPM's are in Homophilous Networks with MD's.

Profile of Activities	Homophilous Network		Obtained T-Test Value	Significance
	YES Mean or Percent- age N	NO Mean or Percent- age N		
Percentage Certified by the American Board of Podiatric Surgery	43.2 (74)	5.6 (36)	4.30	$p<.05$
Percentage Considering Expansion in Surgery	31.1 (74)	36.1 (36)	.52	N.S.
Mean Number of Hours per Week Spent in Hospital Practice	6.8 (74)	3.5 (36)	1.93	$p<.10$
Percentage Receiving Patient Referrals from Hospitals	59.5 (74)	22.2 (36)	3.88	$p<.05$

Overall, findings in Table 6 provide somewhat more support for the hypotheses than those in Table 5. Spending more time in hospitals and receiving more patient referrals from hospitals are related to being in networks with MD's, but surgical certification and planning to expand practice surgically are not. However, surgical certification, hours worked in hospitals, and receiving new patient referrals from hospitals are all related to being in homophilous rather than heterophilous networks with physicians. There are considerable differences between the practice activities of podiatrists in homophilous networks with MD's and those who are in heterophilous networks with them. This explains why differences in professional practice are less apparent when podiatrists in networks in general are compared to DPM's in no networks with MD's.

Extent of Referral Communication

It was presumed in Chapter Two that the more involved DPM's and MD's are in networks the more extensively podiatrists will communicate with MD's. The extensiveness of referral communication was measured by comparing the percentages of respondents who exchange surgical techniques, personal letters and face-to-face consulting. Communication exchanged between podiatrists and medical doctors was expected to be greater if DPM's are in networks with MD's and if such networks are homophilous.

Prior to discussing the findings in Table 7, it should be pointed out that the most frequent referral DPM's reported making were more likely to be to general practitioners and internists, while the second-most frequent referral reported by respondents were typically made to surgeons, and the third-most frequent referral reported by DPM's tended

to be to MD specialists (diabetic specialists and dermatologists, for example).

Most of the results in Table 7 are not statistically significant. Podiatrists who are in networks with allopathic medical practitioners are more likely to exchange personal letters--in their most frequent referral--than are those who are not in networks with MD's (59.7 percent versus 39.1 percent). This difference is statistically significant ($t(160)=2.38, p<.05$). There are also similar but not statistically significant percentage differences in the second- and third-most frequent referrals with regard to personal letters and face-to-face consulting. In both cases, podiatrists who are in network relationships with MD's are somewhat more likely to report exchanging personal letters and engaging in face-to-face consulting than are those DPM's who are not in networks. The same trends in findings are found with respect to face-to-face consulting in the second- and third-most frequent referrals. That a similar trend in results is found for the second- but not the third-most frequent referral probably results because the second-most frequent referral tends to involve referrals to surgeons, whereas the third-most frequent referral tends to involve non-surgical specialists. In summary, findings in Table 7 tend to show that the personal letters, face-to-face consulting, and surgical techniques are more likely to be involved in referrals where podiatrists are in networks than when they are not. However, most such differences are not large. In short, being in networks with MD's does not substantially affect how extensively DPM's communicate with MD's.

Table 7. T-Test Results Concerning Relationships Between the Extent of Referral Communication from Podiatrists in their Three Most-Frequent Referrals to MD's and Whether or Not DPM's are in Networks with MD's.

Type of Communication	In A Network Relationship		Obtained T-Test Value	Significance
	YES Percent- age N*	NO Percent- age N*		
Percentage Ex-changing Surgical Techniques (Most-Frequent Referral)	17.5 (114)	19.6 (46)	.30	N.S.
Percentage Ex-changing Surgical Techniques (Second Most-Frequent Referral)	22.5 (111)	13.0 (46)	1.36	N.S.
Percentage Ex-changing Surgical Techniques (Third Most-Frequent Referral)	18.5 (108)	26.2 (42)	1.04	N.S.
Percentage Ex-changing Personal Letters (Most-Frequent Referral)	59.7 (114)	39.1 (46)	2.38	p<.05
Percentage Ex-changing Personal Letters (Second Most-Frequent Referral)	44.1 (111)	30.4 (46)	1.60	N.S.
Percentage Ex-changing Personal Letters (Third Most-Frequent Referral)	42.6 (108)	33.3 (42)	1.04	N.S.
Percentage Ex-changing Face-to-Face Consulting (Most-Frequent Referral)	32.5 (114)	34.8 (46)	.28	N.S.
Percentage Ex-changing Face-to-Face Consulting (Second Most-Frequent Referral)	28.8 (111)	17.4 (46)	1.50	N.S.

Table 7 cont.

