INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

UMI

A Bell & Howell Information Company
300 North Zeeb Road, Ann Arbor MI 48106-1346 USA
313/761-4700 800/521-0600

STRUCTURAL INTEGRATION GROUPS IN THE HEALTH CARE INDUSTRY

by

TIMOTHY MARK ROTARIUS, B.B.A., M.B.A.

A DISSERTATION

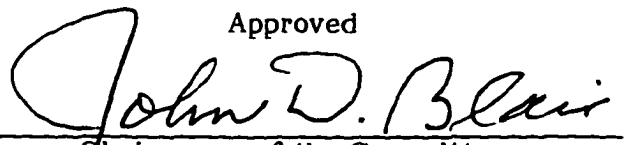
IN

BUSINESS ADMINISTRATION

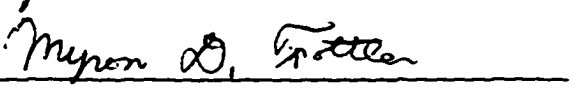
Submitted to the Graduate Faculty
of Texas Tech University in
Partial Fulfillment of
the Requirements for
the Degree of

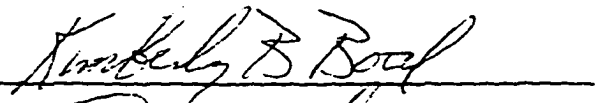
DOCTOR OF PHILOSOPHY

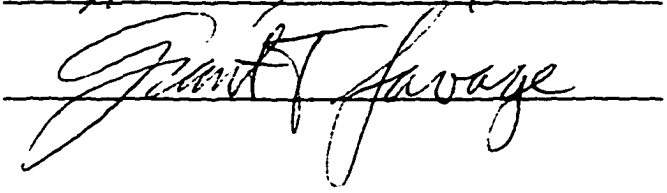
Approved



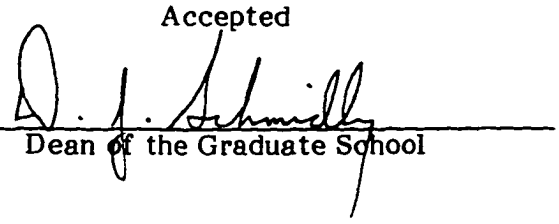
Chairperson of the Committee







Accepted



Dean of the Graduate School

May, 1997

ACKNOWLEDGMENTS

My endeavors in this dissertation were supported by an outstanding dissertation committee—John D. Blair, Ph.D., Grant T. Savage, Ph.D., Myron D. Fottler, Ph.D., and Kimberly B. Boal, Ph.D. They, along with my valued colleague, John A. Buesseler, M.D., continually challenged me so that I was able to reach my goals and fulfill my dreams. I thank them for their guidance, especially John Blair.

I am blessed that my LORD walked with me as I wandered down this path. My mother, Catherine Joy Ratti Rotarius, also deserves special recognition. Although she passed away many years ago, she instilled in me an undying love for knowledge. She taught me the value of learning from others. Thanks, Mom.

In addition, I will never forget the unconditional love and support provided by my most dear friends, Phyllis and Preston Clements. They taught me the values of working hard and taking pride in a job well done.

But, mostly, I wish to thank my wife and friend, Vel Marie (Sanchez) Rotarius. Mere words cannot begin to express my appreciation for her unconditional love and sacrifices during the four years I spent pursuing this dream. I would not have succeeded without her loving support and critical evaluations. I love you, Vel Marie. Thank you for inspiring me. You share in this accomplishment—it is as much yours as it is mine.

TABLE OF CONTENTS

ABSTRACT

This study focused on how structural integration groups (SIGs) affect competitive advantage. SIGs are a form of interorganizational relationships and are defined in this study as structural linkages between one type of organization and other types of organizations in the same industry. These SIGs represent patterns of structural relationships and are based on two dimensions: (1) the number of different partners; and (2) the level of interdependence between the partners. The specific configurations of these two dimensions result in unique SIGs that have specific and identifiable characteristics. Organizational membership in specific SIGs is hypothesized to affect the level of competitive advantage of the organization.

The context specific backdrop for this study is the health care industry. Specifically, this study focuses on the structural linkages between medical groups and four types of health care organizations: (1) other medical groups; (2) hospitals; (3) managed care organizations; and (4) integrated delivery systems/networks. Using clustering techniques, these medical group structural linkages are analyzed to empirically generate SIGs. These SIGs are, in turn, examined using competitive advantage as the criterion to determine the performance effect of SIGs.

The major findings of this study are that: (a) SIGs do exist; (b) SIGs do affect competitive advantage (although in the opposite direction than

expected); and (c) selected environmental and organizational characteristics explain much about SIG creation and they affect organizational competitive advantage to a greater extent than do SIGs.

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION TO THE STUDY

Interorganizational relationships (IORs) are ubiquitous in many industries (Pekar and Allio, 1994), including health care. They have been written about and discussed at great length in the literature (Borys and Jemison, 1989; Oliver, 1990; Buchko, 1994; Ring and Van de Ven, 1994). IORs are seen as relatively lasting interactions that occur between organizations in the same environment (Oliver, 1990).

IORs are a form of organizational boundary spanning (Buchko, 1994) that are often entered into in order to reach outside individual organizations to secure needed resources, which should allow individual organizations to overcome competency limitations (Mitchell and Singh, 1996). They have the potential to become value-adding webs of relationships (Lorenzoni and Baden-Fuller, 1995) through the conversion of general assets into specific assets (Schoemaker and Amit, 1994), which can provide a long term buffer against organizational failure (Zuckerman, Kaluzny, and Ricketts, 1995)

IORs take many forms. They are the hybrids (Borys and Jemison, 1989; Williamson, 1991) between markets and hierarchies (Williamson, 1986, 1991). They include, but are not limited to, informal and formal agreements, joint ventures, mergers and acquisitions, strategic alliances, virtual networks, and boundaryless systems. IORs vary depending on such factors

as the amount of partner autonomy, the level of individual partner identity compared to the IOR's identity, the level of investment and risk acceptance of each partner, the extent to which goals are shared between the partners, etc. IORs allow each partner to do more with less, especially in an era of limited resources (Barney, 1991).

The business environment of today is unpredictable, complex, and chaotic (Halal, 1994). In the health care industry, environmental jolts (Meyer, Brooks, and Goes, 1990) from governmental and market forces are causing hyperturbulence (Shortell, 1994), which is defined as a situation where the rate of change is occurring faster than managers can react to it (O'Connor and Shewchuk, 1995). This hyperturbulence affects the business community much like an earthquake affects a house built on a fault. There are rumblings deep within the environment that result in an onslaught of wave after wave of new uncertainties (Shortell, Gillies, and Devers, 1995). Executives in these high velocity (Eisenhardt and Bourgeois, 1988) environments are often left with a feeling of having no control over the direction of their organizations or of their industry.

One organizational response to this uncertainty is to conduct business using strategic webs of relationships (Blair and Fottler, 1997; Normann and Ramirez, 1993). These networks or patterns of structural linkages can create the flexibility necessary to meet changing environments, while, at the same time, making it possible to focus on specific issues by constraining the range

of possible solutions to problems. In other words, structural linkages allow executives to instill a certain level of stability and control into what would otherwise be a very uncertain world.

An ideal context specific setting in which to observe the creation of these strategic webs is the hyperturbulent environment of the health care industry. While other industries such as micro computer manufacturing also face a hyperturbulent environment, the health care industry is reacting to this high velocity environment by creating a major revolution in the overall financing and delivery of its product.

For example, the emergence in the 1990s of the third generation of managed care (Duncan, Ginter, and Swayne, 1995) has resulted in the rapid changing of payment mechanisms from fee-for-service (i.e., do more for more revenue) to capitation (i.e., do less to make a fixed amount of revenue last longer). Providers face increasing pressure by governments, third-party payers and employer coalitions to reduce costs (Halverson, Kaluzny, and Young, 1995), which often results in a loss of provider autonomy (Blair, Fottler, Paolino, and Rotarius, 1995; Cerne, 1994).

In addition, there are changes in the actual delivery of health care services. Many of the procedures performed in hospitals in the recent past are now being provided through free-standing clinics and/or mobile units (e.g., rehabilitation, dialysis, and diagnostic imaging). Hospital inpatient surgeries decreased from 75% of all surgeries in 1983 to less than half (i.e.,

48%) by 1991 (Wolper, 1995). This has led to a corresponding reduction in inpatient revenue from 82% of hospital revenue in 1985 to a projection of only 50% by the year 2000 (Wolper, 1995).

This revolution in health care delivery and financing is forcing health care organizations to make frame-breaking structural changes *now* regarding how they will conduct business in the years to come (Meyer et al, 1990). These structural changes are occurring even though there is little sound evidence to describe it, understand it, or shape it (Gold, Nelson, Lake, Hurley, and Berenson, 1995).

In this era of increased pressure to integrate and work cooperatively (D'Aunno and Zuckerman, 1987), hospitals, medical groups and health plans are creating networks and systems with varying levels of integration (Gillies, Shortell, Anderson, Mitchell, and Morgan, 1993; Shortell, Gillies, Anderson, Mitchell, and Morgan, 1993; Blair et al., 1995). These new structural linkages are being created to provide the following types of value for both health care organizations and patients (per Coddington, Moore, and Fischer, 1996): improving quality of care; re-emphasizing service (e.g., reducing waiting times, increasing the friendliness of staff, etc.); improving accessibility; reducing unit costs; improving operating efficiency (e.g., reducing unnecessary care, etc.); strengthening customer relationships; and enhancing product offerings. When structural linkages achieve these types

of goals for the partners, the structural linkages have achieved collaborative advantage (Kanter, 1994).

There are many issues involved in the decision to form collaborative relationships. These issues include both process and content issues. For example, prior to actively engaging in collaborative relationships, organizational executives should ask the following types of IOR content questions: what resources or strategic assets does my organization control (Barney, 1991; Schoemaker and Amit, 1994)?; what resources does my organization require from the environment (Pfeffer and Salancik, 1978)?; what are the power relationships between my organization and its stakeholders (Blair and Fottler, 1990)?; what structural relationships does my organization currently have?; does my organization's strategic orientation lend itself to taking risks or to defending my niche (Miles, Snow, Meyer, and Coleman, 1978)?; does my organization have proprietary resources, capabilities, and/or processes (Grant, 1991)?; etc. These kinds of IOR content issues are critically important in order to understand what exactly is needed by the organization. This allows the organization to find the *right* partner.

After IOR content issues are analyzed, there are still two IOR process issues which must be resolved, prior to actually engaging in IORs. They are: (1) given an organization's managerial resources, how many organizational relationships can the organization realistically manage?; and (2) what is the

intensity level of partner integration that is best for the organization? In other words, from an IOR process standpoint, both the number of partners and the level of partner interdependence must be analyzed.

Purpose of this Study

The purpose of this study is to ascertain how these two IOR process dimensions of number of partners and level of partner interdependence combine and what effect this combining action has on organizational performance. In this study, structural linkages are represented by the new conceptual construct of structural integration groups (SIGs).

SIGs represent the different patterns or interactions of the two IOR process dimensions of number of partners and level of partner interdependence. Potential partners of an organization include other intra-industry organizations. Partner interdependence level indicates the intensity of the relationships between the partners.

This study uses the context specificity of the health care industry. The focal organizations studied are U.S. medical groups. These medical groups are increasing in importance in today's health care environment as both cost containment and quality improvement play larger roles in the efficient and effective delivery of health care.

The structural linkages these medical groups are involved in are important to analyze and describe so that an overall picture of health care

delivery can be developed. The performance implications of the different types of structural linkages are of paramount importance if the U.S. health care industry is to simultaneously achieve its two top priorities of cost control and quality enhancement.

The Research Questions

This study explores four research questions, all relating to this new concept of SIGs. The first research question asks: Do SIGs exist and, if so, what do they look like? In other words, do the two independent dimensions of number of partners and level of partner interdependence combine into discernible patterns of SIGs? The second research question to be examined is: What predicts the existence of SIGs? For example, are there environmental and/or organizational characteristics which predict an organization's membership in specific SIGs?

The third research question asks: Does membership in SIGs lead to organizational competitive advantage? The fourth research question examines: Are there environmental and/or organizational characteristics which predict an organizations competitive advantage?

All of these four research questions will be examined from the context specificity of the health care industry, specifically the medical group segment of health care.

Significance of this Study

This study illustrates a way to examine the context specific relationship between IORs and performance using a context specific approach (Blair and Hunt, 1986). Specifically, it provides insight into the argument that health care organizations enter into IORs in order to positively position themselves vis-à-vis their competitors (i.e., to gain a competitive advantage; Shortell and Zajac, 1990).

The changes underway in the delivery and financing of health care in the U.S. are making IORs (i.e., structural linkages) an attractive strategy for many health care organizations. This high rate of IOR activity in the U.S. health care industry makes this specific industry an ideal one in which to pursue the potential relationships between structural linkages and organizational performance.

The focal organizations of this study are medical groups, an important and significant segment of the health care industry. For various reasons (e.g., high visibility within the local community, very formal hierarchical form, etc.), hospitals have traditionally been the focal organizations of much of the past health care research. By using medical groups instead hospitals, the base of health care research is thereby expanded from mostly hospitals to include the other major organizational health care delivery structural form, medical groups.

Environmental change forces organizations to create new strategic responses. These novel organizational responses are affecting the way organizations measure organizational effectiveness. In other words, the traditional ways of evaluating businesses (such as growth) are no longer complete in this hyperturbulent environment. In addition to the fundamental effectiveness criteria of profits and survival, firms must now be responsive to many key stakeholders, who either did not matter as much several years ago or were competitors until rather recently. The new effectiveness criteria include continuous quality improvement of products and services and an expanded definition of service orientation and cost effectiveness, as well as the traditional criteria of market share, profitability, and organizational survival.

The actual linking of IORs and competitive advantage fills a gap in the empirical research performed to date. While it is often posited that IORs will lead to better performance because of such things as a reduction in uncertainty, access to new markets, etc., the empirical research to date has not fully explored the direct relationship between structural linkages and competitive advantage.

Organization of Succeeding Chapters

The remainder of this dissertation is organized as follows. Chapter II provides a theoretical and empirical review of the literature that is relevant

to the support of the research questions and the propositions of this study. Chapter III provides a detailed discussion of the research methodology, including data source, model and construct definitions, operationalization of the constructs, and the analysis plan.

Chapter IV presents the results of the empirical analyses, including construct measurement issues, and findings and interpretations of the propositions. Finally, Chapter V discusses the contributions, limitations, and future directions of this study.

CHAPTER II

LITERATURE REVIEW

Chapter Overview

This chapter begins with a presentation of the literature review, which covered the time period from the late 1980s to the present. Appendix A indicates the journals that were searched. The results of the literature search are presented using the major topics of: (a) overview of context free interorganizational relationships (IORs), along with an overview of the context specificity of the health care industry; (b) IORs and hybrid arrangements; (c) structural linkages involving medical groups; and (c) competitive advantage. Tables showing the relevant theoretical articles and empirical studies are included.

Next, this chapter presents a discussion of the gaps in the context free and context specific literatures. Finally, a theoretical discussion of structural integration groups (SIGs) is presented, which leads to a discussion of the specific propositions tested in this study.

Overview of Interorganizational Relationships and Health Care

Albert Einstein (per Reinertsen, 1995) is credited with making the following point about research: *The significant problems we currently face*

cannot be solved at the same level of thinking we were at when we created them. This profound view of the conceptualization of research is readily apparent in strategic studies. For example, ten years ago, strategy was viewed as something that allowed the firm to position itself in the right place within the value chain (Porter, 1985). Today's view of strategy is that organizational strategy must now set the stage for the firm to reinvent the firm's value within the entire value constellation of a web of relationships (Normann and Ramirez, 1993). In order to manage this value constellation, firms must understand the roles, relationships, and operational practices of each individual entity in the constellation.

The goal of the constellation is to get to the future first (Hamel and Prahalad, 1994). In order to get to the future first, business executives must either see opportunities not seen by others or be able to exploit opportunities, by virtue of consistent capability building (Barney, 1995). The ability to renew capabilities has taken on a more urgent focus as the environmental landscape becomes more egalitarian regarding the ease of and fast access to information. This future oriented look is especially important to the U.S. health care system.

The health care industry is in a constant state of change (Coddington, Moore, and Fischer, 1994; Blair et al., 1995). It is changing on almost all fronts. For example, the health care industry has been characterized as

moving from a hospital centered system focusing on episodic care and institutional planning, to one that is system centered with an emphasis on the total health of patients through a seamless delivery system, which uses market based planning (Coddington et al., 1996).

As the United States health care industry moves toward its future, it is constantly reminded of the three major health care goals: cost, quality, and access. Arguably, the U.S. health care industry possesses the highest quality acute health care of any country. While there may be isolated examples of poor technical quality in the U.S. in some areas of long term care, rehabilitative services, etc., the overall U.S. picture of health care quality is one of top notch, state-of-the-art acute care.

However, cost and access continue to be problems that plague the U.S. health care system. Cost of health care in the U.S. is approaching 15% of gross national product (GNP) or $1 trillion dollars per year (Shortell et al., 1995). While it appears that costs have continued to rise despite the best efforts of the health care system to place restrictions and constraints on payments to providers, there is some evidence that managed care may be resulting in a leveling of costs (State Health Watch, 1996).

Access is also a major problem in the U.S. There are between 15 million and 50 million uninsured and uninsurable people in the United States (Hellander, Moloo, Himmelstein, Woolhander, and Wolfe, 1995; Newacheck, Hughes, and Cisternas, 1995; Rowland, Lyons, Salganicoff, and Long, 1994; Weil, 1994). The uninsured are simply those without adequate health insurance. However, the uninsurable are often the very

sickest of the population. It has been calculated that the cost to treat uninsurable patients is more than three times the sum spent on all the insured plus all the uninsured, yet insurable, patients (Weil, 1994).

While governmental initiatives often indicate that change is expected (i.e., the government acts a proxy for the general public), market forces generally take the lead and try to control the type and speed of change. Currently, the structures of health care delivery and financing in the United States are in the throes of government initiated, market directed change. This movement of the health care industry to a managed care system via integrated delivery systems is forcing health care providers to reexamine where they can best add value within the total health care value constellation in order to gain competitive advantage over other providers.

The major focus of this structural change is collaboration. This focus on collaborative efforts by provider and financing organizations assumes that the conflicting demands of cost containment of health care delivery, improved health care quality, and better access to health care services can be met through various collaboration efforts. These collaborative activities are intended to allow organizations to meet these demands, which should affect competitive advantage of the organization.

Interorganizational Relationships and Hybrid Arrangements

Organizations are in an all time high number of IORs (Pekar and Allio, 1994). These range from informal purchasing and negotiating

cooperatives to complete vertical integration (i.e., fully integrated delivery systems in health care). This collaborative environment is ubiquitous and is a very different environment than the one facing organizations in many industries just a decade ago. Thus, IORs (i.e., structural linkages) of an organization can be seen as resources that leaders of organizations can use to attain competitive advantage.

Structural linkages, as used in this study, are better known in the organizational theory literature as IORs. Structural linkages take many forms. They are the hybrids (Borys and Jemison, 1989; Williamson, 1991) between markets and hierarchies (Williamson, 1986, 1991). They include, but are not limited to, informal arrangements, formal agreements, joint ventures, and acquisitions. They go by many different names, such as vertical integration, strategic alliances, mergers, consortia, federations, networks, virtual organizations, etc. depending on the level of interdependence present in the specific structural linkage.

Structural linkages are very prevalent in today's business world, which is described as unpredictable, complex, and chaotic (Halal, 1994). This, according to Halal (1994), leads to the world conducting business using webs of relationships between organizations. These webs or networks or patterns of structural linkages allow executives to build in some stability and comfort into the ubiquitous uncertainty present in their world.

Each type of structural linkage represents differing amounts of interdependence (i.e., autonomy, investment, risk for the partner organizations, etc.). In addition, all structural linkages involve the concept of collaboration. Collaboration is defined in this study as: voluntary work conducted by two or more organizations for the purpose of achieving common goals within known or unknown time constraints, and to allow each partner to maintain its own individual identity and self interest.

Collaboration is entered into by partners in order to allow each partner to do more with less, especially in this era of limited resources (Bergquist, Betwee, and Meuel, 1995). This allows each organization to be more responsive and flexible in this age of often intense and turbulent changes in the environment. When collaboration achieves these types of goals for the partners, it is said that the structural linkages have achieved collaborative advantage (Kanter, 1994).

Successful organizations (i.e., those with competitive advantage) must attract resources of all kinds. One way to gain access to resources is to form IORs to draw in capital, suppliers, customers, etc. IORs have been heavily discussed in the literature (Borys and Jemison, 1989; Lorange and Roos, 1992; Oliver, 1990, 1991; Buchko, 1994; Ring and Van de Ven, 1994). IORs are relatively lasting interactions that occur among and between an organization and other organizations in its environment (Oliver, 1991). Alliances allow the pooling of resources (Kanter, 1989) and the sharing of

risk in confronting the harsh realities of today's business arena of complexity, uncertainty, and change. Alliances arise out of mutual (i.e., win-win) needs (Zuckerman et al., 1995).

IORs are any relationship involving two or more organizations. IORs fall on a continuum ranging from informal to highly structured (this continuum will be discussed in the next section). The key component of all IORs is that two or more organizations *decide to cooperate* with each other to achieve an objective faster and/or more efficiently than would be possible by any one firm on its own. Essentially, IORs represent a form of boundary spanning for each partner organization (Buchko, 1994).

Organizations make the decision to cooperate with each other because, in today's rapidly changing environment, the new challenges confronting firms cannot be met with the repertoire of existing organizational forms (Kaluzny and Zuckerman, 1992). All cooperative ventures must have as a goal that each member must benefit from the cooperation, or the members would have no reason to collaborate (Zuckerman and D'Aunno, 1990). Value adding partnerships are required as organizations seek to find ways to exist without necessarily adding internal capacity (Kanter, 1989). The pace of IOR formation has increased dramatically in the last fifteen years. There were about 5,000 IORs in the period from 1980-1987. However, from 1988-1992, a

time frame about half as long as the earlier period, there were over 20,000 IORs formed! (Pekar and Allio, 1994).

Benefits and Costs of IORs

Oliver (1991) has identified several specific reasons or benefits for entering into IORs. These include: necessity (e.g., to overcome regulatory barriers); opportunism/asymmetry (i.e., desire to control or have access to another organization's resources such as distribution systems, technology, etc.); increase stability/predictability (i.e., reduce risk and manage uncertainty); institutional legitimacy (i.e., to appear to be at prevailing norms); efficiency (i.e., synergistic combinations of resources); and reciprocity (i.e., to work toward goals shared with other organizations). In addition, IORs often provide the opportunity to invest in ideas that would be prohibitively expensive or risky for one firm to attempt (Buchko, 1994).

IORs also have costs or risks associated with partnering. These costs can include such risks as sharing of proprietary technology and other secrets, allowing competitors access to your competitive plans, becoming a captive suppler to the IOR (i.e., over time, the IOR becomes the firm's only customer), and a redistribution of power and dependency relationships (Buchko, 1994).

IORs have several key factors that must be understood for the arrangement to succeed (Borys and Jemison, 1989). For example, some of the key issues include: there must be a common purpose between the partner

organizations, which reconciles the differing goals of each partner; the boundaries of where partner firms end and the hybrid begins must be determined; and the IOR must create value, thereby improving the competitive advantage of each partner.

IORs can buffer an organization from failure (Miner, Amburgey, and Stearns, 1990). However, only strategic IORs can be long-term buffers (Zuckerman et al., 1995). IORs that have a strictly operational perspective will not provide long term organizational buffering. The key to utilizing IORs and recognizing all the attendant benefits while reducing organizational risk is to know which alliances will be valuable in the future (Hamel and Prahalad, 1994). In other words, what new structural competencies are required for firms to be successful in the uncertain future?

Cooperation and/or Competition

One very important issue brought to the forefront when discussing IORs involves the debate about cooperation versus competition. Although IORs do involve a certain amount of cooperative behavior, the ideas of competition and competitive advantage are still very much alive and well. For example, both cooperation and competition can exist between the subsidiaries of a parent corporation (Hoskisson, Hill, and Kim, 1993) and between health care partners (Greenhalgh, 1995).

In these types of situations, cooperation between the subsidiaries or components is required to coordinate the actions of otherwise independent organizations, so that the collaborative advantage (Kanter, 1994) of network-type organizations can be realized (i.e., so that skills can be transferred, resources can be shared, complimentary investments can be made, etc.). This cooperation or collaboration is viewed as: (1) a way for organizations to overcome competency limitations (Mitchell and Singh, 1996); and (2) an avenue through which subsidiaries or component organizations can work toward the common goals of the parent or integrated delivery system. Thus, all IORs are based on cooperative relationships that facilitate the exchange of resources across organizational boundaries through the coordination of activities and sharing of benefits (Browning, Beyer, and Shetler, 1995).

However, competition is also present between the subsidiaries or components. This competition is for the scarce resources of the parent or the integrated delivery system. Competition for these scarce resources is necessary in order to ensure that the managers of the subsidiaries and components can be held accountable for performance. Therefore, while IORs and cooperation are popular terms to use today, they have not eliminated the concept of competition between cooperating organizations.

In addition, even with all the expected cooperation between subsidiaries (or components), the IOR, itself, must compete with other organizational forms in its market area. For example, an integrated health

care delivery system (IDS) attempts to meet the health care needs of its member patients. To do so, the IDS stresses cooperation (i.e., trust and a cooperative negotiating framework, per Sheppard, 1995) between its component entities. However, the IDS and its component entities are still competing with other IDSs, medical groups, and hospitals using the competitive advantage perspective. In effect, the IDS is practicing the new paradigm of competition wherein the individual entities change from competing as a single entity to competing as a coalition of entities (Hamel and Prahalad, 1994).

One final note about cooperation versus competition: by cooperating, organizations may be distracted from the primary driving pressure of all economic exchanges in our society—competition. The main strategic goal of all organizations is to create and maintain competitive advantage. An organization will not be as successful at achieving competitive advantage if it must subordinate its goals for the good of the parent.

IOR Continuum: Markets to Hybrids to Hierarchies

IORs take many distinct forms. They are alternatively referred to as alliances, informal agreements, mergers, cooperative ventures, networks, horizontal integration, joint ventures, vertical integration, etc. How can we make sense of all these different terms? What distinguishes one type of IOR from another?

Transaction cost theory can be one categorization framework for understanding IORs. Transaction cost theory uses the concept of "efficient exchanges" to develop a continuum from markets to hierarchies (Williamson, 1986). Table 2.1 illustrates the differences between markets and hierarchies using three criteria: (1) the type and length of the exchange; (2) the level of asset specific investment necessary; and (3) the manner in which conflicts are resolved.

For example, markets are the most efficient means of exchange when there are single exchanges of short duration with virtually no asset specific investments, and when the relationship between the parties is governed by legal threat (i.e., contract breaches are enforced or remedied by courts). Hierarchies, on the other hand, are deemed the most efficient exchange mechanisms when there are continuous exchanges of indefinite duration using highly asset specific investments, and where the relationship between the parties is governed by the use of rules and procedures (i.e., accepted norms of one business).

Using this transaction cost framework, any exchange mechanism between markets and hierarchies is assumed to be carried out using hybrid organizational forms (Borys and Jemison, 1989; Williamson, 1991). These hybrids represent the different types of IORs. Figure 2.1 illustrates this type of market-hybrid-hierarchy continuum, with specific types of IORs shown within the hybrid category.

Table 2.1

Markets versus Hierarchies

Criteria	Market Transactions	Hierarchical Transactions
1. Exchange Type and Length	Single exchanges of short duration.	Continuous exchanges of indefinite duration.
2. Asset-Specificity	None.	Very high.
3. Conflict Resolution Method	Legal threat.	Rules/procedures/norms.

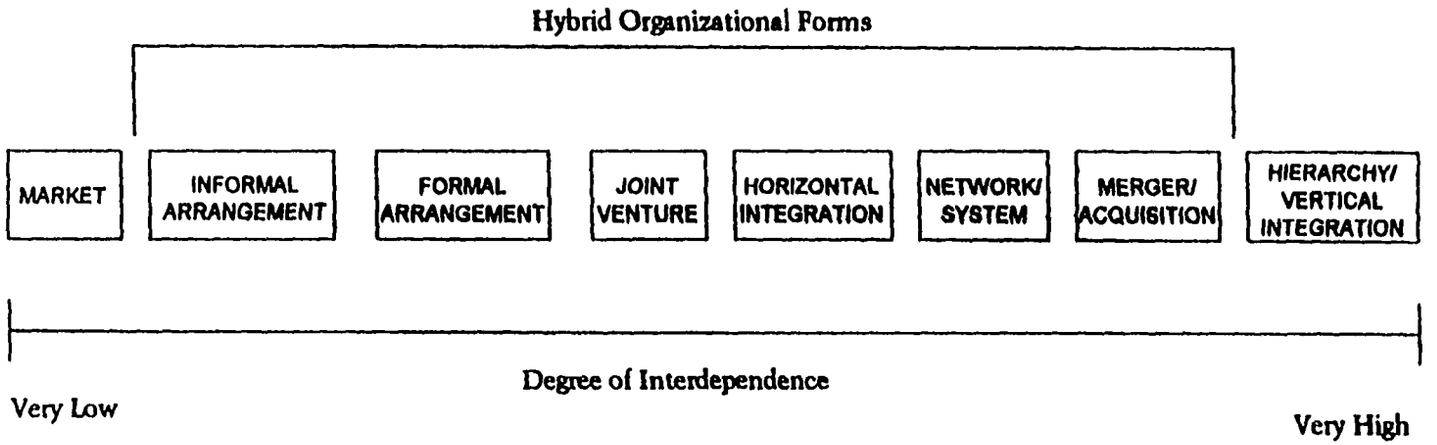


Figure 2.1: Interorganizational Relationships—Between Markets And Hierarchies.

Regarding the choice of names for the different types of IORs shown in this figure, other researchers have used different names for the distinct categories within hybrids. For example, hybrids have been subdivided into recurrent and relational transactions (Ring and Van de Ven, 1992) and into coopting, coalescing, quasi-firm, and ownership categories (Longest, 1990). Still other classification schemes for hybrids include much more detail such as subdividing formal arrangements into simple and complex contracts. However, all of these differing ways to subdivide hybrids use essentially the same types of criteria as used in this study and described next.

When analyzing IORs, a natural dimension to use for ordering the different types of organizational relationships is degree of interdependence. A good measure of interdependence automatically takes into account the three criteria used above to separate markets from hierarchies (i.e., exchange type and length, asset specificity, and conflict resolution method). As shown on Figure 2.1, the degree of interdependence increases from left to right (i.e., as you go from market to hierarchy). For example, informal arrangements represent a relatively low level of integration between organizations. However, networks and systems, which are also known as boundaryless organizations (Devanna and Tichy, 1990) and virtual organizations, require considerably more integration and, hence, interdependence between the partners than many of the other types of hybrids. A brief discussion of each of the distinct types of relationships shown on Figure 2.1 follows.

Markets. As described earlier, this is the situation where all entities doing business together operate as separate and distinct entities. Each party has complete autonomy and relies on other organizations only for commodity-type resources. Typical arrangements would be multiple suppliers vying to sell to multiple buyers. None of the buyers nor the sellers has any particular allegiance or interdependence to any of the other buyers or sellers.

Informal Arrangements. These types of relationships between organizations involve some small level of allegiance between the parties. An example of an informal arrangement would be the traditional referral patterns that have existed among physicians for many years. In the past, the entire health care industry operated as a fragmented delivery system because of its reliance on these types of informal arrangements. In fact, the prevalence of informal relationships in the health care industry led to the characterization of health care as being delivered in a "non-system."

Formal Arrangements. These relationships involve considerable more structure and formality than the other types already discussed. Typically, a contract or other document is drawn up that specifies the obligations of each party. An example of a formal arrangement is a license agreement. This involves the purchase by one firm of the right to use an asset of another firm.

Joint Ventures. These arrangements imply the creation of a new organization by two or more partners. Depending on the level of involvement of each of the new partners, the partners can be either equal or non-equal

partners. These are generally set up for an express purpose that should benefit all parties while reducing the risk to each individual entity. In health care, joint ventures have been analyzed using the two dimensions of potential for financial success and potential for relationship success (Blair, Slaton, and Savage, 1990).

Horizontal Integration. Horizontal integration implies somewhat more integration effort than the relationships discussed thus far because these arrangements are often between multi-point competitors. In a recent survey, 48% of hospital chief executive officers said they believe their hospitals would merge with or acquire another hospital (Cerne, 1993). This particular hybrid arrangement has been analyzed from a rural hospital-urban hospital setting using the two dimensions of potential for conflict over control of the rural hospital, and the potential for matching resources of the urban hospital with the needs and requirements of the rural hospital (Savage, Blair, Benson, and Hale, 1992).

Networks/Systems. Network/system organizations go by several other names including boundaryless organizations, virtual organizations, 21st century organizations, etc. Networks allow for the collective assets of many firms to enjoy synergistic relationships (Shortell and Reinhardt, 1992; Hinterhuber and Levin, 1994). Typically, these organizational forms are loosely coupled and have semi-permeable boundaries. This allows for the easy flow of information between the entities making up the network/system.

It also implies much more relationship intensity (i.e., a high level of interdependence between partners).

The focus of a network/system is on core processes of the network/system, not each individual entity's core processes. It has been suggested that the urgency with which the health care industry has embraced networks/systems is due to the ability of these organizational forms to deliver more value to more people than the health care delivery approach currently in use (Shortell and Reinhardt, 1992).

Mergers/Acquisitions. Mergers are the unification of multiple entities into one entirely new organization. Acquisitions occur when one firm completely purchases another firm. There is a huge literature base regarding mergers and acquisitions. These types of integration efforts have their roots in the growth and diversification periods of strategic management. Mergers and acquisitions can result in complete vertical integration. However, they do not necessarily lead to that. Within health care, an organization that illustrates the merger/acquisition approach is Columbia.

Hierarchy/Vertical Integration. Complete vertical integration occurs when the entire linkage of suppliers, producers, and customers comes under one hierarchical authority. Operational benefits of vertical integration can include a reduction of costs due to the elimination of duplicate processes and overhead. It can also lead to improved coordination of activities and functions. Competitive benefits may include the gaining of access to

important resources and the creating of synergies from the bundling of resources.

Backward integration, a subset of vertical integration, has been researched in health care using hospital sponsorship of ambulatory care centers (Bigelow and Arndt, 1991). For vertical integration in health care to be considered effective, it must provide (per Cave 95): operational stability (i.e., one governance structure that has strong physician bonds to the system); a strong physician primary care base; efficient delivery of health care services through such activities as: (1) rigorous credentialing to select physicians; (2) retention of efficient physicians; and (3) maintenance of the optimal primary care/specialist staffing ratio; and expansion of the covered system to ensure geographic access to physicians.

The discussion now turns to the specific IORs and hybrid arrangements in the health care field that involve medical groups. In the remainder of this literature review, the term structural linkages will be used to refer to IORs and hybrids. This is to reinforce the concept of structural linkages so it can be seen as an appropriate independent variable for this study.

Structural Linkages Involving Medical Groups

The health care industry is an ideal setting to observe how structural linkages affect competitive advantage. Competitive advantage is

increasingly important to health care organizations because the industry is in the midst of a major revolution, with the health care environment experiencing a state of hyperturbulence. The changes underway in the delivery and financing of health care in the U.S. are making IORs (i.e., structural linkages) an attractive strategy for many health care organizations. The presence of managed care in many markets is pressuring health care organizations to control costs and assume greater financial risk for the health outcomes resulting from their services (Halverson et al., 1995).

For example, payment mechanisms have been rapidly changing from "do more for more revenue" to "do less to make a fixed amount of revenue last longer." Providers face greater scrutiny by payers, employer coalitions, and the public, resulting in a loss of autonomy (Blair et al., 1995; Cerne, 1994). For example, the public is better informed and there seems to be a more active and diversified group of health care purchasers, which is leading to changes in the delivery of health care services. In addition, employers, whose health benefit costs increased 60% between 1987-1990 (Shouldice, 1991), payors, and the government continually call for reform as increases in health care expenditures continue to rise. This is causing a push to curtail these rising health care costs (Halverson et al., 1995), which have historically outpaced inflation, sometimes by as much as a factor of two (Shortell and Reinhardt, 1992). These cost control efforts may be working. Managed care appears to be leveling health care costs (State Health Watch, 1996)

This market based health care reform is one of the most complex domestic issues facing the U.S. (O'Donovan, 1994). This major health care revolution is forcing health care organizations to make frame breaking changes in how they will conduct business in the years to come (Meyer et al., 1990).

This study analyzes the partners of medical groups. Four potential partners of medical groups have been identified for analysis: (1) other medical groups; (2) hospitals; (3) managed care organizations; and (4) integrated delivery systems/networks. The organizational forms of each of these partners are discussed next.

Organizational Forms of Medical Group Partners

The four potential partners of medical groups can organize into any of several different types of organizational forms. Examples of these different types are shown on Table 2.2 and described next.

Medical Groups. These organizations can be classified many different ways. For example, they be categorized as solo practices or medical groups. Solo practices, as defined by the professional association of medical group executives, the Medical Group Management Association (Englewood, Colorado), are those organizations in which either one or two physicians operate as a single entity. Medical groups, therefore, are defined as medical provider entities with three or more physicians.

Table 2.2

Health Care Organizational Forms

Selected Categorizations of:	Organizational Forms
Medical Groups	Solo or Group? Single-Specialty or Multispecialty? Primary Care or Specialist? Academic Practice Plan?
Hospitals	General or Specialty? Urban or Rural? Profit or Not-For-Profit? Independent or System Member?
Managed Care Organizations	Preferred Provider Organizations/ Arrangements Health Maintenance Organizations • Staff Model • Group Model • IPA Model
Integrated Delivery Systems/ Networks	Loosely Integrated Networks Fully Integrated Systems

Medical groups can also be categorized as either single specialty or multispecialty. Or, the designation can be primary care as opposed to specialist. Primary care typically includes general practice, family medicine, internal medicine, pediatrics, and, possibly, obstetrics/ gynecology. Specialist designations refer to other specialties like cardiology and orthopedics. In addition, medical groups are often divided between academic practice plans, which provide the teaching function for medical schools, and non-academic practice plans. There are many other ways to subdivide medical groups. This discussion was presented only as an illustrative example.