Type of Communication	In A Network Relationship		Obtained T-Test Value	Significance
	YES Percent- age N*	NO Percent- age N*		
Percentage Ex- changing Face-to- Face Consulting (Third Most- Frequent Referral)	33.0 (109)	21.4 (42)	1.40	N.S.

* Totals vary slightly due to item non-response on referred questions.

It was also hypothesized in Chapter Two that DPM's who are in homophilous networks with MD's would be more likely to exchange surgical techniques, personal letters and engage in face-to-face consulting than would those in heterophilous networks. Results reported in Table 8 show that podiatrists who are in homophilous networks with medical doctors-- in their most-frequent referral to MD's--are more likely to exchange surgical techniques than those who are in heterophilous networks (20.3 percent versus 5.6 percent). This difference approaches being statistically significant ($t(110) = -2.02, p < .10$). In the second- and third-most frequent referrals that DPM's make to MD's, those podiatrists who are in homophilous networks also tend to be more likely to engage in face-to-face consulting ($p < .15$). While 34.7 percent of the podiatrists who are in homophilous networks with medical doctors engage in face-to-face consulting in the second-most frequent referral, only 17.1 percent of those DPM's who are in heterophilous networks do so. Similarly, 38.9 percent of DPM's in homophilous networks as compared to only 21.2 percent of podiatrists in homophilous networks engage in face-to-face consulting during their third-most frequent referral. The other results in Table 8 do not indicate substantial or statistically meaningful

differences in communication between podiatrists in homophilous and heterophilous networks.

Table 8. T-Test Results Concerning Relationships Between the Extent of Referral Communication from Podiatrists in their Three Most-Frequent Referrals to MD's and Whether or Not DPM's are in Homophilous Network with MD's.

Type of Communication	Homophilous Network		Obtained T-Test Value	Significance
	YES Percent- age N*	NO Percent- age N*		
Percentage Ex- changing Surgical Techniques (Most- Frequent Referral)	20.3 (74)	5.6 (36)	2.02	p<.10
Percentage Ex- changing Surgical Techniques (Second Most-Frequent Referral)	25.0 (72)	14.3 (35)	1.26	N.S.
Percentage Ex- changing Surgical Techniques (Third Most-Frequent Referral)	19.7 (71)	15.2 (33)	.56	N.S.
Percentage Ex- changing Personal Letters (Most- Frequent Referral)	62.2 (74)	50.0 (36)	1.21	N.S.
Percentage Ex- changing Personal Letters (Second Most-Frequent Referral)	40.3 (72)	51.4 (35)	1.09	N.S.
Percentage Ex- changing Personal Letters (Third Most-Frequent Referral)	45.1 (71)	36.4 (33)	.83	N.S.

Table 8 cont.

Type of Communication	<u>Homophilous Network</u>		Obtained T-Test Value	Significance
	<u>YES</u> Percent- age N*	<u>NO</u> Percent- age N*		
Percentage Ex-changing Face-to-Face Consulting (Most-Frequent Referral)	29.7 (74)	30.6 (36)	.09	N.S.
Percentage Ex-changing Face-to-Face Consulting (Second Most-Frequent Referral)	34.7 (72)	17.1 (35)	1.89	p<.15
Percentage Ex-changing Face-to-Face Consulting (Third Most-Frequent Referral)	38.9 (72)	21.2 (33)	1.79	p<.15

* N's vary slightly due to item non-response on communication question.

Overall, results reported in both Tables 7 and 8 show that professional communication between DPM's and MD's is somewhat more extensive in homophilous networks than in heterophilous networks, but that this difference is not large. Results tend to show that extensiveness of communication depends more on the type of physician referred to than on the fact that DPM's are in networks with MD's.

Extent of Friendship

It was postulated in Chapter Two that the more involved podiatrists and medical doctors are in networks the more likely DPM's would consider MD's as friends and the more likely they would interact socially with physicians. Results in Table 9 indicate considerable support for the hypotheses. Results reported in Table 9 show that in the most-frequent, second-most frequent and third-most frequent referrals made by DPM's to

MD's podiatrists who are in network relationships with MD's report a larger proportion of medical doctors as friends than those who are not in networks. These differences are all statistically significant at or near the .05 level of probability.

Similar results are reported in Table 9 with regard to the proportion of physicians podiatrists report seeing socially outside the office. Two of three such differences are significant at or near the .05 level of probability and the third is in the predicted direction. Overall, then, results in Table 9 confirm the expectations that podiatrists who are in networks with MD's are more likely to consider physicians friends and to interact socially with them than are DPM's not in networks with MD's. Patterns of friendships and patterns of social interactions outside the office between DPM's and MD's are highly correlated with whether or not they are in networks.

Table 9. T-Test Results Concerning Relationships of the Extent of Friendship and Personal Contact Between DPM's & MD's --in the Three Most-Frequent Referrals to MD's--and Whether or Not Podiatrists are in Networks with MD's.

Personal Friend- ship/Social Contacts	<u>In A Network Relationship</u>		Obtained T-Test Value	Significance
	<u>YES</u> Mean N* (Most=3, Some=2, None=1)	<u>NO</u> Mean N*		
Mean Proportion of Friendships with MD's (Most-Frequent Referral)	1.8 (114)	1.6 (47)	2.01	p<.10
Mean Proportion of Friendships with MD's (Second Most- Frequent Referral)	1.5 (111)	1.3 (47)	2.73	p<.05

Table 9 cont.

Personal Friend- ship/Social Contacts	In A Network Relationship		Obtained T-Test Value	Significance
	<u>YES</u> Mean N* (Most=3, Some=2, None=1)	<u>NO</u> Mean N*		
Mean Proportion of Friendships with MD's (Third Most- Frequent Referral)	1.5 (108)	1.2 (43)	2.44	p<.05
Mean Proportion of Social Contact Two or More Times A Month (Most- Frequent Referral)	1.5 (114)	1.3 (47)	1.18	N.S.
Mean Proportion of Social Contact Two or More Times A Month (Second Most-Frequent Referral)	1.4 (111)	1.2 (47)	2.35	p<.05
Mean Proportion of Social Contact Two or More Times A Month (Third Most-Frequent Referral)	1.3 (108)	1.1 (43)	2.15	p<.10

* Totals vary slightly due to item non-response on Friendship and social contact questions.

It was postulated in Chapter Two that podiatrists who are in homophilous networks with medical doctors would be more likely to report being friends and socially interacting with MD's than those DPM's who are in heterophilous networks with physicians. Results presented in Table 10 show no statistical support for any of these hypotheses. While friendship and social interaction patterns are related to whether or not DPM's are in networks with MD's, friendship ties and social interaction are not related to the types of networks that exist between podiatrists

and MD's. Closeness of ties between practitioners are related to the emergence of networks per se.

Table 10. T-Test Results Concerning Relationships of the Extent of Friendship and Personal Contact Between DPM's & MD's --in the Three Most-Frequent Referrals to MD's--and Whether or Not Podiatrists are in Homophilous Networks with MD's.

Personal Friend- ship/Social Contacts	In A Network Relationship		Obtained T-Test Value	Significance
	YES Mean N* (Most=3, Some=2, None=1)	NO Mean N *		
Mean Proportion of Friendships with MD's (Most-Frequent Referral)	1.8 (74)	1.8 (36)	.06	N.S.
Mean Proportion of Friendships with MD's (Second Most- Frequent Referral)	1.6 (72)	1.5 (35)	.75	N.S.
Mean Proportion of Friendships with MD's (Third Most- Frequent Referral)	1.5 (71)	1.3 (33)	1.07	N.S.
Mean Proportion of Social Contact Two or More Times A Month (Most- Frequent Referral)	1.5 (74)	1.4 (36)	.77	N.S.
Mean Proportion of Social Contact Two or More Times A Month (Second Most-Frequent Referral)	1.4 (72)	1.3 (35)	.90	N.S.
Mean Proportion of Social Contact Two or More Times A Month (Third Most-Frequent Referral)	1.3 (71)	1.3 (33)	.45	N.S.

* Totals vary slightly due to item non-response on friendship and social contact questions.

Attitudes toward Podiatry

As was discussed in Chapter Two, it was expected that DPM's who are in networks with MD's would be more likely to have professional orientations that are similar to medical doctors than those who are not in networks with allopathic medical practitioners. More specifically, it was hypothesized that DPM's in networks with MD's would evaluate podiatry higher than those not in networks.

Findings in Table 11 show that podiatrists who are in networks with allopathic medical physicians give a higher mean rating to the psychological rewards of podiatry than do those DPM's who are not in such networks (mean rating = 2.5 versus 2.2). This difference is statistically significant ($t(156) = 2.39, p < .05$). DPM's who are in networks with MD's also tend to give a higher mean rating to the economic rewards of podiatry (mean rating = 2.3 versus 2.1), legal authority (mean rating = 2.0 versus 1.8) and prestige or status (mean rating = 2.1 versus 1.9). Only the first two of these differences approximate being statistically significant at the .05 level of probability. Therefore, findings in Table 11 indicate considerable support for the idea that podiatrists who are in networks with medical doctors rate podiatry higher than do those DPM's who are not in networks with physicians.

Table 11. T-test Results Concerning Relationships Between Attitudes of DPM's Toward Podiatry as a Profession and Whether or Not Podiatrists are in Networks with MD's.