Hospitals. Selected categorizations of hospitals include whether the hospital is considered a general or specialty hospital (i.e., psychiatric) or whether it is urban or rural. In addition, a popular classification system is the tax status of the hospital—for profit or not-for-profit. Most county and religious hospitals are not-for-profit. An interesting point about not-for-profit hospitals is that they can contain internal entities that are considered for profit divisions (e.g., departments that sell management services to other entities). Hospitals can also belong to systems or be considered independent. This affects the level of autonomy the hospital has when performing such functions as negotiating with managed care organizations and strategic planning.

Managed Care Organizations (MCOs). These organizations represent the financing portion of health care delivery. They can be classified in

different ways. For example, MCOs can be of the closed or open variety. Open MCOs allow any physician who meets the MCOs specific credentialing criteria to treat patients and receive compensation from the MCO. Closed MCOs only allow those physicians who are specifically contracted with or who are employees to treat patients and receive compensation from the MCO.

For purposes of this study, MCOs will be classified into two broad categories (per Shouldice, 1991): (1) preferred provider organizations (PPOs) or arrangements (PPAs); and (2) health maintenance organizations (HMOs). PPOs rarely resemble traditional organizations in the conventional sense. Rather than being hierarchical organizational forms, they are generally brokered arrangements between providers and purchasers of health care services. Thus, the term PPA. Basically, in PPOs and PPAs, a select, limited panel of providers contracts at a discount to provide health care services to a members of the PPO/PPA. It has been suggested that PPOs/PPAs may only be transitional arrangements, which will continue to evolve into full-blown HMOs. However, many PPOs/PPAs still exist today, and it has been demonstrated that MCOs do not change organizational structure very willingly (Wholey and Burns, 1993).

HMOs are legal entities with boards of directors. There are three basic HMO forms as defined by the U.S. government (Shouldice, 1991): the staff model; the group model; and the IPA model. These forms differ on several criteria, two of which will be discussed for each of the three HMO types

presented here: (1) the method used to pay physicians; and (2) the method used to provide services. Actual HMOs may adopt slightly different methods to conduct business or may combine features from each of these three models. These "network" and "hybrid" models are beyond the scope of this study. For illustrative purposes, a discussion of the first three HMO models will be adequate.

The staff model HMO employs the majority of physicians it uses. Some specialist medical fields for which there is not enough demand by the HMO members may not be hired as employees, but may, instead, be on contract. But, for the most part, physicians are employees of the HMO (i.e., "W-2 physicians"), which leads this type of HMO being of the closed panel type of MCO. In addition, staff model HMOs typically own the facilities through which services are provided. This results in the "clinic" atmosphere of staff HMOs.

The group model HMO is an entity that contracts with groups of physicians to provide services to the members of the HMO. This type of HMO may be a closed or open panel MCO. The medical groups under contract with the HMO are independent entities from the HMO. The physicians are often referred to as "1099 physicians," as opposed to being "W-2 physicians" as discussed above. They are paid for their medical services from the HMO at either discounted fees or on a capitated basis for services provided in the facilities of the specific medical groups. Discounted fees are

usually agreed to by medical groups because of the promise of increased patient volumes.

The IPA (independent practice association) model HMO is similar to the group model except that it is an open panel MCO model, and the majority of payments made from the HMO to medical groups is in the form of capitation. Capitated fees are fixed amounts of revenue paid to medical groups for the treatment of patients in the HMO. With capitated revenue, the medical group shares in the financial risk associated with treating patients, which was traditionally assumed by the third party insurer.

The introduction of MCOs has been shown to have a dramatic effect on the length of stay for inpatient admissions (Shortell et al., 1995). During the first generation of MCOs (i.e., the 1970s, per Duncan et al., 1995), hospital inpatient days ratio was 450 inpatient days per each 1,000 members. This figure dropped to 300/1,000 by the second generation (i.e., the 1980s, per Duncan et al., 1995) and fell to 175 inpatient days per 1,000 MCO members by today's third generation (i.e., the 1990s, per Duncan et al., 1995). This illustrates the potential cost effectiveness of MCOs.

Integrated Delivery Systems/Networks (IDS/Ns). Integrated delivery systems/networks combine clinical treatment (i.e., medical groups and hospitals) with the financing function (i.e., MCOs) in order to provide the complete spectrum of medical care for a defined population in a specific geographic area and to share clinical and fiscal accountability (Shortell,

Gillies, and Anderson, 1994) for the outcomes and health status of that population. In an IDS/N, the three component organizations (i.e., medical groups, hospitals, and MCOs) are kept in balance by common management and financial incentives to match medical resources with the needs of patients and payers (Coddington et al., 1996). These organizations are also referred to as organized delivery systems (ODS, per Shortell et al., 1993).

Two different levels of IDS/Ns are discussed in this study: (1) loosely integrated networks; and (2) fully integrated systems. The differences between these two organizations include the level of commitment by the key component organizations (i.e., medical groups, hospitals, and MCOs), and the level of governance provided by the IDS/N to the component organizations.

Summary. Given that there are four distinct potential partners, the following questions come quickly to mind: individually, which of the four potential medical group partners has the greatest effect on competitive advantage? Collectively, what constellation of medical group partners has the greatest affect on competitive advantage? These general questions will be addressed when the propositions are discussed later in this chapter.

Integration of Health Care

It has been suggested that the unrelenting and somewhat conflicting demands of cost containment, improved quality, and better access are impossible to meet for the traditional, autonomous health care organization

(Kaluzny and Zuckerman, 1992). This is forcing health care organizations to seek alliances with other health care organizations, in order to secure the necessary resources to meet these demands.

The types of relationships between medical groups and potential partners can range on a relationship interdependence continuum that has cooperation and integration at the ends and collaboration in the middle (Coile, 1994). Cooperation includes the less intense relationships such as shared office space and referral patterns. Collaboration includes the medium level of relationship interdependence, including formal arrangements and joint ventures entered into for purposes such as the purchase of high technology equipment, and to present a unified front when negotiating with managed care organizations. The detail available in the data for this study allows for the use of four levels of interdependence, as opposed to Coile's three basic levels.

Integration, as defined by Coile's (1994) relationship intensity continuum, represents the higher level of relationship interdependence between health care organizations, and includes acquisitions of other health care organizations and the formation of integrated delivery systems/ networks. In a survey of 1,143 hospitals and the corporate offices of 41 systems (per Cerne, 1993), respondents were asked about these higher level of intensity relationships among hospitals. Twenty six percent of respondents indicated that their hospital planned on merging with another

hospital, while another 22% felt their hospital would acquire another hospital. In addition, 3% of respondents believed their hospital would be acquired by another hospital.

Overall, the survey (as reported by Cerne, 1993), suggested that over half of the hospitals would be involved at a very intense integration level with other hospitals. However, instead of rushing into the integration arena without a plan, Coddington et al. (1994) suggested that the choosing of integration partners should be for the following specific purposes: (a) choose medical groups as partners based on their ability to attract and retain new primary care physicians; (b) choose hospitals as partners based on their ability to lower overhead and other administrative costs; and (c) choose managed care organizations as partners based on their ability to provide state-of-the-art management information systems.

The discussion now turns to the different types of relationships between medical groups and their four potential partners. These relationship types are shown in Table 2.3 and described next.

Medical Groups and Other Medical Groups

Ever since physicians divided themselves into separate specialties, they have had to develop relationships with other physicians. This study suggests that there are four generic relationships that have varying levels of

Table 2.3

Structural Linkages of Medical Groups

Partner	Types of Structural Linkages
Other Medical Groups	Informal Arrangements Formal Arrangements Joint Ventures Acquisitions
Hospitals	Informal Arrangements Formal Arrangements Joint Ventures Acquisitions
Managed Care Organizations	Third-Party Contracts Risk Sharing Contracts Acquisitions
Integrated Delivery Systems/Networks	Fully Integrated Systems Loosely Integrated Networks

relationship interdependence with the specific partner: informal arrangements; formal arrangements; joint ventures; and acquisitions.

Informal Arrangements. Many years ago, when physicians operated mostly in solo practices, these low intensity relationships represented the manner in which most physicians were involved with each other. As the health care industry has evolved, there are few solo practices left. However, physicians and medical groups are still involved in these informal arrangements, even though each party has no real ties to the other and may quickly drop one informal relationship for another as new opportunities present themselves.

For example, even though most physicians are in medical groups, if they are not in large, comprehensive care multispecialty groups, referrals among physicians must still take place. Also, in those local health care markets where managed care does not yet have a strong presence, informal referrals among physicians are still commonplace.

Formal Arrangements. Medical groups participate in these more intense types of relationships for several reasons, including to find solutions to administrative and negotiation problems. For example, medical groups can form a group practice without walls (GPWWs) to deal with administrative problems. They can also form an independent practice association (IPA) to present a unified negotiation strategy to managed care organizations. These two specific types of formal alliance are discussed next.

GPWWs are entered into for purposes of sharing centralized expenses (Cave, 1995). The goal of this type of arrangement is to reduce administrative and operating costs. This alliance is usually a professional corporation whose sole purpose is to provide specific management, purchasing, and financial services for a network of individual practices. The individual medical groups maintain complete control of their own organizations and have representation on the alliance board.

IPAs are formal legal entities that contract with managed care organizations on behalf on the medical groups members (Shouldice, 1991). The member medical groups typically engage the IPA to submit claims to the managed care organizations and to pay the medical groups out of the collections. Various specific details of payment schemes from the IPA to the medical groups can be arranged. Each medical group partner retains its own autonomy.

These are only two examples of formal strategic alliances among physicians. However, they are representative of the types of formal relationships occurring in today's collaborative health care environment. While there is some level of formality with these relationships, there is usually little real monetary cost to either part for ending these types of relationships prior to the expiration date of the alliance (if one exists).

Joint Ventures. Medical groups often partner with other medical groups to build common medical facilities, such as surgi-centers or a large

medical care complex. For example, a primary care group may partner with a multispecialty group or several single specialty, non-primary care groups in order for their patients to be able to receive the most comprehensive outpatient care at one site.

These formal relationships involve a financial commitment that is typically considerably larger than with the first two types of relationships. This relatively large monetary investment increases the commitment of all medical group partners, which provides a level of endurance to the venture and may increase the level of interdependence of the relationship. Medical group partners involved in these types of joint ventures have entered into them with a rather long term perspective, and will usually attempt to work through problems between the different groups rather than just walk away from the deal.

Acquisitions. These relationships between medical groups involve ownership, which translates directly into a control issue. For any acquisition, there is an acquiring medical group and an acquired medical group. This study assumes a particular medical group views the intensity of these two relationships differently depending on whether the medical group is the acquirer or the acquired.

For example, when Medical Group A acquires Medical Group B, there is an inherent high level of intensity (i.e., interdependency between A and B and dependency by A) that goes with the relationship. However, when

Medical Group A is acquired by Medical Group B, there is assumed to be an even higher level of intensity for the acquired medical group (i.e., for Medical Group A). This difference in intensity between being the acquirer and the acquired is due to the issue of control brought up earlier.

To the acquiring medical group, they will be in control after the acquisition. However, the acquired medical group perhaps will loose control over much of its business protocol. There will be less culture shock and fewer operational changes taking place in the acquiring organization's business atmosphere than in the acquired's world. Thus, an important distinction is the difference in intensity levels depending on whether the medical group is the acquirer or the acquired.

Acquisitions between medical groups can provide either horizontal integration or some degree of vertical integration. Horizontal integration occurs when a medical group acquires another medical group with a similar specialty. A purpose of this horizontal integration type of acquisition would be to expand the acquiring medical group's service or market area.

Some degree of vertical integration is accomplished when a medical group of a specific specialty acquires another medical group of a different specialty. This could lead to almost complete vertical integration (within the realm of outpatient care) if, for example, the acquired medical group was a primary care group and the acquiring medical group was a comprehensive multispecialty group. Of course, the acquisition could be just the beginning

of vertical integration if the acquiring and acquired medical groups cannot provide all the necessary medical specialties to reach complete outpatient vertical integration. For a very detailed example illustrating medical group-medical group integration, see Coddington, Moore, and Fischer (1993).

Medical Groups and Hospitals

Since the time when hospitals were considered alms houses and were only for the poor and terminally ill, physicians and hospitals have had working relationships with the physician providing care as part of the hospital medical staff. The physicians and the hospitals in those earlier days shared a common purpose: to provide relief from pain and suffering to the patient. This common purpose implied the importance of two health care goals: (1) access; and (2) quality of care. However, in today's era of managed care, the relationships between medical groups and hospitals have been forced to include the goal of cost effectiveness to access and quality goals.

The inclusion of this third major goal has resulted in actual situations where all three goals of cost, quality, and access cannot be met completely and one or more must be satisficed, rather than reached. The balancing of these three often contradictory goals is what Burns and Thorpe (1993) meant when they stated that medical group and hospital relationships must have, as a central purpose, the goals of aligning and balancing incentives for both the medical group and the hospital.

There are four generic types of relationships between medical groups and hospitals: informal arrangements; formal arrangements; joint ventures; and acquisitions (including both the hospital being acquired by a medical group and a medical group being acquired by a hospital). These four relationships have differing levels of partner interdependence.

Informal Arrangements. Hospitals and medical groups have always had informal arrangements. For example, the traditional relationship of the hospital granting admitting privileges to a medical groups' physicians was typically an informal type of relationships, especially in rural areas where there were few choices of physicians. With these types of arrangements, both the medical group and the hospital are independent organizations and there is a relatively low amount of interdependence in the relationship.

Formal Arrangements. These relationships are formed with the express purpose of solving a common problem faced by both the medical group and the hospital. As with medical group-medical group formal arrangements, these medical group-hospital formal alliances can be created to solve administrative, negotiation, etc. problems. A survey of 402 hospital chief executive officers (Cerne, 1993) indicated that 43.6% currently link hospitals with medical groups using formal affiliations. Examples of medical group-hospital formal alliances include management service bureau and physician-hospital organizations. These two specific types of alliances are described next.

Management service bureaus (MSBs) are alliances that allow hospitals (or other third parties) to provide practice management services to independent medical groups (Burns and Thorpe, 1993; Cave, 1995). The hospital may offer various degrees of practice management services to the hospital's medical staff. The physicians are under no obligation to send patients to the hospital providing the management services, but they more than likely will, due to familiarity with the hospital and a sense of reciprocity.

This alliance is often not very strong for two reasons: (1) hospital staffs are not known for their ability to effectively and efficiently manage physician offices; and (2) if the management service bureau becomes unprofitable and closes or if it alters its pricing schedule, a real strain may occur in the medical group-hospital relationship, even though the medical group often shares in the governance of this alliance. While some of these MSBs may be based entirely on trust between the parties, it is more than likely governed by contract law. The level of relationship interdependence is typically only moderate.

Physician-hospital organizations (PHOs) are medical group-hospital relationships that involve joint planning between physicians and hospitals (Burns and Thorpe, 1993). This joint planning is performed for express purposes, such as presenting a unified negotiating front to managed care companies and/or allowing joint marketing efforts to be successful. In the

past, managed care contracts were negotiated separately by both medical groups and hospitals. Often these separately negotiated contracts conflicted with each other. However, this conflict only became known when a physician admitted a patient to the hospital. By that time, it would be too late to attempt a renegotiation of either the medical group's or the hospital's contract with the managed care organization. Therefore, PHOs are often formed to take a proactive view regarding negotiating with managed care organizations.

There exists a moderate degree of relationship intensity in these PHO relationships. Medical groups and hospitals must share information with each other in order to guarantee an optimal managed care contract for both parties. This sharing could sometimes involve information that the medical group and/or hospital would rather not share with the other party. While this sharing of proprietary-type information could be accomplished through the use of a joint venture (with its associated higher level of relationship intensity and commitment), the more common approach is to use a formal strategic alliance.

Joint Ventures. These partnering structures involve a higher level of relationship interdependence due to the sometimes large financial commitment made by both parties. Joint ventures are usually formed for very specific purposes, and result in the formation of a new entity, which is

typically governed by the partners, even if it is operationally managed by only one partner.

An example of a joint venture between a medical group and a hospital is the creation of a management service organization (MSO). An MSO can be formed for any of several reasons, some of which are: to present a unified front when negotiating contracts with payers; to reduce administrative costs; and, to prepare joint marketing plans. What makes this relationship different from those mentioned under informal and formal relationships is that the MSO typically purchases the tangible (i.e., physical) assets of the medical practices at fair market value, and leases them back to the medical group as part of a full service management agreement.

The MSO often employs all non-physician staff and provides all the necessary clinical supplies and administrative systems, such as billing and collecting, utilization, etc. (Cave, 1995). The medical group often has strong representation on the MSO board, but relinquishes some control over capital expenditures, salary levels, etc. The physicians are tied to the MSO through long term professional service contracts/agreements. Each physician submits claims under his/her own provider number. All the parties must work together in order to reap the potential benefits of this type of alliance.

Another joint venture type of relationship involves the hospital providing capital to build freestanding ambulatory care centers for the physicians of the medical group. This specific type of backward integration

(a form of vertical integration) has been shown to not be a source of competitive advantage for the hospital (Bigelow and Arndt, 1991).

Acquisitions. There are two types of acquisitions that can occur: the medical group can acquire a hospital or the hospital can acquire a medical group. The next highest intensity level relationship compared to a joint venture is an acquisition of a hospital by a medical group. This is a relatively rare type of relationship in U.S. health care. However, it is one potential avenue to achieve integration, especially when the physicians have adequate capital and a desire to integrate, but the hospital does not share that desire. This example is not meant to imply that all acquisitions of hospitals by medical groups are of the hostile type. Rather, it is just one explanation of why medical groups acquire hospitals. One goal of this type of relationship is greater utilization of hospital-type assets, since physicians would be more apt to utilize those assets they own.

These relationships generally have high levels of relationship interdependence. An example of this type of relationship is the physician equity organization. Assuming the physician owners represent all the necessary medical specialties, this alliance type could allow the physicians and the medical group to control all the elements of an integrated delivery system/network. However, it is also possible that medical group ownership of a hospital will not result in an integrated delivery system/network. For example, the medical group may not contain all the required medical

specialties to qualify as offering the complete continuum of outpatient and inpatient clinical care.

From the medical group perspective, an acquisition of the medical group by a hospital represents a very high level of relationship interdependence, because, for all practical purposes, the physicians become employees of the hospital. Cerne (1993) states that 38.9% of hospital chief executive officers and hospital chief operating officers (from a survey of 402 hospitals) state that their hospitals have purchased one or more medical groups.

An example of this acquisition relationship is the clinic ownership organization. The clinic ownership organization is basically an extension of the management service organization (MSO; described earlier). It owns the tangible assets of the physician partners (just like the MSO) plus it also owns all the intangible assets (patient records, physician reputation, etc.). Both the clinical and administrative sides of patient care are owned by the hospital. The physicians practice medicine under the provider number of the clinic ownership organization, which means, in essence, that the clinic ownership organization becomes the provider of care. All patient charges are billed under the clinic ownership organization's provider number. The individual physician's provider number is not used for billing purposes.

While practicing physicians can be self-employed contractors to the hospital, more than likely they will be hospital employees. The physician has

effectively relinquished all control over the delivery of patient care and over all business aspects of the practice of medicine, such as when to purchase new equipment, what type of equipment to buy, etc. Physicians generally dislike this type of arrangement due to the loss of both physician autonomy and financial independence. Physicians are, therefore, often offered majority representation on the clinic ownership organization's board. But that does not necessarily translate into power or control. Conflicts between the medical group and its physicians and the hospital are handled in a way that ensures survival of the alliance.

While on this topic of physician-as-hospital-employee, it is prudent to recognize that state laws may influence or even dictate the corporate practice of medicine. For example, in Texas, only physicians can legally own physician groups. Hospitals cannot own physician groups outright. There are, however, various organizational configurations that can be created that effectively allow non-physicians to run physician groups. While this discussion of state laws is interesting, it is beyond the scope of this study. However, this type of regulatory or legislative control reflects the complexity inherent when attempting to turn physicians into W-2 employees.

Summary of Extant Literature on Medical Group and Hospital Relationships. The largest amount of research involving collaboration in health care has been performed on the relationships between medical groups (or physicians) and hospitals. A brief review of these studies follows.

There are three types of specific integration between hospitals and physicians (Gillies et al., 1993): (1) functional integration (i.e., the extent to which key support functions and activities such as strategic planning, information management and financial management are coordinated and standardized across medical group and hospital operating units); (2) physician/hospital integration (i.e., the extent to which the physicians identify with the hospital and are involved in various aspects of shared accountability with the hospital (e.g., the physician is a board member, overall physician use of the hospital as a percent of total physician productivity, etc.); and (3) clinical integration (i.e., the extent to which patient care services are coordinated across the operating units of the medical group and the hospital (e.g., development of practice guidelines, medical records sharing, etc.). Gillies et al. (1993) found a moderate level of functional integration and low levels of physician/hospital integration and clinical integration.

In a survey of 1,143 hospitals and the corporate offices of 41 systems (per Cerne, 1993), 38% of hospitals were formally affiliating with medical groups, with 44% expecting to by 1998. In addition, 36% had acquired a medical group, with 39% expecting to by 1998. However, there is an expected drop in plans to implement PHOs (59% to 46% by 1998) and MSBs (62% to 44%).

A study of about 300 California hospitals (Goes and Zhan, 1995) searched for the relationship between physician involvement in the hospital and hospital performance. Hospital performance was defined using measurements of operating profits, occupancy, and costs. Support was found for the proposition that stated that as physicians move on a continuum from "complete physician autonomy" to "physician rents space from hospital" to "hospital performs physician billing" to "complete hospital supervision over physician," hospital performance increases. Mixed support was found for physician involvement in hospital governance (i.e., physician as a board member). No support was found for hospital ownership by physicians.

For a very detailed discussion of the different types of physician and hospital integration, see Coddington et al. (1993). Finally, a Delphi survey conducted by Arthur Andersen (1991) found that two-thirds of hospital executives think hospital-physician relationships are excellent or very good, while only half of physicians think so. A similar perceptual gap was found in Europe (i.e., United Kingdom, Finland, and the Netherlands). These are potentially troubling results, especially in today's perceived "collaborate or else" environment.

Medical Groups and Managed Care Organizations

While medical groups have dealt with various insurance organizations since the advent of health insurance, the relationships discussed in this

section are between medical groups and the new form of health care financing firms, managed care organizations (MCOs).

These new health care financing organizations have been around since the mid-1970s. They have evolved through several generations (Duncan et al., 1995). This first generation of MCOs had to compete heavily against the traditional system of third party payment—indemnity insurance. As such, the changes put in place by MCOs during their first generation of existence included what seemed like rather minor changes: placing limits on benefits if the patient by-passes primary care physician gatekeepers; relying on utilization review to dispute payments; and requiring second opinions for selected procedures in order for physicians to receive payment.

The second generation of MCOs began in the early 1980s. This time period introduced more changes to the delivery and financing of health care, including creating comprehensive provider networks and offering benefit differentials for in-network versus out-of-network providers. The U.S. health care industry is currently in the midst of the third generation of MCOs. MCO enrollment has exploded from 15 million members in 1984 to 49 million members in 1994 (Taylor, Beauregard, and Vistnes, 1995). This huge increase in enrollment provided the type of clout necessary for this third generation of MCOs to bring with it techniques and database management systems to: quantitatively measure quality of clinical treatment; perform

advanced physician credentialing (i.e., selection of physicians and monitoring the quality of clinical care); and allow for patient care management teams.

The introduction of MCOs to the traditional indemnity insurance organizations required that health care providers pay much closer attention to the interrelatedness of the interactions between physicians, medical groups, and hospitals in the treatment of patients (Harris, Hicks, and Kelly, 1992). MCOs effectively eliminated the firmly entrenched fragmented financing system. This fragmented payment system was not able to respond quickly enough to the new institutional and environmental forces demanding changes in the way providers deliver health care.

In a literature review on what is known about the arrangements MCOs make with medical groups (Gold et al., 1995), it was concluded that we really do not know much about the important features of these relationships. The authors argue that it is imperative that we study these relationships because of the pervasive and profound impacts MCOs are and will be having on the delivery of health care and the practice of medicine.

The are three types of relationships between medical groups and MCOs: third party contracts; risk sharing contracts; and acquisitions. These three relationships have differing levels of partner interdependence.

Third-Party Contracts. This is the traditional relationship between a medical group and a third-party payer. In these relationships, the medical group physicians provide services to patients who are covered under some

health plan of the MCO. The MCO pays the medical group for the services rendered, usually with a discounted fee-for-service schedule. The medical group accepts the discount because of the promise from the MCO for increased patient volume. This type of payment schedule is common when the MCO vehicle is the Group Model HMO (described earlier).

The relationship intensity of entering into third party contracts is relatively low. However, when such things as discounted payment schedules, stringent credentialing procedures, and comprehensive utilization review are included, the level of intensity of the relationship for the medical group increases.

Risk Sharing Contracts. This is the latest type of financing option for paying for health care services. These relationships between medical groups and MCOs represent a higher level of relationship intensity than the above relationships. This is because the medical group is now accepting some of the financial risk for treating patients. This payment process is typically referred to as capitation.

With capitation, the medical group receives a fixed amount of revenue to pay for an actuarially-determined type and number of procedures, given the health status of the defined patient population. If the medical group performs less of certain procedures, the medical group effectively makes extra money on those procedures. However, the risk sharing comes into play when the medical group finds that it has to perform many more procedures

or tests than were actuarially-assumed to be necessary. While there are payment appeals processes written into most of these capitation contracts, the entire relationship becomes more intense just because of the risk sharing involved, which causes the medical group to be much more open regarding sharing information and being subjected to extensive utilization review processes.

Acquisitions. Medical groups can elect to acquire MCOs or MCOs can acquire medical groups. Either of these types of relationships would indicate a high level of relationship intensity because of the issues inherent with any acquisition: cultural clashes, power struggles, etc. As with acquisitions of medical groups by hospitals, an acquisition by an MCO of a medical group would be of much greater relationship interdependence than would an acquisition of an MCO by a medical group.

Summary of Medical Group and Managed Care Organization Relationships. Managed care is becoming much more prevalent in all areas of health care delivery. Tricare Southwest in Texas (Cameron, 1995) is an example of the U.S. military exploring the world of managed care. However, even with the growing prevalence and prominence of managed care, and given that managed care is, itself, going through evolutionary changes (as described above regarding the different generations of managed care), MCOs are not likely to actually change organizational form from their initial start-

up form (Wholey and Burns, 1993, in a study of about 150 HMOs in business from the 1970s to 1980).

Medical Groups and Integrated Delivery Systems/Networks

Much of the current health care literature describes a health care delivery organization form that must include, at a minimum, the components of clinical treatment (i.e., medical groups and hospitals) and financing of treatment (i.e., MCOs). In addition, there can be other components such as pharmaceutical providers, high technology equipment manufacturers, and other suppliers to the health care industry. The premise behind these al-encompassing delivery systems is that they will transform health care from an individual, medical intervention (i.e., treatment after disease) model with fragmented delivery of preventive-to-tertiary care, to a community-oriented model of integrated preventive-to-tertiary care (Shortell, Gillies, Anderson, Erickson, and Mitchell, 1996)

When the three required components of medical groups, hospitals, and managed care organizations come together to deliver a complete continuum of care (encompassing both preventive and after-the-onset-of-illness treatment) to a defined population while sharing financial risk, the resulting organizational form is termed an integrated or organized delivery system (Shortell et al., 1993; Blair et al., 1995; Coddington et al., 1993, 1994, 1996).

By altering the underlying fundamentals of the way health care delivery has been accomplished in the past, integrated delivery systems are

expected to simultaneously satisfy the three traditional health care concerns of cost, quality, and access. These collaborative arrangements attempt to provide predictability to the uncertain future (Stevenson and Moldoveanu, 1995; Blair et al., 1995). They are described as seamless, virtual, and holographic (Shortell et al., 1993).

The U.S. health care industry has developed integrated delivery organizations in response to the hyperturbulent environment (Shortell, 1994), including: concern for the high and increasing health care costs; demographic changes (e.g., the aging of the population, which translates into more medical usage); and technological advances that ultimately lead to longer lives (Ackerman, 1992).

Examples of integrated delivery systems established by local and Federal governments include rural health networks (RHNs) and Veterans Integrated Service Networks (VISNs; Halverson et al., 1995). A survey of 1,143 hospitals and the corporate offices of 41 systems (per Cerne, 1993) found that 76% of respondents believe their organizations belong to an integrated delivery organization (including both informal and formal systems). O'Donovan (1994) states that about 150 integrated delivery organizations were in the development stage in 1994 and estimated that the ultimate number will be 300-400.

There are two different avenues for medical groups to become partners with integrated delivery organizations: (1) join a fully integrated system; and (2) join a loosely integrated network. There are many similarities

between joining a fully integrated system and joining a loosely integrated network. For example, medical groups tend to take a back seat to the larger, integrated organizations (Shortell et al., 1996). In addition, the goals of each type of integrated delivery organization are the same—to effectively offer the entire continuum of care for a given population. However, these two distinct avenues have differing levels of relationship intensity vis-à-vis interdependence, mostly tied to the level of formality and structure provided by the different organizations.

Fully Integrated Systems. These organizations have very formal roles and specified relationships for each of the component entities. There is a high level of commitment from the formal partners (who retain their legally separate identities) to make the system work so well that the incentives of all three component entities are met along with the health needs of the patient population.

This health care delivery organization has accepted complete responsibility for the total health care of a given patient base or population. The system has primary care locations that provide full geographic coverage for the system's entire service area. The system allows and oversees (through governance mechanisms) risk contracting between component entities to ensure that each component is able to protect its own interests without jeopardizing the interests of the integrated organization. All the component entities are strategically intertwined; thus the level of relationship intensity for the medical group is extremely high.

Loosely Integrated Networks. These organizations attempt to reach the same goals as their more fully integrated cousins discussed above without incurring as high a level of relationship interdependence. However, these loosely integrated organizations typically do not have the capability to oversee the component organizations (i.e., the governance function) to the same breadth and depth as the fully integrated organizations. Thus, the question that remains is: are more loosely coupled networks similar enough in structure and function to provide adequate imitations of the most tightly coupled system (i.e., the fully integrated delivery system)? This question reflects the issue of imitability as raised in the resource based theory of the firm.

It would seem a difficult task for a loosely integrated network to be able to provide as much competitive advantage (the major goal of RBV) as a fully integrated system. RBV implies that the more complex a system is, the less likely is will be for others to imitate it. For example, high levels of causal ambiguity, longer path dependence, and greater social complexity create barriers to imitability (Barney, 1995). Causal ambiguity can be caused by high levels of tacit knowledge and higher specificity in skills (Reed and DeFillippi, 1990). In addition, firm specific capabilities are difficult to imitate (Schoemaker and Amit, 1994). Therefore, greater complexity should lead to greater competitive advantage.

Summary of Medical Group and Integrated Delivery System/Network Relationships. There are various ways to measure the level of integration

within and the performance implications of these integrated delivery organizations. For example, three types of integration that occur in integrated delivery organizations have been identified: (1) functional integration (i.e., coordination across component entities); (2) physician/system integration (i.e., shared accountability between physicians and the integrated delivery organization); and (3) clinical integration (i.e., coordination of patient care services) (Devers et al, 1994).

It has been suggested that performance of integrated delivery organizations be assessed using measures of the number of physicians in leadership roles, the degree that primary care physicians are economically tied to the system well-being, and the level of coverage throughout the population's service area (Coddington et al., 1993). In addition, specific integrated delivery organization performance criteria could include: the performance indicators of the individual component entities (e.g., retention of physicians, number of patients treated, occupancy rates, profits, etc.); and the ability of the integrated delivery organization to meet community needs (e.g., satisfaction with cost, quality, and access issues) (Coddington et al., 1994).

Competitive Advantage

Competitive advantage is the ability of a firm to perform activities for less cost and/or more efficiently than its competitors. The presence of competitive advantage allows an organization to potentially earn above-

normal rates of return (Porter, 1985). It has been described as the implementation of value creating strategy that is not simultaneously being implemented by another firm (Barney, 1991).

There are different types of competitive advantage. For example, first mover advantage (e.g., patents, location, distribution systems, reputation), scale advantage (e.g., spread fixed costs over greater volumes, purchase discounts, vertical integration), and experience advantage (e.g., moving up the learning curve, path dependence) are but a few. Competitive advantage implies some sort of synergistic reaction to the combination of resources and capabilities brought together by one entity.

How important is competitive advantage? It has been suggested that the essence of strategy lies in creating tomorrow's competitive advantage faster than competitors can mimic today's competitive advantage (Hamel and Prahalad, 1993). Strategists have long recognized that competition is at the core of the success or failure of firms (Porter, 1985). Therefore, striving to reach some level of competitive advantage seems to be a worthwhile endeavor.

Competitive advantage reigns as *the* latest in a long line of changing criteria for measuring organizational effectiveness (Grant, 1995). According to Grant (1995), strategic management has gone through several eras in the last 50 years. In the 1950s, strategy was based on financial control (i.e., the

use of budgets for planning and resource allocation purposes; long-range planning per Bruton, Oviatt, and Kallas-Bruton, 1995).

The 1960s saw strategy lean toward the concepts of growth and expansion to grab as big a piece of the pie as possible. During the 1970s, strategy was used to manage portfolios of distinct businesses within organizations. The 1980s used strategy as a way to analyze competitors (i.e., positional strategy). The 1990s find firms using strategy to focus on resource analysis and competitive advantage. This makes the use of competitive advantage in this study very topical and appropriate.

Researchers of organizations have always have been interested in performance differences between firms (Carroll, 1993; Nelson, 1991). A popular approach to understanding these performance differences is rooted in the concept of competitive advantage (i.e., any source of superior performance vis-à-vis competitors). In fact, it has been argued that some kind of competitive advantage must be present in order to generate profits or ensure organizational survivability (Wernerfelt, 1984; Dierickx and Cool, 1989; Barney, 1991; Grant, 1991).

The traditional view of competitive advantage placed very little emphasis of the impact of idiosyncratic firm attributes on competitive positioning (Barney, 1991). Most early models of firm performance took the economic perspective that all firms were homogenous regarding resource control and strategies pursued. Firm heterogeneity was assumed to be short

lived because external resources were commodities and, therefore, highly mobile. However, it is now believed that firms control heterogeneous resources (Lado, Boyd, and Wright, 1992) that are somewhat immobile and that can be bundled with capabilities to form competitive advantage. This resource immobility leads to the heterogeneity of the resources being relatively long lived (Barney, 1991), even though it is recognized that the bundling tends to unbundle over time (Porter, 1985) due to the forces of recidivism.

Competitive advantage is an overarching term used to describe the competitive position of an organization. There are assumed to be four levels or ranges of this competitive position. These four levels are: (1) competitive disadvantage; (2) competitive parity; (3) competitive advantage; and (4) sustainable competitive advantage. Competitive advantage is defined as a period in which the organization has some resource that is both valuable and rare (Barney, 1995), but that is imitable or substitutable once competitors learn details about the resource (i.e., its durability ceases, per Grant, 1991).

Competitive parity, on the other hand, means that the organization has resources that, at best, only maintain the organization's relative competitive position vis-à-vis its competitors. Competitive disadvantage occurs when the organization cannot keep up with the new resources its competitors are developing or creating. Sustainable competitive advantage is defined as competitive advantage that can be maintained over a period of

time due to inimitability and/or non-substitutability (Barney, 1991) and due to durability, transparency, and transferability (Grant, 1991).

Barney (1995) discusses the levels of competitive advantage and sustainable competitive advantage in some detail using his VRIO model. VRIO stands for Valuable, Rare, Inimitable, and Organization. Resources and capabilities can lead to competitive advantage if they are valuable and rare. They can lead to sustained competitive advantage if they are valuable, rare, inimitable, and reside in an organizational infrastructure that capitalizes on their uniqueness. To these prerequisites for competitive advantage and its sustainability, Peteraf (1993) argues that the environment must provide some type of barrier to competition, such as entry barriers, etc.

This study argues that structural linkages of medical groups are examples of what Barney had in mind when he discussed the "O" in his VRIO model. From a health care perspective, providers must understand their specific community's health problems, and then address those needs by offering programs or services that are not currently being offered. The best way to find solutions to these deficiencies brought to light by community health assessments is to create new capabilities and provide access to required resources through new webs of relationships (Kanter, 1994). These webs of relationships will be discussed in this study when structural linkages with high levels of interdependence are presented.

Competitive advantage is increasingly important to health care organizations because the industry is in the midst of a major structural revolution. For example, many of the procedures performed in hospitals in the recent past are now being provided through freestanding clinics and/or mobile units (e.g., rehabilitation, dialysis, and diagnostic imaging). Hospital inpatient surgeries have decreased from 75% of all surgeries in 1983 to less than half (i.e., 48%) of all surgeries in 1991 (Wolper, 1995). This has led to a corresponding reduction in inpatient revenue from 82% of hospital revenue in 1985 to a projection of only 50% of hospital revenue by the year 2000 (Wolper, 1995).

The presence of managed care in many markets is pressuring health care organizations to control costs and assume greater financial risk for the health outcomes resulting from their services (Halverson et al., 1995). Much of the emerging health care literature champions the development of a specific type of IOR—integrated health care networks and systems.

In this era of increased pressure to integrate and work cooperatively while also maintaining competitiveness (D'Aunno and Zuckerman, 1987; Browning et al., 1995), hospitals, medical groups and health plans are creating vertically integrated networks and systems (Burns and Thorpe, 1993; Gillies et al., 1993; Shortell et al., 1993; Blair et al., 1995). These new systems can be described as structures (Schulze, 1994) that bundle different

types of resources to, hopefully, contribute to competitive advantage for organizations.

Some authors argue that health care managers are creating these vertically integrated organizational forms for the financial purpose of creating oligopolies and monopolies (Weil, 1996). This study assumes that health care integration is market based with the purpose being to create value for payers and patients (per Coddington et al., 1996), as well as competitive advantage for health care organizations. Specifically, value is added in health care structural linkages by combining the following attributes: improving quality of care; emphasizing service (e.g., waiting times, friendliness of staff, etc.); improving accessibility; reducing unit costs; improving operating efficiency (e.g., reducing unnecessary care, etc.); strengthening customer relationships; and enhancing product offerings.

In summary, it is assumed in this study that structural linkages are created for the purpose of maximizing collaborative advantage. Therefore, even though there are many differences between the health care industry and other industries (e.g., the consumer of the product not being either the decision maker regarding purchasing nor the payer, per Fottler, 1987), the basic rationale for entering IORs in health care is the same as other industries—to maximize potential for organizational survival. Thus, structural resources of health care organizations can be seen as potentially leading to competitive advantage.