Aspects of Podiatry	<u>In A Network Relationship</u>		Obtained T-Test Value	Significance
	<u>YES</u> Mean N (High=3,Medium=2,Low=1)	<u>NO</u> Mean N		
Mean Rating of Economic Rewards	2.3 (110)	2.1 (46)	1.76	p<.15
Mean Rating of Legal Authority	2.0 (110)	1.8 (46)	2.04	p<.10
Mean Rating of Prestige or Status	2.1 (110)	1.9 (46)	1.52	N.S.
Mean Rating of Psychological Rewards	2.5 (110)	2.2 (46)	2.39	p<.05

It was also hypothesized in Chapter Two that DPM's who are in homophilous networks with medical doctors would rate various aspects of podiatry higher than would those podiatrists in heterophilous networks. Results reported in Table 12 indicate that those DPM's who are in homophilous networks with MD's give a considerably higher mean rating to the legal authority of podiatry than do those podiatrists who are in heterophilous networks (mean rating = 2.1 versus 1.7). This difference is statistically significant ($t(106) = 2.72, p < .05$). The remainder of the results in Table 12 show no support for the hypotheses.

Table 12. T-test Results Concerning Relationships Between Attitudes of DPM's Toward Podiatry as a Profession and Whether or Not Podiatrists are in Homophilous Networks with MD's.

Aspects of Podiatry	<u>Homophilous Network</u>		Obtained T-Test Value	Significance
	<u>YES</u> Mean N (High=3,Medium=2,Low=1)	<u>NO</u> Mean N		
Mean Rating of Economic Rewards	2.3 (72)	2.2 (34)	.81	N.S.
Mean Rating of Legal Authority	2.1 (72)	1.7 (34)	2.72	p<.05
Mean Rating of Prestige or Status	2.1 (72)	2.0 (34)	.79	N.S.
Mean Rating of Psychological Rewards	2.5 (72)	2.4 (34)	.35	N.S.

Overall, the results in Tables 11 and 12 can be compared as follows. Podiatrists who are in networks with MD's do give higher ratings to most aspects of podiatry analyzed in this thesis. However, the type of network DPM's are in makes little difference in ratings of aspects of podiatry, except that DPM's in homophilous networks rate podiatry higher in terms of legal authority than do those who are in heterophilous networks.

Summary of Findings Concerning the Outcomes of Networks Between DPM's and MD's

Four types of outcomes have been examined in this thesis to test whether DPM's are influenced by their participation in networks. The propositions and related hypotheses in relation to podiatrists being in general referral networks with medical doctors were strongly supported in the case of both the extent of friendships and attitudes toward

podiatry. DPM's who are in a network relationship with MD's are more likely to be friends and socially interact outside of the office two or more times a month with those medical doctors. Podiatrists who are in a general referral network with allopathic medical doctors were found to be more likely to rate podiatry higher in economic rewards, legal authority, prestige or status and psychological rewards than those who are not in such networks.

The propositions and related hypotheses in relation to podiatrists being in homophilous networks with allopathic medical practitioners were supported in the case of the profile of professional activity. Being certified by the ABPS, spending more hours per week in hospital practice and receiving a higher percentage of patient referrals from hospitals were characteristic of those DPM's who were in homophilous networks with DPM's. In contrast, predictions regarding being in networks per se were not consistently supported by results. The referral communication was more important in the outcomes of homophilous networks vis-a-vis general referral networks. That is, podiatrists in homophilous networks are more likely to communicate with MD's through exchanging surgical techniques and engaging in face-to-face consulting than those in general referral networks. Legal authority was the only attitude toward podiatry that varied by the type of network podiatrists are in with MD's. Finally, friendships and social contacts are not related to the type of network podiatrists are in, but they are highly related to being in networks per se.

Overall, the extent of friendships and attitudes toward podiatry are most clearly related to being in networks per se, followed by profiles of professional activities and the extent of referral

communication. Profiles of professional activities was the most important followed by the extent of referral communication, attitudes toward podiatry and the extent of friendships in analyzing the differences between homophilous and heterophilous networks.

Conclusions

In this chapter the findings used to test hypotheses related to the precursors and outcomes of networks between DPM's and MD's have been reviewed. In the following chapter the implications of these findings will be discussed and conclusions drawn concerning the relationships between this thesis and future research on professional networks.

CHAPTER V

CONCLUSIONS

The focus of this study has been the relationships podiatrists have with physicians. Analyses of the referral networks that exist between DPM's and MD's suggest that professional networks develop in ways which both regularize how patients are treated and the ways in which practitioners in two different and potentially conflicting areas of health-care actually accomodate each other. In this chapter the role of professional networks play will be discussed from the viewpoints of network literature and the occupational sociology literature.

Emergence of Professional Networks

In this thesis network analysis has provided a means for understanding the resolution of competition between allopathic medicine and podiatry. Evidence of the role of networks in regulating inter-occupational contact has been developed through analyses of both the precursors of networks and their outcomes.