Relevant Studies and Gaps in the Literature

A perusal of the literature finds several articles and books relevant to this study. These relevant studies include conceptual pieces (as shown on Table 2.4) and empirical pieces (as shown on Table 2.5).

These representative studies indicate that many topics pertinent to this study have been discussed and/or tested from several different angles, including RBV and competitive advantage (Barney, 1991, 1995; Peteraf, 1993), resources (Hall, 1992; Brumagin, 1994; Collis, 1994; Collis and Montgomery, 1995), and IORs (Borys and Jemison, 1989; Kanter, 1989, 1994; Miner et al., 1990; Oliver, 1990).

The health care industry has been studied from an overall point of view (Arthur Andersen, 1991; Blair et al., 1995). Health care structural linkages have been conceptualized to affect hospital performance (Fottler, 1987; Nix, Rotarius, Buesseler, and Dymond, 1996). Health care integration concepts have been discussed (Burns and Thorpe, 1993; Shortell et al., 1993; Blair, Nix, Buesseler, Dymond, and Kiecker, 1994; Shortell et al., 1994; Gold et al., 1995; Zuckerman et al., 1995) and some have been tested (Bigelow and Arndt, 1991; Gillies et al., 1993; Coddington et al., 1994, 1996; Dymond, Nix, Rotarius, and Savage, 1995; Goes and Zhan, 1995; Provan and Milward, 1995; Rotarius, Paolino, McMurrough, Fottler, and Blair, 1995).

Table 2.4

Relevant Conceptual Research

Author/Date/Focus*	Variables Examined	Results
Fottler, 1987. Focus: Health care organizational performance.	Environment. Clinical quality, cost efficiency, patient satisfaction, financial outcomes.	Uniqueness of health care industry. Organizational structure can affect performance.
Borys and Jemison, 1989. Focus: Hybrid organizations (IORs).	Hybrids organizations lying on continuum between markets and hierarchies.	Important factors in hybrids are breadth of purpose, boundary determination, value creation, and stability.
Kanter, 1989. Focus: IORs.	Pooling, allying, and linking of organizations.	Partnering changes levels of power, types of job skill, commitment.
Oliver, 1990. Focus: IORs.	Determinants of IORs based on type of relationship.	Contingencies are: asymmetry, reciprocity, efficiency, stability, and legitimacy.
Barney, 1991. Focus: RBV.	Firm resources. Competitive advantage.	Value, rare, inimitable, and non-substitutable lead to competitive advantage.
Hall, 1992. Focus: Resources.	Durability of intangible resources and competitive advantage.	Order of durability: functional, positional, cultural.

*Individual papers are listed in chronological order and then alphabetical within each year.

Table 2.4 continued

Author/Date/Focus	Variables Examined	Results
Burns and Thorpe, 1993. Focus: Physician-hospital models.	Physician-hospital organizations (PHO); management services organizations (MSO); foundations; integrated health organization.	Purposes of different models: contracting with MCOs; access to patients and capital; improved competitive position.
Peteraf, 1993. Focus: RBV.	Environmental conditions for competitive advantage.	Requires heterogeneous resources, imperfect mobility, ex-post and ex-ante limits to competition.
Shortell, Gillies, Anderson, Mitchell, and Morgan, 1993. Focus: Integrated delivery systems.	Key characteristics are breadth, depth, and geographic concentration.	Barriers to integration include inabilities to see issues like primary care importance and managed care prevalence.
Blair, Nix, Buesseler, Dymond, and Kiecker, 1994. Focus: Networks as competitive advantage.	Networks as assets. Networking as skills.	Four types of networks based on high and low values of network assets and networking skills.
Brumagin, 1994. Focus: Resources.	Hierarchical model of resources (vision, learning, administrative, functional).	Certain groups of resources are more complex than others.
Collis, 1994. Focus: Capabilities.	Types of capabilities (static, dynamic, creative).	Ability resides in tacit collective knowledge so cannot be instantly imitated.

Table 2.4 continued

Author/Date/Focus	Variables Examined	Results
Kanter, 1994. Focus: Collaborative advantage.	Skills in managing alliances to create value for partners.	Success of alliances: must be strategically important to partners, need complementary resources.
Shortell, Gillies, and Anderson, 1994. Focus: Integrated delivery systems.	Resources: system size; community-based needs assessments; capitation; governance structure.	Key success factors can overcome some barriers to integrating.
Barney, 1995. Focus: Competitive advantage.	Resources must be value adding, rare, inimitable, and must have organization.	Organization infrastructure is a complementary resource.
Collis and Montgomery, 1995. Focus: Resources.	Scarcity, demand, and appropriability of resources.	Value-creating zone of resources is where these three overlap.
Gold, Nelson, Lake, Hurley, and Berenson, 1995. Focus: Physician-MCO integration. 1993-1995.	Literature review of critical features of plans/arrangements between MCOs and physicians.	Knowledge is dated. Limited set of MCO plans studied. Structure of plans ignored.
Zuckerman, Kaluzny, and Ricketts, 1995. Focus: IORs.	Lateral and integrative alliances.	Sustaining alliances requires commitment and mutual benefits.
Coddington, Moore, and Fischer, 1996. Focus: Integrated health care systems. N=150+ firms; 20 cases	Quality of care; service; accessibility; costs; efficiency; customer relationships.	Resources need to add value to improve competitive advantage.

Table 2.4 continued

Author/Date/Focus	Variables Examined	Results
Nix, Rotarius, Buesseler, and Dymond, 1996. Focus: Competitive advantage.	Member of different types of integrated delivery organizations.	Mixed results regarding whether loosely- or fully-integrated firms likely to lead to competitive advantage.

Table 2.5

Relevant Empirical Research

Author/Date/Focus*	Variables Examined	Results
Miner, Amburgey, and Stearns, 1990. Focus: IORs. N=1,000 firms.	IORs are buffers which protect partners from resource loss.	IORs lower failure rate and buffer from exogenous shocks.
Arthur Andersen, 1991. Focus: Health care industry. N=2,600 executives.	Payment, environment, purchasers, resources, roles of organizations, relationships.	Affiliations used as mechanisms to cope with changes.
Bigelow and Arndt, 1991. Focus: Backward integration and performance. N=17 hospitals. 1982-1987.	Does hospital sponsorship of ambulatory care centers affect inpatient admissions, market share, or competitive position?	No support that ambulatory care centers affected any of the factors studied.
Gillies, Shortell, Anderson, Mitchell, Morgan, 1993. Focus: Measuring integration. N=9 systems.	Types of integration: clinical; physician-system; functional.	Low levels of clinical and physician-system. Moderate level of functional.
Coddington, Moore, and Fischer, 1994. Focus: Integrated health care systems. N=60 firms; 10 case studies.	Role of primary care physicians; governance structures; health care financing; outcomes measurement.	Lessons learned about health care integration. Case studies indicate that health care systems are in varying degrees of integration.

*Individual papers are listed in chronological order and then alphabetical within each year.

Table 2.5 continued

Author/Date/Focus	Variables Examined	Results
Blair, Fottler, Paolino, and Rotarius, 1995. Focus: Medical group response to environment. N=580-686. 1989, 1994, 1999; 1995, 2000.	IDS/N outcomes and structure. Capabilities which lead to competitive advantage.	Ability to work collaboratively with other health care firms key to competitive advantage.
Dymond, Nix, Rotarius, and Savage, 1995. Focus: IDS/Ns as medical group stakeholders. N=686 medical groups. 1995 and 2000.	Control of medical group; coalition formation; resource control.	MCOs and IDS/Ns are increasing potential to control medical group and control resources.
Goes and Zhan, 1995. Focus: Integration and hospital performance. N=330 hospitals. 1981-1990.	Physician involvement in hospital governance; hospital ownership by physicians; integrating financial relationships.	Partial support for governance issue. No support for ownership issue. Support for financial issue.
Provan and Milward, 1995. Focus: Networks and performance. N=4 networks.	Centralized integration; external control; stability; resource munificence.	Case studies indicate that network structure and context affect performance.
Rotarius, Paolino, McMurrough, Fottler, and Blair, 1995. Focus: IDS/Ns. N=580 health care. experts. 1994 and 1999.	Membership and control of IDS/Ns. Autonomy of hospitals and medical groups	Medical groups expect to participate in IDS/Ns through a variety of avenues. Loss of autonomy for both hospitals and groups.

These studies show that there is a gap in the empirical literature regarding the areas of: (a) which structural linkages affect competitive advantage; and (b) what the effect is of structural linkages on competitive advantage. This indicates that one of the problems associated with studying structural linkages and their effect on competitive advantage is a limited knowledge base about the topic of structural linkages as resources.

As mentioned earlier, prior research has explored the structural determinants of performance (Fottler, 1987; Nix et al., 1996). Specifically, Fottler discussed how the traditional structures in the health care industry were affected by various performance measures, including cost efficiency and clinical quality. However, many new organizational forms have emerged since that particular study.

Nix et al. (1996) conceptualized that structural linkages vis-à-vis integrated delivery organization membership should affect competitive advantage. Therefore, this study should build on the above research. Building onto existing research, rather than always creating brand new concepts, is desperately needed in strategy research (Montgomery, Wernerfelt, and Balakrishnan, 1989; Huff and Reger, 1987).

In addition, researchers have also indicated that more studies are needed that: (a) provide an understanding regarding the factors that give rise to or impede cooperative relationships between organizations (Ring and Van de Ven, 1994); (b) explore collaboration (Fahey and Christianson, 1986;

Daft and Lewin, 1993); (c) determine how organizations establish competitive advantage (Fahey and Christianson, 1986); (d) incorporate a context specific knowledge (Blair and Hunt, 1986; Daft and Lewin, 1993; Huff and Reger, 1987; Montgomery et al., 1989) to the studying of a context free problem; (e) explore health care using non-hospital organizational forms (Blair and Boal, 1991); (f) expand the unit of analysis to networks (Auster, 1994); and (g) understand how the formation of IORs help an organization acquire resources (Auster, 1994). This study should be able to lend insight into these identified topics that researchers suggest require further examination.

The four health care organizations that are partners of medical groups in this study include: (1) other medical groups; (2) hospitals; (3) managed care organizations; and (4) integrated delivery systems/networks. The types of relationships between medical groups and these potential partners are expected to range from loosely linked to moderately linked to tightly linked on an interdependence level continuum.

These four partners and the different levels of relationship interdependence can be combined in various ways. In this study, these different combinations are called SIGs. Based on the number of partners and the partner interdependence level, specific SIGs are expected to lead to different levels of competitive advantage.

Theoretical Typology of Structural Integration Groups

The two dimensions of number of partners and interdependence level between the partners are expected to combine into SIGs. For simplicity in understanding the concept of SIGs, each dimension is represented by only two possible values (i.e., the endpoints along the continuum). For example, number of partners is categorized as either many or few, while interdependence level is seen as being either high or low.

Number of Partners

The SIG dimension of number of partners can be conceptualized as ranging from few partners to many partners. When an organization has few partners, the pattern of structural relationships is described as *narrow*. When there are many partners, the structural relationship pattern is considered *broad*. However, how many partners make an organization most successful?

An organization with fewer partners may be able to internally respond more rapidly to changing environmental circumstances than one with more partners. On the other hand, an organization with more partners may have more opportunities to capture resources that it does not possess internally (Barney, 1991; Kanter, 1989). There is validity to both of these arguments. In fact, the answer to whether it is advantageous to have a few or many

partners is contingent upon organizational and environmental contexts and is suited to an empirical study, not conjecture.

For the medical groups in this study, few partners implies one, or perhaps two, different types of organizations as partners (the four potential partner organizations are: (1) other medical groups; (2) hospitals; (3) managed care organizations; and (4) integrated delivery systems/networks). Many medical group partners would be four, or perhaps three, of these four potential types of partner organizations. These varying patterns of interrelationships occur because different organizations require different amounts and types of resources from the environment. The level of resource dependence (Pfeffer and Salancik, 1978) depends on each organization's specific pattern or network of resource needs.

Level of Partner Interdependence

The SIG dimension of level of partner interdependence can be conceptualized as ranging from low to high. When an organization is involved in low interdependency relationships, the pattern of structural relationships is described as *loosely-linked.* When there are high interdependency relationships, the structural relationship pattern is considered *tightly-linked.* Which partner interdependency pattern is better,

loosely-linked or tightly-linked? There is not a straightforward answer to this question.

An organization with low levels of partner interdependence shares many of the characteristics of loose coupling (Weick, 1976) and pooled interdependence (Thompson, 1967). Loose coupling results in flexibility and autonomy among individual partners. Pooled interdependence allows each partner work together for a common goal, while also striving for individual goals. Work performed is interrelated only in that each element or process contributes to the ultimate overall goal. In health care, examples of low interdependence relationships are referral patterns and informal alliances. These "soft" organizational structures are characterized by flexibility, autonomy, and non-common goals, and, can lead to situations where creativity and learning are fostered.

An organization with high levels of partner interdependence has common characteristics with both tight coupling (Weick, 1976) and reciprocal interdependence (Thompson, 1967). These characteristics include, respectively, centralization of decision making and a focus by all partners in a concentrated manner on the main collaborative effort. Elements in the process relate to each other in a symbiotic manner. The elements are both inputs and outputs to each other. Involvement by the medical group in an integrated delivery system/network would be one of several possible examples of high interdependence level for this study's medical groups.

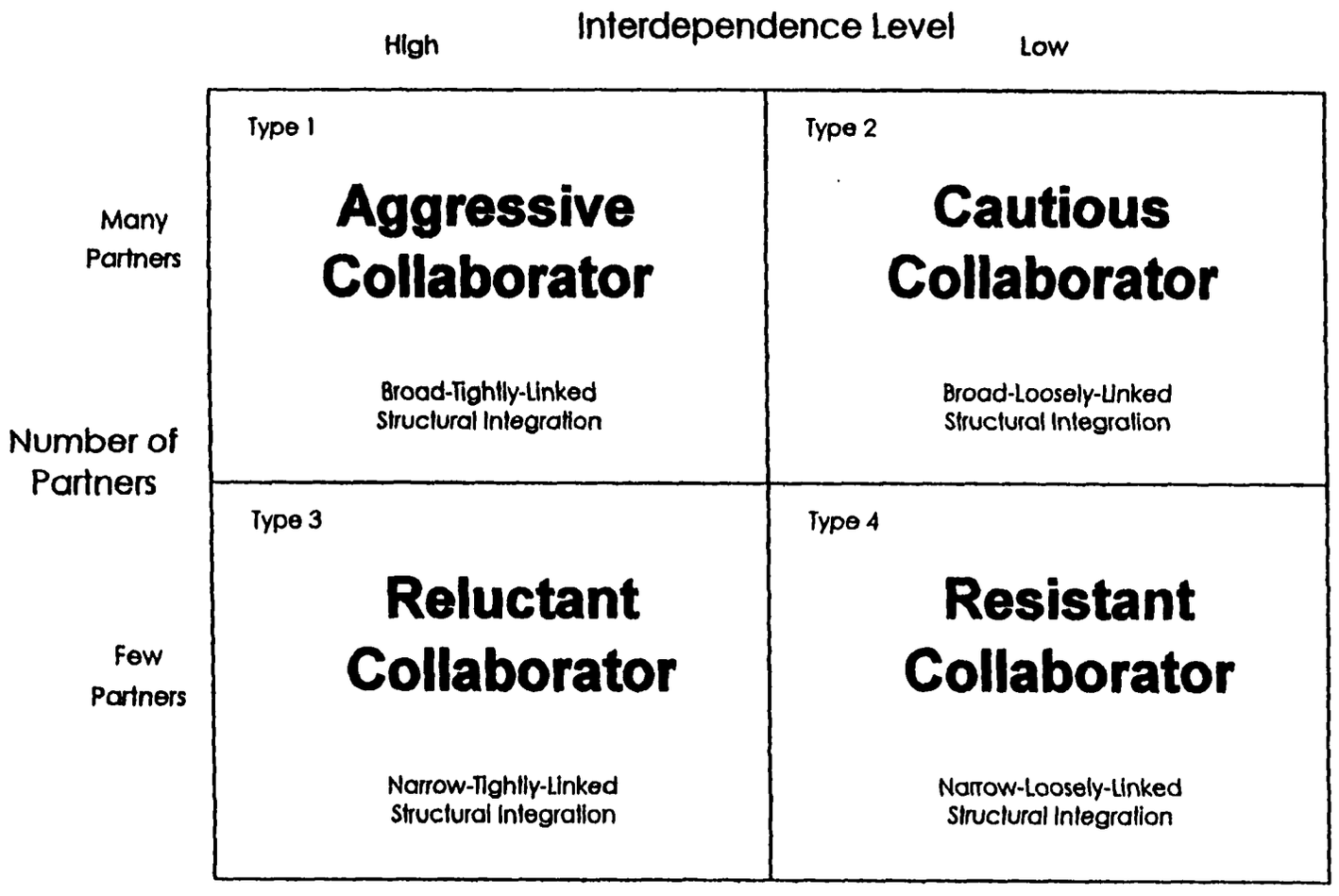
These tightly linked structures can lead to interdependencies with high asset specificity (Williamson, 1991) that have a unified vision and an allocation of ample resources by all the partners.

Combining the Two Dimensions

Figure 2.2 illustrates a fourfold typology of ideal, or pure, kinds of SIGs based on the two dimensions of number of partners and level of partner interdependence. A discussion of each pure type follows.

Type 1—Aggressive Collaborators. This type of SIG contains organizations that are characterized by many integration partners and a high level of partner interdependence. These organizational members exhibit a broad-tightly linked structural integration pattern. They have many highly interdependent stakeholders with, perhaps, investments in highly specific assets. These organizations devote many resources to boundary spanning and bridging activities as they monitor partners to ensure that each partner is at least minimally satisfied. These organizations believe collaboration is necessary for movement into new markets. They are willing to take the risks associated with trusting other organizations in order to enhance organizational survival by gaining the anticipated benefits.

In health care, an example of an aggressive collaborator medical group would be one which has been enveloped by an integrated delivery system



(Logical, *a priori* types that may or may not appear in pure form among the empirically-generated types.)

Figure 2.2: Conceptual Typology of Structural Integration Groups.

(IDS) and, therefore, has many partners (i.e., other medical groups, hospitals, managed care organizations, and the IDS, itself) and is tightly-linked to the partners via such avenues as very strong commitments, many contractual ties, high joint financial investment, etc.

Type 2—Cautious Collaborator. Organizations classified as this type of SIG are characterized by many integration partners and a low level of partner interdependence. These organizational members exhibit a broad-loosely linked structural integration pattern. Cautious collaborators are somewhat untrusting of other organizations, although they believe collaboration is the right avenue for the future in order to enhance movement into new markets. They also find safety in numbers and are apt to jump on the collaboration bandwagon as it rolls by in order to increase perceptions of organizational survival.

A medical group operating in a loose network of health care organizations would be an example of this ideal type of SIG. A network of health care organizations brings together the major components of health care delivery and financing (i.e., medical groups, hospitals, and health plans) in somewhat informal and/or less-committed ways. For example, while all organizations in the network share a common interest in the success of the network, the separate organizations, including the medical group, likely have other relationships (e.g., contracts, etc.) with non-network organizations also.