Findings of this thesis show that podiatrists who have completed an approved hospital residency and have hospital staff appointments are much more likely both to be in networks with MD's and to be in homophilous (surgically oriented) networks with them. Recent changes in podiatric training and practice mandates are key structural correlates of podiatrists being in networks with MD's. More specifically, podiatric training and practice mandates are crucial factors in establishing jurisdictional homophily between podiatrists and medical doctors, and

this professional likeness between podiatrists and MD's leads to complementary rather than conflicting relationships. It is important to stress that this thesis has defined networks in terms of regular and reciprocal patient referrals.

Outcomes of this thesis indicate that heterophilous as well as homophilous networks develop between podiatrists and MD's. For example, heterophilous networks occur when podiatrists refer their patients to medical specialists for treatment of the systemic stages of abnormalities. This thesis has found that both heterophilous and homophilous network relationships are associated with more friendship ties and social contacts among MD's and DPM's in networks than among those podiatrists who are not in networks with MD's. This result is important since it supports the conclusion that professional networks between podiatrists and physicians lead to interpersonal ties that also have the potential to reduce conflicts over practice and treatment. These findings are consistent with previous network literature, namely, that professional ties increase interpersonal ties (Homans 1950; Lin et al. 1985).

Two expected precursors of professional networks--proximity to MD's and density of practice relationships--played a more qualified role in networks. The author expected that practice proximity would be important in the formation of all networks between MD's and podiatrists. Results indicate that close physical proximity instead of general proximity is crucial for heterophilous networks to form, but general rather than close proximity is important for homophilous networks to be established between podiatrists and medical doctors. These findings mean that the probability of podiatrists and MD's forming heterophilous networks is

related to practicing in the same building/complex. However, DPM's and MD's who are in surgical (i.e., homophilous) networks are not necessarily in close physical proximity. Overall, results concerning DPM's show that those who have hospital appointments and spend more time in hospital practice exchange surgical techniques more often with MD's and receive more referrals from hospitals. Since these activities are characteristic of a medical doctor, DPM's develop homophilous networks with MD's. Therefore, the hospital setting is an important prerequisite setting for homophily to occur between podiatrists and medical doctors.

Galaskiewicz's (1985) finding is analogous to the finding in the thesis that close physical proximity is not necessarily crucial for networks to form. He found that even though professionals were more proximate to one another when neither belonged to the same professional association, a homophilous relationship did not develop. With regard to general proximity being important for homophilous networks, McPherson and Smith-Lovin (1987) found that the greater the average distance between two individuals in voluntary professional associations, the more likely their relationships were to be homophilous. Results show that professional activity rather than its location is crucial for homophilous networks to emerge.

Podiatrists participating in group practices is a new phenomenon in podiatric medicine (IPMA 1987). Therefore it is premature to fully explain the impact that group practice participation has on networks. However, number of locations rather than the size of the practice appears to be very important in the emergence of homophilous professional networks. Podiatrists who practice in more than one office location are more likely to practice in hospitals (Grimm and Chumbler

1991b). Hospital office locations increase the chances of consulting and sharing surgical techniques with MD's. In fact, interpersonal communication between DPM's and MD's become more extensive when both are continually working in the same professional arena (communication will be discussed in greater detail later in this chapter). These findings are analogous to Perrucci and Targ's (1982) conclusions concerning the role of support networks in mental illness. They found that those people who have numerous others to turn for support during stressful life events were more likely to choose medical-psychiatric explanations for their behavior and to take preventive action to seek help from a medical professional. Similarly, DPM's with multiple practice locations (one of which is in a hospital) have a considerably increased probability of developing homophilous relationships with MD's.

Effects of Professional Networks

Friendship patterns between DPM's and MD's and attitudes of DPM's toward podiatry were found to be highly related to whether or not podiatrists are in networks with MD's. However, the extent of friendship and social contact rates were not related to the type of networks podiatrists and allopathic medical practitioners are in. These results imply that both homophilous and heterophilous networks lead to closer interpersonal relationships, and, this may in turn limit potential conflict even more.

Podiatrists who are in networks with MD's rate podiatry higher on all aspects than those who are not in a network at all with medical doctors. Also, only those DPM's who are in homophilous networks with MD's rate podiatry higher in legal authority. These findings mean that networks appear to influence podiatrists in what they do as well as its

rewards. That is, those podiatrists who develop and continue network relations with medical doctors appear to feel more autonomous in their podiatric duties than those DPM's who are not in networks. Podiatrists who are in homophilous networks with MD's may rate podiatry higher in legal authority precisely because they themselves are more surgically oriented and have in-patient hospital privileges that make their practices not only more similar to MD's but have in fact increased their occupational turf.