Type 3—Reluctant Collaborator. This SIG ideal type is characterized as one that has few partners, yet experiences a high level of interdependence with the partners it does have. These organizational members exhibit a narrow-tightly linked structural integration pattern. They are likely to have investments in highly specific assets with a few very important stakeholders. Their boundary spanning and bridging activities use minimal resources.

These organizations are also likely to have less power than their key stakeholders and, therefore, devote many resources to ensuring that their partner stakeholders are satisfied. They are probably not really committed to the concept of collaboration. In fact, they may feel threatened by collaboration and are, perhaps, only involved in integration efforts when they see no other alternative to organizational survival. They tend to put all their integration eggs in one basket.

In health care, an example of a reluctant collaborator medical group would be a specialist practice which enjoyed prosperity when fee-for-service payment was common. With the introduction of managed care and the primary care gatekeeper concept, this type of specialty practice now faces financial ruin and is forced to join with others in order to receive a share (albeit a much smaller share than before) of the shrinking payment pie. This organization may become partners with other medical groups only for very

explicit purposes such as creating joint marketing plans or to present a unified negotiating posture to a health care financing organization.

Type 4—Resistant Collaborator. This type of SIG contains organizations that are characterized by few integration partners and a low level of partner interdependence. These organizational members exhibit a narrow-loosely linked structural integration pattern. Resistant collaborators are distrusting of others and do not, therefore, believe in collaboration. In fact, they actively resist all collaboration efforts, except for relatively minor contractual agreements. These organizations spend many resources defending their niches from others and believe they have found the best way to survive in their world. They do not actively seek new markets and boundary spanning and bridging activities are virtually nonexistent.

A medical group involved in a group practice without walls (GPWW) and perhaps a few other similar types of relationships would be a health care example of an organization classified within this ideal type of SIG. GPWWs are typically formed for the purpose of creating economies of scale regarding administrative functions that every medical group performs. For example, medical groups could form a GPWW to provide common scheduling or billing functions. The intent would be to reduce the individual overhead expenditures for each medical group, without creating particular ties between medical groups. A GPWW generally provides no incentives for

cross-referral patterns or other types of commitment-enhancing (i.e., higher levels of interdependence) activities. Rather, each medical group continues to operate very independently of the other medical groups.

Summary of Conceptually Created Types of Structural Integration Groups. In summary, Figure 2.2 presents a logical, *a priori*, typology of SIGs. These SIGs are based on the two dimensions of number of partners and partner interdependence level. While these ideal types can be theoretically discussed, they may not exist in pure form in the particular dataset used in this study. However, these ideal types are useful for developing propositions and for interpreting any empirically generated SIGs.

These SIGs share characteristics with a heavily researched construct, strategic groups. However, there also exist several significant differences between SIGs and strategic groups. The next section discusses these similarities and differences.

Comparison with Strategic Groups

This concept of SIGs is similar to the concept of intra-industry strategic groups (McGee and Thomas, 1986). The strategic group literature indicates that the strategic group concept has been around for about 25 years. Hunt (1972) coined the term to facilitate his explanation of the performance differences of firms in the appliance industry. He found that

firms in this "white goods" industry could be grouped or clustered together based on similar patterns or combinations of the strategic factors of vertical integration, product diversification, and product differentiation.

Since Hunt's dissertation, strategic group research has developed into a significant and popular arena for the investigation of organizational structure, competitive behavior, and performance (Dixon, 1994). Strategic group membership and firm performance have been asserted by many researchers to be related (Barney and Hoskisson, 1990). However, reviewers of the strategic group concept have found inconsistent results in this hypothesized relationship (Dixon, 1994).

Strategic groups imply that the intra-industry patterns of strategic factors are heterogeneous (Barney and Hoskisson, 1990). In other words, if all firms in the same industry exhibit the same pattern of selected strategic groups (i.e., resource scope and deployment), then the concept of strategic groups has no meaning. Performing analysis on strategic groups is an intermediate level of analysis (Dixon, 1994). Strategic groups lie somewhere between firm level of analysis and industry level of analysis (Reger and Huff, 1993).

In the health care industry, it has been shown that strategic group membership of nursing homes, based on the factors of resource deployment, market segmentation, and services offered, is positively associated with the nursing homes' ability to respond to regulatory initiatives (Zinn, Aaronson,

and Rosko, 1994). That study indicated that strategic groups do exist in the health care industry (at least as these groups are defined by these researchers).

This study creates and test SIGs. These SIGs are similar to the strategic groups discussed above. For example, intra-industry strategic group membership is hypothesized to affect organizational performance. It is suggested in this study that intra-industry SIG membership affects competitive advantage, rather than a specific type of quantifiable performance measurement.

Strategic groups are generally created based on strategic factors that each organization controls, independent of any other organization. SIGs, as defined here, are based on the combining of the two strategic factors of choice of partner and the level of interdependence between the partners in the relationship. As such, it is not just another type of strategic group membership. Instead, strategic groups and SIGs have differing foci and intentions: strategic groups focus on competitive strategies and single-party intentions whereas SIGs focus on cooperative strategies and multi-party intentions.

Although strategic groups and SIGs are different concepts (based on the level of individual organizational control over the strategic factors used to cluster the organizations into groups), there are similarities between the two. For example, each grouping concept: (a) is based on intra-industry

comparisons; (b) has an analysis level between organizations and industries; and (c) has a performance construct as the dependent variable. These similarities between the strategic group concept and this new concept of SIGs allow for similar methodologies to be used for the analysis of both strategic groups and SIGs, even while allowing for SIGs and strategic groups to be different conceptual constructs with different underlying bases.

Propositions

The literature review for this study indicates several research areas that can benefit from further exploration. This specific study adds to the literature by examining some of these potential research areas. The propositions tested in this study are discussed next. They categorized by the specific research questions identified earlier. Each research question is restated prior to stating the propositions.

Propositions Related to Research Question #1

Research question #1 asks: Do SIGs exist and, if so, what do they look like? There are two propositions to be explored regarding this specific research question.

The earlier discussion on the similarities and differences between SIGs and strategic groups concluded with the notion that the conceptual similarities allow for similar methodologies to be used when empirically

examining the two different concepts. These same conceptual similarities lead to the conclusion that SIGs, like strategic groups, will be based on two or more different strategic dimensions. Thus, the following propositions are suggested.

Proposition 1a: SIGs exist in a parallel fashion to strategic groups.

Proposition 1b: The SIGs empirically discovered in the data will be consistent with four conceptual (pure) types of SIGs based on the two structural linkage dimensions of number of partners and level of partner interdependence.

Propositions Related to Research Question #2

Research question #2 asks: Are there environmental and/or organizational characteristics which predict an organization's membership in specific SIGs? Due to the contingent nature of organizational response to environmental pressures, and given the inherent specificity of organizational characteristics, a context-specific setting is necessary to adequately analyze this research question.

The hyperturbulence of the health care environment is being managed by health care organizations through the formation of multi-organizational arrangements that are designed to withstand the revolutionary changes taking place. For example, as the payment mechanism moves from fee-for-

service to capitation (i.e., as the health care environment becomes more turbulent), the amount of collaborative efforts should increase. This is due to the nature of capitation and its focus on making providers share financial risk of treatment. Providers are, in effect, forced to work together in order to beat a common foe (i.e., the hyperturbulence) and to seek stability from the uncertainty in the environment. Thus, this proposition is offered.

Proposition 2a: Environments representing a *changing* operating paradigm lead to organizational membership in SIGs that have *more* partners and *higher* levels of partner interdependence.

Organizations can be classified as simple and non-analytical or complex and analytical. Complexity would be indicated by such attributes as larger size, multiple products, many hierarchical levels, etc. Analytical characteristics would include significant resource allocation to boundary management and stakeholder management activities, strategic analyses (e.g., SWOT, etc.), etc. It is likely that that organizations high on analytical attributes would also be considered complex.

For example, medical groups that own and operate a managed care plan would likely be considered complex and analytical. These types of medical groups are characterized as being at the forefront of the new health care structural mechanisms. They have already established important

structural links with the financing portion of health care and they would, therefore, be more likely to form more collaborative arrangements. In addition, more complex organizations may possess the necessary slack resources (and the foresight to use those slack resources) to engage in more complex relationships with more partners. Therefore, the following proposition of presented.

> Proposition 2b: Organizational demographics characterized as *complex and analytical* lead to organizational membership in SIGs that have *more* partners and *higher* levels of partner interdependence.

Propositions Related to Research Question #3

Research question #3 asks: Does membership in SIGs lead to organizational competitive advantage? This question refers specifically to the conceptually generated typology of SIGs presented in Figure 2.2. The competitive advantage implications of SIGs represent the blending of two distinct and separate dimensions (i.e., number of partners and level of partner interdependence) of structural linkages. These two dimensions are discussed next vis-à-vis their proposed independent effects on competitive advantage. This is followed by the expected blended effect these two dimensions have (via SIGs) on competitive advantage.

Number of Partners. The general argument regarding the number of partners is that more partners should lead to higher competitive advantage. From a resource dependence perspective (Pfeffer and Salancik, 1978), no organization can possess all of its required inputs. Organizations, therefore, must secure some inputs from the environment. This can only be accomplished through relationships with other organizations.

The more relationships a firm has with other organizations, the more possibilities or chances the firm has to gather resources it does not possess internally. In addition, as organizations enter into more relationships, the opportunities for creative bundling of resources increase. To the extent that this creative bundling leads to unique resources, value is added to the organizations (Barney, 1995; Black and Boal, 1994).

From a purely theoretical viewpoint, the number of structural linkages between even a small number of organizations can be quite large. In reality, however, organizations have limited human, physical, and financial resources to use for creating, monitoring (from an agency theory perspective), and maintaining collaborative activities. Since health care is provided on a local scale (i.e., the market or service area is generally finite and, hence, considered "local"), there are, in reality, a very limited number of structural linkages that can actually be formed, especially given the usually limited number of health care organizations within a "local" market.

These arguments imply that the dimension of number of partners contains a "rareness" characteristic. Since relationships with a higher level of interdependence require even more resources to manage them (i.e., managerial attention, financial investment, etc.) than relationships with lower levels of interdependence, there clearly must exist a practical limit to the number of structural linkages (especially higher interdependence level linkages) that a given group of organizations can effectively implement. This implies that it is more rare to find organizations with many partners than to find organizations with fewer partners.

From the IOR perspective, partnering implies the use of collaborative strategies by the partners in order to allow the partners to do more with less, especially when the each partner has limited resources (Berquist et al., 1995; Kanter, 1989). Collaboration often increases the complexity of partner organizations and results in a value adding complex partnership (Mitchell and Singh, 1996). In addition, collaboration results in webs or networks or patterns of linkages between organizations that create value by injecting stability into the uncertain environment.

In summary, more partners provide more value to the organizations due to collaborative advantages (Kanter, 1994) such as access to more resources, potential for bundling of unique resources, stretching of limited resources (Hamel and Prahalad, 1993), and creation of complex webs of partners (Lorenzoni and Baden-Fuller, 1995) to provide stability in an

uncertain future. In addition, it is rare to find organizations with relatively more partners due to reasons such as limited monitoring resources and a practical limit to the amount of partners any organization can have. Resources that are both valuable and rare are capable of increasing organizational competitive advantage (Barney, 1991; Grant, 1991).

Level of Partner Interdependence. The general argument is that higher levels of partner interdependence result in higher organizational competitive advantage than lower levels of partner interdependence. This has been shown to be true in health care. Specifically, the presence of integrated delivery systems, an organizational structure with very high levels of partner interdependence, allow for enhanced product offerings (Coddington et al., 1996) and results in both greater flexibility and more efficiency for the different component organizations, thus allowing the integrated delivery system component organizations to adapt to market and environmental changes in a better and faster manner (Coddington et al., 1994).

Higher interdependence (e.g., reciprocal interdependence per Thompson, 1967) results in higher asset specificity (Williamson, 1991) which can be very beneficial to partnering health care organizations because of the continuous exchanges inherent in the seamless delivery of health care brought about by the third generation of managed care in the 1990s (Duncan et al., 1995). On a related note, in the automobile industry, more tightly

coupled IORs have been shown to outperform loosely coupled relationships (Dyer, 1996).

In summary, higher levels of partner interdependence in health care will lead to higher competitive advantage for the partnering organizations. This higher interdependence levels enhance the flexibility and efficiency available in the health care field because health care delivery operations are, by nature, tightly linked, team efforts.

Summary of the Two SIG Dimensions. The preceding discussion showed that each of the two dimensions of SIGs have separate competitive advantage implications for the partnering organizations. For example, it was argued that when an organization has many partners, it should experience higher competitive advantage. In addition, when an organization has higher levels of partner interdependence, it should also have higher competitive advantage. However, there are other organizational theories that, from a context free perspective, seem to make different competitive advantage arguments. As will be seen, though, from the context specificity of medical groups in the health care industry, these other organizational theories also point to the same general competitive advantage conclusions as presented above. For illustrative purposes, the theories of transaction cost economics (TCE) and open systems/loose coupling will be examined.

TCE (Williamson, 1986, 1991) seeks to find the governance structure that produces the lowest exchange costs. It is argued that organizations

develop in order to reduce the transaction costs of exchanges within the market. Thus, organizations internalizing the exchanges, rather than allowing separate organizations to meet in the market for exchange purposes. This functionalist approach argues for an organization to have fewer partners and, instead, internalize (i.e., own) the processes in the production stream. This sounds contradictory to the arguments presented in this study that say more partners should lead to higher performance (i.e., competitive advantage). However, the context specificity of the health care industry ensures that the major TCE idea of lowest exchange costs is actually met with more partners.

For example, in the health care industry, many legal and regulatory barriers exist that prohibit full internalization of the complete spectrum of medical treatment. For instance, the state of Texas prohibits any entity except physicians to legally own physician groups. Non-physician entities, such as hospitals, cannot be direct owners of physician groups. In addition, there are numerous examples of health care organizations combining into one organization for efficiency reasons, only to have the Justice department launch a full-scale investigation into possible violations of antitrust laws.

The result of these types of laws and regulations is that full and complete internalization in the health care field is not always possible. Instead, the closest organizational structure to complete internalization in health care may be the integrated delivery system, which is a group of tightly

coupled, yet separate, provider and financing entities. In other words, due to the context specific legal and regulatory barriers in the health care industry that inhibit complete internalization (as discussed within TCE), it appears that more partners may prove to be a close substitute to this concept of complete internalization. Therefore, while the competitive advantage effect from many partners as proposed herein seems contradictory to TCE, in reality, the context specificity of health care allows for these proposed effects to be in line with TCE arguments.

Under the open systems concept (as discussed by Scott, 1987), organizational systems are seen as having subsystems that are only weakly connected to other subsystems and that are fairly autonomous. This interdependency between these subsystems is best managed by allowing the subsystems to be loosely coupled (as discussed by Pfeffer and Salancik, 1978). This loose coupling may lead to flexibility and adaptability regarding the relationships between the subsystems (Weick, 1976).

Flexibility and adaptability, in turn, are argued to lead to increased performance and, perhaps, to increased competitive advantage, especially in environments characterized by turbulence. This is opposite of the arguments presented herein which state that the highest level of competitive advantage is achieved when there are tightly linked relationships, not loosely coupled relationships. The context specificity of the health care industry will be used to show that the conditions assumed under the loose coupling idea do not

apply to the health care industry. This means that the proposals of this study are not constrained by and do not have to fit with the proposals espoused by the loose coupling framework.

The concept of loose coupling connotes the image of bundles of resources that can be grafted onto or taken off of a system with relatively little disturbance to either the bundles or the system. In health care, both the "local" nature of health care delivery and the concept of shared financial risk vis-à-vis managed care actually preclude health care partner organizations from harm-free shifting of allegiances (i.e., joining and dissolving partnering arrangements). For example, once a medical group has established networking relationships with other medical groups, hospitals, managed care organizations, and integrated delivery systems/networks, it would be very disruptive for the medical group to suddenly pull away from its partners and latch onto other partners. This disruption to the health care system may be due to the fact that, in the local health care market, there may not even be another medical group to step in where the first medical group left.

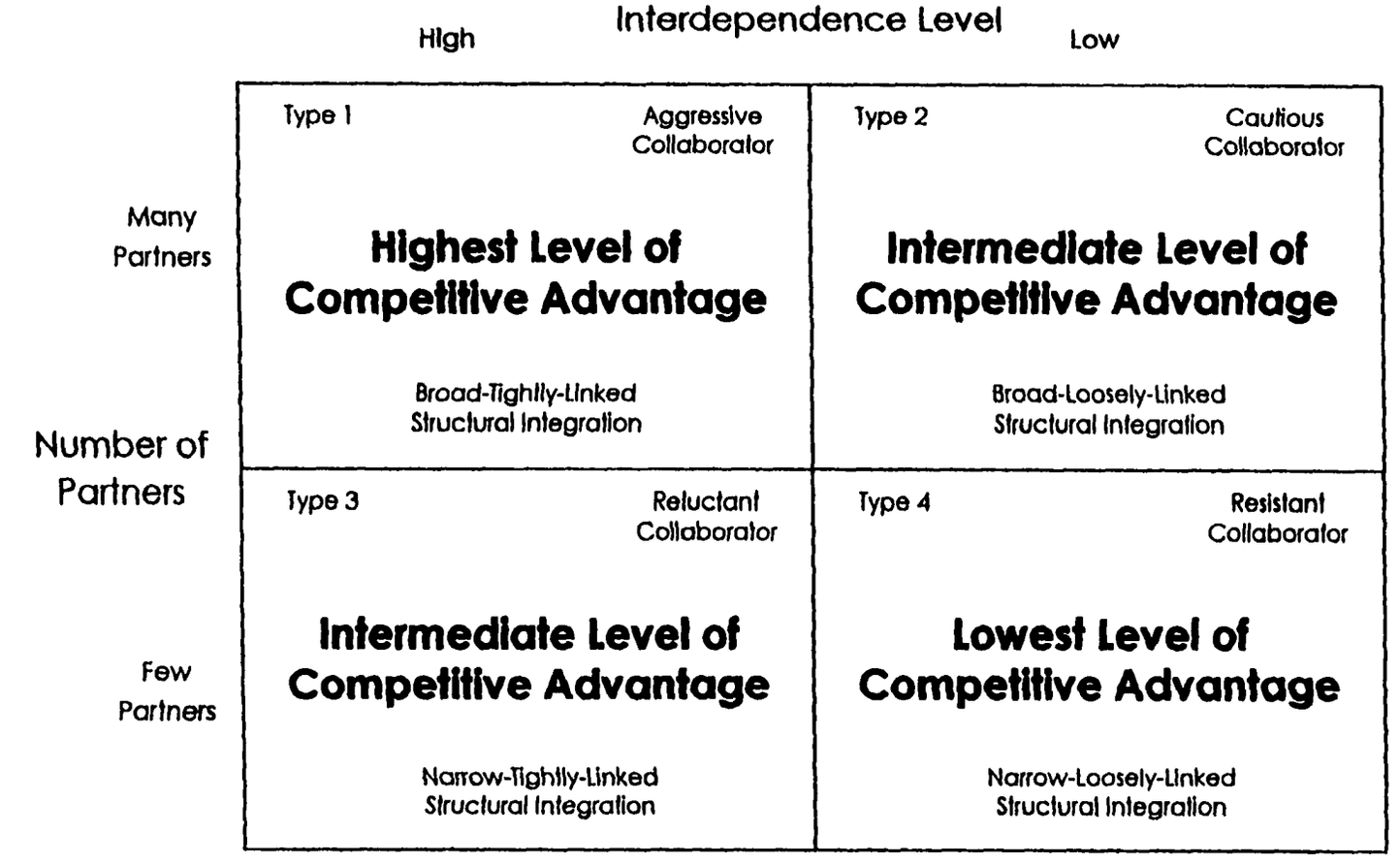
As another example, health care provider organizations are agreeing to a new form of financing of health care, capitation. Capitation implies that financial sharing of medical treatment risk by the providers and the insurance company. These types of risk sharing relationships are very all-encompassing and are generally designed from a "population of patients"

perspective, rather than from an "individual patient" perspective. In other words, health care systems are designed to provide the complete continuum of care for a defined population of patients. Partner organizations that suddenly try to drop out of a particular system will find that both they and the system suffer, perhaps irreparably.