Findings concerning the extent of friendship and social contact are analogous to Granovetter's (1973, 1983) analysis of the strength of weak ties. He found that acquaintanceships between professionals become more intense in any network they are in. In reference to attitudes toward podiatry, results reported in this thesis are similar to Fischer et al.'s (1977) conclusion that work-related groups are more likely to be homophilous on the basis of socioeconomic status. That is, the legal authority aspect of podiatry, for example, determines the types of opportunities for network contacts between DPM's and MD's. Podiatrists who have been granted more legal authority are more likely to be in homophilous relationships with medical doctors.

Findings concerning the profile of podiatrists' professional activities and extensiveness of the referral communication with MD's show that activities and communication are related to the type of network podiatrists are in with medical doctors. More specifically, surgical certification, hours worked in hospitals, and receiving new patient referrals from hospitals are crucial outcomes of homophilous rather than heterophilous networks between DPM's and MD's. Findings in this thesis also show that podiatrists who are in homophilous networks

with MD's are more likely to communicate with MD's by exchanging surgical techniques and engaging in face-to-face consulting. These findings mean that DPM's who are in homophilous networks with MD's have practices that are much more similar to medical doctors than podiatrists who are in heterophilous networks. These findings also suggest that podiatrists who are in homophilous networks with MD's communicate more subjectively and are more directly associated with MD's than DPM's who are in heterophilous networks with physicians.

Findings regarding the profile of professional activity parallel McPherson and Smith-Lovin's (1987) study on homophily in professional voluntary organizations. They found that homophily is produced by the restricted opportunity structure offered by the group and the homophilous choices made within the group. In relation to podiatry, legal mandates allow only those DPM's who have certification privileges that are similar to MD's to enter into homophilous networks with physicians. The extensiveness of referral communication between DPM's and MD's is similar to Knoke's (1990) findings in his study of networks of political action. He found that embeddedness in a strongly partisan political environment and talking about political matters with others were significant factors in increasing election participation. Similarly, podiatrists who are embedded in surgical networks with MD's will communicate extensively with those medical doctors about treatment and techniques. Thus, DPM's and medical doctors mutually create normative expectations that influence their orientations and actions about delivery of health-care.

Implications for the Sociological Study of Occupations

Attributive differences that characterize professions versus would-be or semi-professions and the continuous conflicting relations between professions and semi-professions have been overstudied by occupational sociologists (Hodson and Sullivan 1990:258-284; Pavalko 1988:19-29; Ritzer and Walczak 1986:68-69; Rothman 1987:60-86). Results from this study suggest that there are at least two ways that professional networks decrease occupational conflict. The first is a form of changing regulations that involves the alterations in professional practice mandates. Similar to the results of this study, Galaskiewicz (1985) found that corporate giving officers turned to those in the network who had better knowledge or a higher status during times of potential conflict. Furthermore, he found that membership in a professional association was an important advantage for semi-professionals, because it increased their likelihood of establishing networks with full-time professionals and broke down potential barriers to professional activities. Therefore, professional associations can link people who otherwise would not have regularized professional relationships. Galaskiewicz's findings directly parallels Durkheim's (1893/1964) concept of organic solidarity which conceives of society of being held together by the different yet connected occupational activity. Parallel to Galaskiewicz (1985) and Durkheim (1893/1964), this study has shown that two different fields (podiatry and allopathic medicine) develop inter-occupational solidarity through professional activity networks.

The second type of limitation to interoccupational conflict analyzed in this study involves podiatrists and medical doctors engaging in political processes to consolidate their monopolies over specific

areas of occupational territory. Findings of this study show that resolution of occupational conflict results in regularized relationships between podiatry and allopathic medicine. These findings mean that in the areas in which podiatry and allopathic medicine have developed regularized and consolidated professional activity resolutions to potential conflicts have occurred. McPherson and Smith-Lovin's (1987) concept of "choice homophily" is analogous to the results found in this study. They pointed out that all groups are heterogeneous, and pairs within groups are formed primarily on the basis of dyadic similarity; groups merely provide a local arena for the formation of homophilous ties. In short, implications for the occupational sociology literature are to bring Durkheim's organic solidarity and the process model of professions advocates together through continuing analyses of inter-professional networks.

Implications for Future Research

Further research on this topic is necessary before any final implications and conclusions can be posited with respect to the professional networks between podiatrists and medical doctors. Obviously, studies of other pairs of professions are also necessary, for example, the examination of professional relationships between optometrists and ophthalmologists and between psychologists and psychiatrists. Another type of study outside of the health-care sector would be the professional relationships between lawyers and realtors.

Caution is urged in using this data as this study analyzed networks using only bivariate statistical analysis. Bivariate analysis is restricted to the size and direction of the association between the dependent and independent variables (Grimm and Wozniak 1990:369, 427).

Future studies should involve multivariate analysis of network relationships, in particular multiple regression approaches. Multiple regression analysis has important uses concerning the network relationships between DPM's and MD's. For instance, one can find out which among many independent variables (i.e., DPM's completion of an approved hospital residency, DPM's membership on the medical staff of hospitals, or the sharing of offices in the same building/complex as MD's) are the most important influences on a dependent variable such as podiatrists and medical doctors being in homophilous networks rather than heterophilous networks.

What is clear, based on the results of this study, is that professional networks do link podiatrists and physicians and that such networks have important consequences for professional activities. These findings show that further studies of professional networks should advance understanding of both networks and professions.

APPENDIX A

PRACTICE OF PODIATRIC MEDICINE QUESTIONNAIRE

ID# _____

To get a better idea about relationships DPM's have with other health-care practitioners, we would like to ask you some questions about yourself and your daily/weekly routine as a DPM.

1. How old were you on your last birthday? _____
2. You are (circle one) 1 Male 2 Female
3. You are (circle one)
 1 Caucasian 2 African American 3 Other (please specify _____)
4. Have you completed an approved residency training program (circle one)
 1 YES (IF YES, HOW LONG WAS IT? _____ yrs.)
 2 NO (IF NO GO TO 5)
5. Have you completed an approved preceptorship? (circle one)
 1 YES (IF YES, HOW LONG WAS IT? _____ yrs.)
 2 NO (IF NO, GO TO 6)
6. Are you a member on the medical staff of a hospital? (circle one)
 1 YES (IF YES, HOW MANY HOURS PER WEEK DO YOU SPEND IN HOSPITAL PRACTICE _____)
 2 NO (IF NO, GO TO 7)
7. Are you certified by the American Board of Podiatric surgery? (circle one) 1 YES 2 NO
8. Are you certified by the American Board of Podiatric Orthopedics? (circle one) 1 YES 2 NO

9. Are you certified by the American Board of Podiatric Public Health? (circle one)
 1 YES 2 NO
10. Is your practice a solo practice? (circle one)
 1 YES 2 NO
11. Are you a member of a group practice? (circle one)
 1 YES 2 NO
12. Is the practice that you work in a professional corporation?
 (circle one) 1 YES 2 NO
13. In how many office locations do you currently practice?
 (circle one) 1 2 3 4 or more
14. Overall, how would you describe your practice of podiatric medicine? (check no more than two)
- General Practice _____
- Surgically Oriented _____
- Surgical Referral Practice _____
- Primarily Sports Medicine _____
- C & C Care _____
- Nursing Home/Old Age _____
- Other (specify) _____
15. In the near future (2 to 3 years) are you considering expanding into any of these areas? (check as many as apply)
- Surgically Oriented _____
- Surgical Referral Practice _____
- Primarily Sports Medicine _____
- C & C Care _____
- Nursing Home/Old Age _____
- Other (specify) _____

c. hospital referrals _____ f. Other (specify _____
_____)

23. What are the three most frequent types of referrals you make? (select only three)

a. MD referrals _____ d. nursing home referrals _____

b. DPM referrals _____ e. other (specify _____
_____)

c. hospital referrals _____

24. Do you refer some of your patients to any of the following MD's? (circle either YES or NO for each), If you answer NO for all go to q.27.

	<u>YES</u>	<u>NO</u>
general practitioners (M.D.s)	1	2
diabetic medical specialists	1	2
orthopedic surgeons (M.D.s)	1	2
pediatricians	1	2
dermatologists	1	2
other(s) (specify _____)	1	2

25. How important are each of the following when you make referrals to other M.D.'s? (circle one number for each, where 1 = very unimportant and 10 = very important)

	very unimportant					very important				
	1	2	3	4	5	6	7	8	9	10
building your practice	1	2	3	4	5	6	7	8	9	10
enhancing your professional reputation	1	2	3	4	5	6	7	8	9	10
proximity of other office	1	2	3	4	5	6	7	8	9	10
expertise	1	2	3	4	5	6	7	8	9	10
building your respectability	1	2	3	4	5	6	7	8	9	10
friendship ties	1	2	3	4	5	6	7	8	9	10

the reputation of the other MD	1	2	3	4	5	6	7	8	9	10
legal restrictions	1	2	3	4	5	6	7	8	9	10
ethnicity (e.g., Polish, Greek) of the MD	1	2	3	4	5	6	7	8	9	10
race of the MD	1	2	3	4	5	6	7	8	9	10
age of the MD	1	2	3	4	5	6	7	8	9	10
religious affiliation of the MD	1	2	3	4	5	6	7	8	9	10
medical school attended by MD	1	2	3	4	5	6	7	8	9	10
public assistance like medicare	1	2	3	4	5	6	7	8	9	10
group insurance like BC/BS	1	2	3	4	5	6	7	8	9	10