These examples indicate that the conditions inherent in the loose coupling concept do not fit very well with the health care industry. Therefore, the proposed or descriptive arguments for loose coupling do not apply to today's health care industry and it is deemed acceptable to have competitive advantage proposals for the health care industry that do not fit the typical loose coupling situation.

Propositions. The exploratory nature of this study and this extensive discussion of how the two dimensions of number of partners and level of partner interdependence blend together leads to the determination of one proposition for each of the four ideal types of SIGs (i.e., one proposition for each cell). These four basic propositions follow and are summarized in Figure 2.3.

Proposition 3a: Organizations with *many* partners and *high* levels of partner interdependence have *higher* levels of competitive advantage.



(Logical, *a priori* types that may or may not appear in pure form among the empirically-generated types.)

Figure 2.3: Conceptual Typology of Structural Integration Groups–Competitive Advantage Implications.

Proposition 3b: Organizations with *many* partners and *low* levels of partner interdependence have *intermediate* levels of competitive advantage.

Proposition 3c: Organizations with *few* partners and *high* levels of partner interdependence have *intermediate* levels of competitive advantage.

Proposition 3d: Organizations with *few* partners and *low* levels of partner interdependence have *lower* levels of competitive advantage.

As these propositions indicate, organizations with many partners and a high level of partner interdependence have the highest level of competitive advantage. On the other hand, organizations with few partners and a low level of partner interdependence have the lowest level of competitive advantage. However, it is not as easy to predict the relative competitive advantage effects of the other two kinds of SIGs, except to say they both will lead to an intermediate level of competitive advantage.

There is no way to decide which of the two dimensions (i.e., number of partners or level of partner interdependence) has more weight when they blend together to create SIGs. Therefore, when discussing only four broad categories of SIGs, it is not possible to determine whether cautious

collaborators should have more or less competitive advantage than reluctant collaborators.

For this exploratory study then, the propositions will indicate that these two different types of SIGs will result in neither the highest nor the lowest competitive advantage. Instead, they should result in an intermediate level of competitive advantage.

Propositions Related to Research Question #4

Research question #4 asks: Are there environmental and/or organizational characteristics which predict an organization's competitive advantage?

Organizations and environments are interdependent (Scott, 1987). Organizational outcomes represent the joint product of organizational performance and environmental response. For example, in health care, a surgeon may perform flawlessly, but the patient may still die. There are external factors beyond the control of the organization. These external factors can be represented by different environmental attributes, such as the degree of threat to the organization (Blair and Fottler, 1990), the degree of resource munificence (Castrogiovanni, 1991), the degree of inter-connectedness to other organizations (Pfeffer and Salancik, 1978), etc.

In general, environmental factors that are more stable and less uncertain tend to allow for recoupment of prior investments, while

simultaneously allowing for more munificent resources. This leads to the following proposition.

Proposition 4a: Environments representing a *non-changing* operating paradigm lead to *higher* organizational competitive advantage.

Previously, organizational attributes were discussed that were defined as complex and analytical (see research question #1 propositions). Regarding organizational performance and the complex and analytical attributes, there are several organizational characteristics that have historically shown to play a critical part in organizational performance. For example, complex organizational attributes such as large size (Boyd, 1991; Miller and Cardinal, 1994) and analytical organizational attributes such as the existence of formal strategic planning processes (Boyd, 1991; Bruton et al., 1995; Miller and Cardinal, 1994) have been shown to affect organizational performance.

In the health care industry, whether or not a medical group is an academic practice plan (i.e., a highly complex and analytical organization) can affect organization performance. It has been argued that academic practice plans cannot compete on the basis of cost because their typical quasi-governmental status dictates that they must provide a teaching function (that often costs more than it brings in). This makes it difficult for academic practice plans to compete on cost alone.

In addition, these types of medical groups often see a sicker mix of patients (e.g., because of the ties they often have with county hospitals) and have inefficient practice styles (e.g., the teaching function often leads to more tests in order to train the students) (Fox and Wasserman, 1993). Thus, the following proposition is offered.

Proposition 4b: Organizational demographics characterized as *complex and analytical* lead to *higher* organizational competitive advantage.

Chapter Summary

This chapter began with a presentation of a detailed review of the relevant literature covering IORs, structural linkages of medical groups, and competitive advantage. This was followed by a presentation of a new conceptually generated typology of SIGs. Finally, several propositions tied to the research questions presented earlier and related to the newly created SIGs were then presented. The research methodology of this study is explored next.

CHAPTER III

RESEARCH METHODOLOGY

Chapter Overview

This chapter describes the research methodology of this study. This includes discussions about: (a) the data source; (b) the model, along with construct definitions; (c) the operationalization of the constructs; and (d) the analysis plan used to test the propositions.

Data Source

Data Collection. The data used in this study are a subset of data obtained from a national survey of medical group practice executives, entitled *Facing the Uncertain Future* (FUF). The FUF study was jointly conducted between the Center for Research in Ambulatory Health Care Administration (CRAHCA), the research and development arm of the Medical Group Management Association (MGMA), Englewood, Colorado, and The Institute for Management and Leadership Research (IMLR), College of Business Administration, Texas Tech University, Lubbock, Texas. Abbott Laboratories, Abbott Park, Illinois was the funding sponsor.

MGMA's professional credentialing organization, the American College of Medical Practice Executives (ACMPE), faculty of Texas Tech University's

Ph.D. and M.B.A. Programs in Health Organization Management (HOM), and faculty from the University of Alabama at Birmingham collaborated in this project.

This FUF study consisted of two distinct phases of questionnaire development and data collection. The first phase was administered in mid-1994, with respondents answering questions about 1989, 1994 and 1999. The second phase followed approximately one year later with respondents answering questions about 1995 and 2000. Each phase of questionnaire development and data collection had its own unique focus.

All the data used in this study came from the second phase FUF questionnaire, which consisted of 612 questions posed to two distinct groups of health care executives: (1) medical group practice executives (including both physician executives and non-physician executives); and (2) other health care industry executives. Respondents were requested to be informants about their own organizations, rather than to supply answers to questions about themselves. Only selected questions from the second phase FUF questionnaire were chosen for use in this paper. These selected items are shown in Appendix B.

The second phase FUF questionnaire was pilot tested in March, 1995 to identify any misunderstandings or confusion with the actual wording of the questions. Thirty medical practice executives, including both physicians and non-physicians, participated in the pilot test. No difficulties were

reported in answering any of the questions. The length of the survey, however, was identified as a potential problem. No substantive revisions were made to the questionnaire based on the pilot test because it appeared that the structure of the questionnaire presented enough information and had enough alternatives to allow the respondents to understand the issues and to provide meaningful answers to the questions.

In early-April, 1995, the second phase FUF questionnaire was sent to 3,233 health care executives. These potential respondents included all the first phase respondents plus all the members of ACMPE plus all the members of MGMA's Society for Physicians in Administration (SPA). The first phase respondents included physician and non-physician medical group executives, hospital executives, managed care organization executives, and health care industry supplier executives. The initial deadline for the return of the second phase questionnaire was May 3, 1995.

Fax reminders of the deadline were sent to all potential respondents in mid-April, 1995. A follow up mailing of the entire questionnaire packet was sent on May 3, 1995 to all non-respondents. When practical, telephone follow up was performed by MGMA. The final deadline for returning questionnaires was moved to May 12, 1995. The questionnaires were returned directly to MGMA, where the data were coded and entered under the direction of the Survey Operations department. Second phase respondents were asked to provide contact information for data quality

control procedures. Respondents were informed through the instructions that accompanied the questionnaire that their answers were guaranteed anonymity so they would be willing to share sensitive information

To ensure the protection of potential respondents from adverse effects of participating in this study, a copy of the questionnaire was submitted to the Texas Tech University Committee for the Protection of Human Subjects, Office of Research Services. This committee approved the use of the questionnaire.

Of the original second phase sample (3,233), 865 responded, resulting in a 26.8% response rate (i.e., 865 / 3,233 = 26.8%). Since this study involves an analysis of medical group practice executives, only the 686 respondents who were classified as medical group practice executives were included. A detailed profile of these 686 executives appears in the *Results and Interpretations* chapter.

Sampling Frame

This study has the organization (i.e., what is being studied) as the unit of analysis. The level of measurement (i.e., how the data was collected) is the individual respondent. The level of analysis (i.e., the testing level) is the organization and the level of reference (i.e., who or what to generalize to) is also the organization.

The sampling frame (i.e., the decomposition from the theoretical population to the sample selected) is shown in Table 3.1. The theoretic population for this study is all medical group practices. However, given the political realties of different countries, and given that the structural linkages discussed in this study are especially timely in today's U.S. health care industry, the population of reality is all U.S. medical group practices. However, due to constraints such as budgets and choice of partner for the FUF study (i.e., MGMA with its available membership), the operationalized population is all U.S. medical group practices who are also members of MGMA. The sample selected for this study was defined earlier as all the members of MGMA's ACMPE plus all the members of MGMA's Society for Physicians in Administration (SPA).

The U.S. health care industry has approximately 20,000 medical groups representing about 200,000 physicians (Medical Group Management Association Annual Report, 1996). Medical groups are defined as those medical practices which have three or more full-time equivalent physicians.

Medical group executives were selected for participation in this study from the membership of the Medical Group Management Association (MGMA), a professional organization with 18,000 physician and non-physician members representing approximately 7,000 of the aforementioned 20,000 U.S. medical groups. Specifically, this study's sample of 3,233 came from those MGMA members who belonged to two divisions within MGMA:

Table 3.1

Sampling Frame

Element	Population or Sample Quantity (i.e., "n")
Theoretical Population:	
All medical group practices in the world.	20,000+
Population of Reality:	
All U.S. medical group practices.	appox. 20,000
Operationalized Population:	
All U.S. medical group practices who are MGMA members.	approx. 7,000
Sampled Selected:	
All U.S. medical group practices who are MGMA members and who specifically belong to ACMPE and/or SPA.	3,233
Sample Used:	686
Physician and non-physician executives of all U.S. medical group practices who are MGMA members and who specifically belong to ACMPE and/or SPA.	

the American College of Medical Practice Executives and the Society for Physicians in Administration.

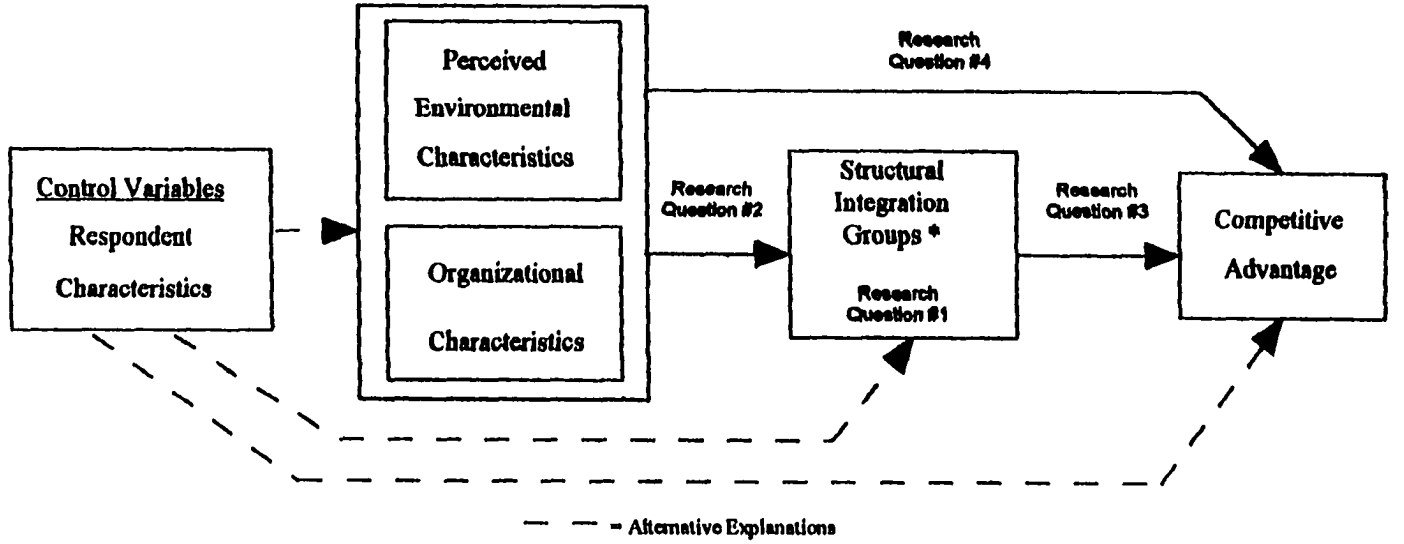
Model and Construct Definitions

The overall model of this study is shown as Figure 3.1. This model shows three types of constructs: (1) the dependent variable; (2) independent variables; and (3) control variables. The dependent variable is competitive advantage. The independent variables include: structural integration groups (SIGs), environmental characteristics; and organizational characteristics. The control variables include respondent characteristics.

This model indicates that four specific research questions will be examined. These are labeled near each relationship and will be discussed after the definitions of the constructs are presented. The expected direction of each of the relationships is indicated by the arrow at the right end of each relationship line. Also shown in this figure are three dotted lines that represent the alternative explanations possible from the control variables.

Constructs and Individual Indicants

The constructs developed for this study were guided by existing theory and research. While several constructs are multi-item scales, Appendix B shows the actual questionnaire questions used to gather information on each individual indicant. The indicant names used in Appendix B are interpreted



* Structural Integration Groups are Based on the Quantity of Partners and the Level of Interdependence of the Relationships

Research Question #1: Do SIGs exist and, if so, what do they look like?

Research Question #2: Are there environmental and/or organizational characteristics which predict an organization's membership in specific SIGs?

Research Question #3: Does membership in SIGs lead to organizational competitive advantage?

Research Question #4: Are there environmental and/or organizational characteristics which predict an organization's competitive advantage?

Figure 3.1: Structural Integration Groups and Competitive Advantage.

in the following manner: "P1Q5" is read as "Part 1, Question 5." "Part" refers to the distinct section in the questionnaire.

The individual indicants that make up the constructs are described in the next sections within the discussion of the constructs themselves. They are shown on Figure 3.2, which illustrates how the individual indicants relate to each other. This figure parallels the model presented in Figure 3.1.

Operationalization of Competitive Advantage

The study's dependent variable is competitive advantage. An important aspect of measuring competitive advantage is that it must be measured relative to competitors, and is often used with phrases such as "better than" or "worse than."

There are seven different competitive advantage measures used in this study. The first is a mean of the six indicants of: (1) clinical quality (i.e., the quality associated with the outcomes of the actual clinical procedures performed by physicians, technicians, and nurses); (2) service orientation (the propensity of the staff to be helpful, considerate, and cooperative toward the patient and other stakeholders (O'Connor and Shewchuk, 1995)); (3) market share; (4) profitability; (5) cost effectiveness; and (6) organizational survival. The six individual indicants are also used separately as six different measures of competitive advantage.

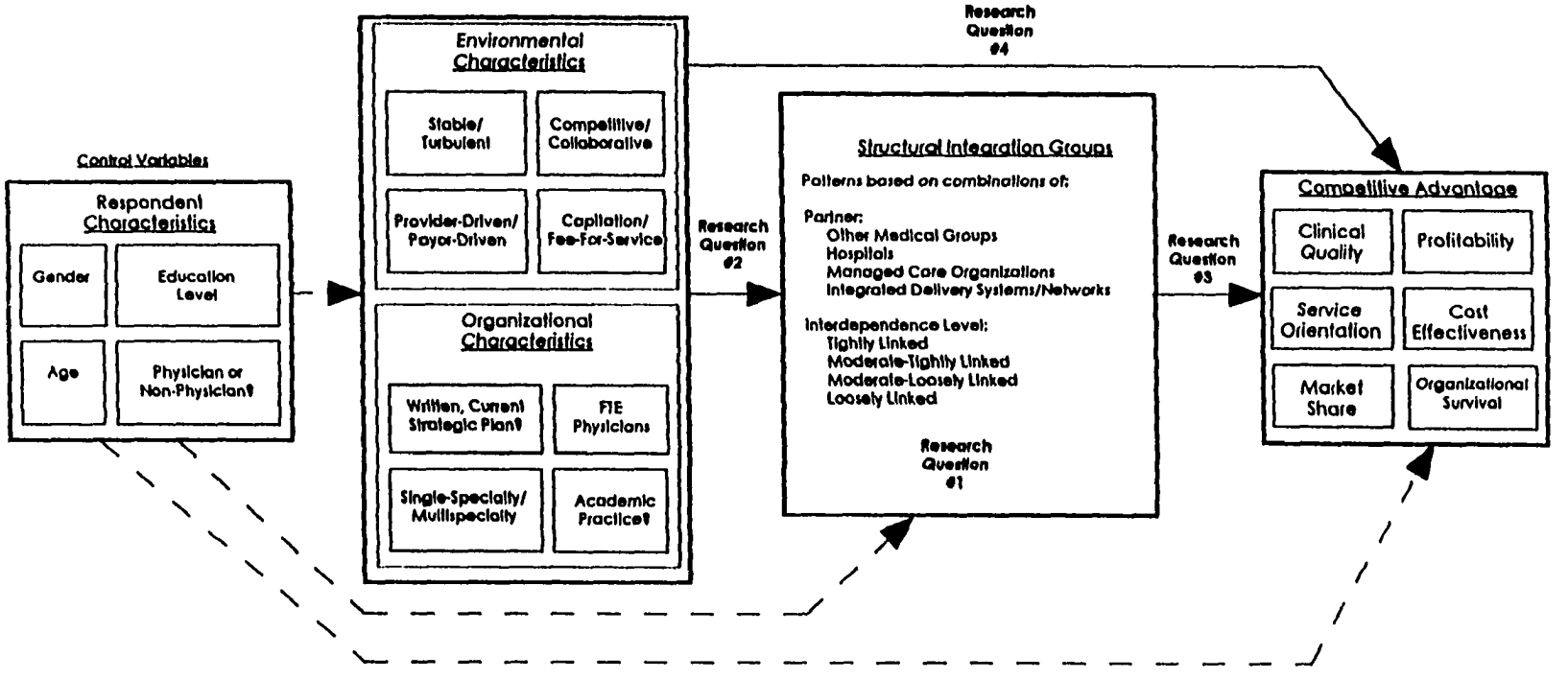


Figure 3.2: Structural Integration Groups and Competitive Advantage-Individual Indicants

Each of the six indicants is a performance goal and is measured with the same five-point scale, as shown in Appendix B. A score of "1" represents a situation where the respondent believes his/her organization is much worse than its local competitors in achieving the goal. A score of "3" indicates the situation where the respondent believes that his/her organization achieves the goal the same as its local competitors. A score of "5" represents a situation where the respondent believes his/her organization is much better than its local competitors in achieving the particular goal. These six competitive advantage indicants are discussed next.