26a. To which three specialty types of physicians (MD's) do you most frequently refer your patients? (list from most frequent to less frequent)

1. _____ (How many of these are your personal friends?)
(circle one) MOST SOME NONE

(How many of these do you see outside of the office two or more times a month?) (circle one)
 MOST SOME NONE

2. _____ (How many of these are your personal friends?)
(circle one) MOST SOME NONE

(How many of these do you see outside of the office two or more times a month?) (circle one)
 MOST SOME NONE

3. _____ (How many of these are your personal friends?)
(circle one) MOST SOME NONE

(How many of these do you see outside of the office two or more times a month?) (circle one)
 MOST SOME NONE

- b. For each of the three types of physicians you listed above, how many of the following communication methods are involved in your referral relationship with the M.D.? (check as many as apply for each)

	(1) Most Frequent Referral	(2) Second-Most Frequent Referral	(3) Third-Most Frequent Referral
phone call	_____	_____	_____
medical history	_____	_____	_____
medical records	_____	_____	_____
surgical techniques	_____	_____	_____
personal letters	_____	_____	_____
face-to-face consulting	_____	_____	_____

27. Do you make referrals to any of the following types of DPMS? (circle either YES or NO for each). If you answer NO for all, go to q 30).

	<u>YES</u>	<u>NO</u>
surgical podiatrists	1	2
sports medicine specialists	1	2
pedopodiatrists	1	2
podiatric orthopedists	1	2
other(s) (specify _____)	1	2

28. How important are each of the following when you make referrals to other DPMs (select one number for each, where 1 = very unimportant and 10 = very important)

	very unimportant					very important				
building your practice	1	2	3	4	5	6	7	8	9	10
enhancing your professional reputation	1	2	3	4	5	6	7	8	9	10
proximity of office	1	2	3	4	5	6	7	8	9	10
expertise	1	2	3	4	5	6	7	8	9	10
building your respectability	1	2	3	4	5	6	7	8	9	10
friendship ties	1	2	3	4	5	6	7	8	9	10
reputation of the other DPM	1	2	3	4	5	6	7	8	9	10
legal restrictions	1	2	3	4	5	6	7	8	9	10
ethnicity (e.g., Polish, Greek) of the DPM	1	2	3	4	5	6	7	8	9	10
race of DPM	1	2	3	4	5	6	7	8	9	10
age of DPM	1	2	3	4	5	6	7	8	9	10
religious affiliation of the DPM	1	2	3	4	5	6	7	8	9	10
podiatry school attended by the other DPM	1	2	3	4	5	6	7	8	9	10
public assistance like medicare	1	2	3	4	5	6	7	8	9	10
group insurance like BC/BS	1	2	3	4	5	6	7	8	9	10

29a. To which three types of DPM's do you most frequently refer your patients? (list from most frequent to less frequent)

1. _____ (How many of these are your personal friends?)
(circle one) MOST SOME NONE

(How many of these do you see outside the office two or more times a month?) (circle one)
MOST SOME NONE

2. _____ (How many of these are your personal friends?)
(circle one) MOST SOME NONE

(How many of these do you see outside the office two or more times a month?) (circle one)
MOST SOME NONE

3. _____ (How many of these are your personal friends?)
(circle one) MOST SOME NONE

(How many of these do you see outside the office two or more times a month?) (circle one)
MOST SOME NONE

b. For each of the three types of DPM's you listed above, how many of the following communication methods are involved in your referral relationship with the DPM? (check as many as apply for each)

	Most Frequent <u>Referral</u>	Second-Most Frequent <u>Referral</u>	Third-Most Frequent <u>Referral</u>
phone call	_____	_____	_____
medical history	_____	_____	_____
medical records	_____	_____	_____
surgical techniques	_____	_____	_____

personal
letters _____

face-to-face
consulting _____

30. Rate each of the following health-care fields on each of the five issues in the columns of the chart. Enter your rating as follows: 3 = high, 2 = medium, 1 = low. (Place a 3 or 2 or 1 in each blank.)

Health-care field	Basis of Rating				
	Economic reward	Legal Authority	Prestige or Status	Importance to Society	Psycho- logical rewards
Podiatrists	_____	_____	_____	_____	_____
Orthopedic Surgeons	_____	_____	_____	_____	_____
Family Practitioners	_____	_____	_____	_____	_____
Psychiatrists	_____	_____	_____	_____	_____
Dentists	_____	_____	_____	_____	_____
Osteopaths	_____	_____	_____	_____	_____
Optometrists	_____	_____	_____	_____	_____
Pharmacists	_____	_____	_____	_____	_____
Chiropractors	_____	_____	_____	_____	_____

THIS ENDS THE QUESTIONNAIRE.

THANK YOU FOR YOUR TIME AND COOPERATION IN ANSWERING

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