Competitive Advantage Indicants

Clinical Quality (P4BQ1). This is the quality associated with the outcomes of the actual clinical procedures performed by physicians, technicians, and nurses. Health care organizations have always had to be concerned with clinical quality. However, in this new era of managed care, with its associated issues of credentialing and selective participation in managed care organizations, quality of clinical outcomes is vitally important. In addition, the topic of total quality management is a very common research topic in the health care literature.

Service Orientation (P4BQ2). Service is a term used to represent the medical group's overall approach to patients and other key stakeholders. O'Connor and Shewchuk (1995) define it as the propensity to be helpful,

considerate, and cooperative. It is the set of attitudes and behaviors that affect the quality of the interaction between employees and the organization's customers (i.e., patients) and important stakeholders. A possible reason for interest in service orientation includes a preoccupation with patient perceptions of service quality, such as length of time spent in the waiting room (i.e., the queuing time), the aesthetics of the medical office, and attitudes of the nursing staff. It is often said that, from the patient's point of view, service orientation is often the sole criterion used for making judgments about whether the physician is "good."

Market Share (P4BQ3). Health care has traditionally had a local market. The product (i.e., the clinical procedure) is produced and consumed in a relatively small geographic area. While there are some organizations that are world famous and attract patients from all over the world, the majority of health care delivery can be considered a local phenomenon. Market share is, therefore, a vital statistic to track because any given health care market is a basically a fixed pie (at least for the "average" patient encounter).

Profitability (P4BQ4). Much of the research on strategic effectiveness includes some type of profitability measure. Profits are assumed to be necessary to sustain the ongoing operations of all entities, whether for profit or not-for-profit. Therefore, profitability is appropriate to include in an overall analysis of competitive advantage to ascertain if the organization is out-performing its competitors.

Cost Effectiveness (P4BQ5). In health care today, the controlling of costs is of paramount importance. The advent of capitation by payers has placed a cap on the total amount of revenue health care providers can expect to receive for a given population of patients. This means that the only ways for cash flow to be increased or kept in the organization are to either increase health plan members and/or reduce costs. While marketing efforts are attempting to lure patients into specific health plans, provider organizations must be proactive in reducing costs (or at least in reducing the rate of increase of costs).

Organizational Survival (P4BQ6). The ultimate goal of any organization is to survive. In health care, survival represents a gain to both the organization, itself, but also to society as a whole. There are many instances of geographically rural areas in the U.S. that have no physician, no hospital, not even a nurse. The survivability of health care organizations is of utmost importance to the health policy of the entire country.

Operationalization of Structural Integration Groups

The SIG construct is a multi-item scale composed of fifteen individual items. Each of these individual items is a dichotomous measure. The actual questionnaire questions that were asked of the respondents for these structural linkage items are shown in Appendix B. Each respondent was requested to check a box if the respondent believed his/her organization had

the specific structural linkage. If the respondent did not check the box, the respondent was indicating that his/her organization did not have that particular structural linkage.

All of the fifteen individual items have two components: type of partner organization and level of partner interdependence. Type of partner organization indicates which of the following kinds of organizations are partners of the respondents' medical groups: (1) other medical groups; (2) hospitals; (3) managed care organizations; and (4) integrated delivery systems/networks. Given the prevalence of structural linkages in today's health care industry, it is important to have an understanding of the types of organizations with which medical groups are collaborating. Figure 3.3 shows how the individual items relate to the four distinct partners of medical groups. The double-headed lines emanating from and leading to the middle box called "Medical Group" represent these potential partnering relationships.

Medical groups can become involved in the following four different levels of partner interdependence: (1) tightly linked; (2) moderate-tightly linked; (3) moderate-loosely linked; and (4) loosely linked. The health care industry is going through a period in which an unprecedented amount of collaborative activity is taking place. However, collaborative actions can range all the way from rather loosely linked actions like the traditional

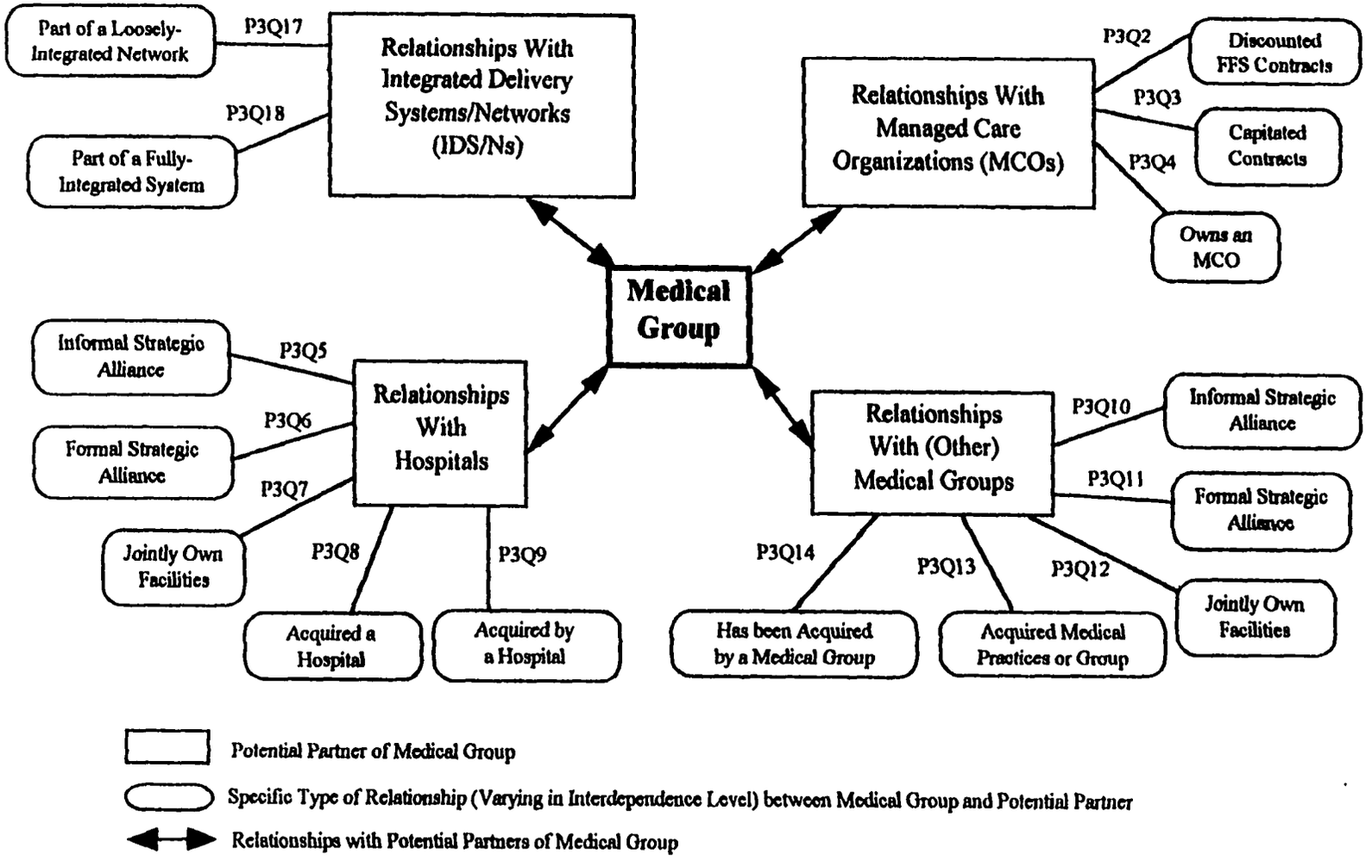


Figure 3.3: Structural Linkages of Medical Groups—Potential Partners

referral patterns between different groups of specialized physicians, to the relatively tightly linked activities of acquisitions and networks.

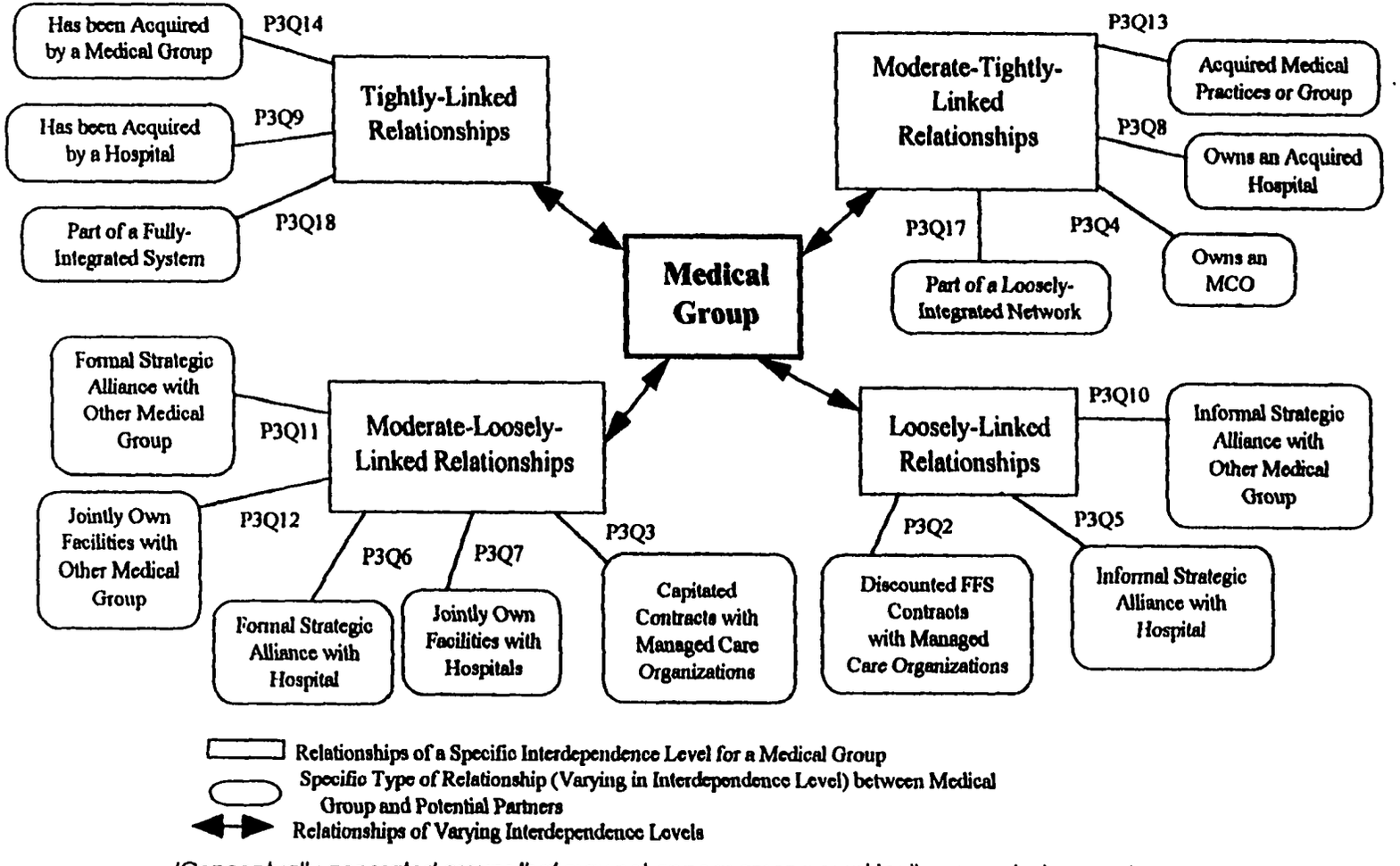
Therefore, an understanding of the level of partner interdependence of the collaborative activities of medical groups should add important information to the field of health care research. Each of these different levels of partner interdependence brings with it issues that need to be understood in any collaboration effort, such as level of financial commitment, governance issues, power changes, and regulatory issues (Duncan et al., 1995).

Figure 3.4 shows conceptually how the survey's fifteen individual items relate to the four distinct levels of partner interdependence. The double-headed lines emanating from and leading to the middle box called "Medical Group" represent these potential interdependence levels that the medical group could be engaged in.

A discussion explaining each of the fifteen individual items (grouped by type of partner) follows.

Structural Linkages—Other Medical Groups

Informal Strategic Alliance with Other Medical Group (P3Q10). These types of alliances between the respondent's medical group and another medical group would represent very little commitment on the part of either party. An example of this type of relationship would be the traditional



(Conceptually-generated groups that may not appear among empirically-generated groups.)

Figure 3.4: Structural Linkages of Medical Groups—Interdependence Level.

physician referral networks. In geographic areas where managed care has not yet gained a substantial foothold, these types of relationships may still be quite common.

Formal Strategic Alliance with Other Medical Group (P3Q11). This structural linkage between the respondent's medical group and another medical group represents a formal relationship entered into by the parties for the express purpose of achieving a specific goal, such as sharing of expensive equipment or managed care contracting. An example of this type of structural linkage would be the formation of a group practice without walls (GPWW; described earlier). This arrangement allows each partner to remain autonomous and in separate medical facilities, but allows the individual groups to share billing and other routine tasks.

Jointly Owns Facilities with Other Medical Group (P3Q12). This type of structural linkage represents a somewhat significant commitment on the parts of both partners. An example of this type of structural linkage is when two medical groups jointly invest in a freestanding specialty clinic, such as a surgi-center. In order to share financial investment in facilities, each medical group must believe it will be better off by sharing than by owning the facilities individually. This may be, for example, when the facilities cost so much to build that it would be prohibitively expensive for one group to attempt by itself.

Acquired Other Medical Group (P3Q13). This structural linkage occurs when the respondent's organization has the resources and the reasons to actually buy another medical practice. Acquiring another medical practice may be necessary, for example, in order for the medical group to quickly add the particular medical specialty it is acquiring so that the medical group can bid on a managed care contract.

Acquired by Other Medical Group (P3Q14). While this sounds similar to the above measurement item, there are very distinct differences, especially from the point of view of the respondent's medical group. In this case, the respondent's medical group is the acquired organization. As such, there will be significant acquisition issues that will need to be resolved, such as cultural change, operational differences, whether to retain all the acquired physicians, etc. This type of structural linkage may mean the respondent's organization ceases to exist.

Structural Linkages—Hospitals

Informal Strategic Alliance with Hospital (P3Q5). Years ago, these informal structural linkages were the major type of relationship between medical groups and hospitals. These occurred in the traditional "hospital privilege" relationship, wherein the physician was granted uncredentialed admitting privileges to a hospital. Both the physician and the hospital

enjoyed benefits from this relationship. The hospital gained from an increase in the use of its facilities and the physician was able to use equipment that may have been prohibitively expensive for the physician to purchase.

Formal Strategic Alliance with Hospital (P3Q6). In the last few years, this type of structural linkage has increased dramatically. An example would be when hospitals set up a management service bureau (MSB) to perform the administrative tasks (e.g. billing) of the medical practice. The hospital generally acts as a supplier to the medical group in these formal strategic alliances.

Jointly Owns Facilities with Hospital (P3Q7). These structural linkages have traditionally been called management service organizations (PHOs). These types of arrangements typically include joint strategic planning activities in order to evaluate if both parties will benefit from joint ownership of facilities. Often, the ownership of joint facilities includes assets from both the medical group and the hospital being purchased by the MSO. There is a usually a moderate degree of interdependence between the hospital and the medical group.

Owns an Acquired Hospital (P3Q8). This is the ultimate physician-hospital organization (PHO), at least from the physicians' point of view. Physicians acquire hospitals for several reasons, including to control both the outpatient and inpatient care for its patients, and because the physicians have a desire to integrate and the hospital management does not share that

desire. Examples of this type of structural linkage include Marshfield Clinic (Wisconsin) and the Mayo Clinic.

Acquired by a Hospital (P3Q9). This is the situation where the physicians become employees of the hospital. This structural linkage is much more common than when medical groups acquire a hospital. The clinic ownership organization is an example of this type of relationship. This allows the hospital to control both the clinical and administrative sides of health care delivery. There are some inherent problems with this type of acquisition. For example, physician employees have typically been very hard to manage from the hospital's point of view. This is probably due to the power the physician still wields, even as an employee, regarding the best course of treatment for each individual patient. In addition, it has been argued that physicians do not respond well to subordinate roles, even when another physician is the supervisor.

Structural Linkages—Managed Care Organizations

Discounted Fee-For-Service Contracts with MCOs (P3Q2). These are the types of contracts that were introduced during what has been called the first generation of managed care (i.e., the 1970s, per Duncan et al., 1995), when primary care physician gatekeepers, utilization review, and second opinions became a very critical part of health care financing payment plans.

Discounted fee-for-service contracts are still prevalent in geographic areas that do not have a strong influence of managed care.

Capitated Contracts with MCOs (P3Q3). This is the type of payment mechanism used in the latest managed care contracts written in the most highly developed managed care markets, those . These are in the third generation (i.e., the 1990s, per Duncan et al., 1995) of the managed care evolutionary stage. Capitated contracts involve risk sharing between health care providers and health care financing organizations. Capitation encourages the focus of health care to be on preventive medicine.

Owns an MCO (P3Q4). The medical group that owns a managed care organization is likely to be one that understands the base concepts of capitation (i.e., providing health care for a given patient population for a fixed revenue stream). Medical groups that own a managed care organization are likely to be leaders in integration efforts.

Structural Linkages—Integrated Delivery Systems/Networks

Part of Fully Integrated Delivery System (P3Q18). As discussed in the literature review, fully integrated delivery systems have been created in response to the hyperturbulent environment of health care. These comprehensive provider and financing organizations are intended to provide the complete continuum of care for a defined patient population. Fully

integrated delivery systems also include some form of overarching governance structure to ensure that each of the component organizations (i.e., medical groups, hospitals, and managed care organizations, at a minimum) functions with the overall integrated delivery system's well being in mind. As such, these systems represent the ultimate organizational structure in health care, whether the criterion is based on the partner to a medical group or the level of interdependence for the partner medical group.

Part of Loosely Integrated Delivery Network (P3Q17). These integrated delivery organizations have the same goals as fully integrated systems; however, loosely integrated networks do not have as much interdependence between the partners. While the interdependence level is still quite high, the absence of ether an overarching governance structure or the ability to enforce a weak, yet existing, governance structure, allows for much greater freedom for the component organizations.

Operationalization of Environmental Characteristics

There are four individual items that measure the general health care environment. Each of these items is intended as a proxy for some part of the current health care environment. These items give an indication of how the respondents perceived the environment in which their specific organizations operate. Each of the four environmental items used a seven-point semantic differential scale, ranging from "1" to "7." For each item, only the two

endpoints (i.e., 1 and 7) have labels. The actual questionnaire questions used to measure these five items are shown in Appendix B and are described next.

Environmental Indicants

Stable versus Turbulent (P9Q1). This measure tells us whether the respondents believe the environment is more stable and predictable or whether the environment is characterized by turbulence and changes. Research has shown that the more turbulent the environment, the more likely organizations are to collaborate. They work with each other to attempt to reduce the uncertainty they feel in all the turbulence.

Competitive versus Collaborative (P9Q2). An environment that is described by the respondents as being collaborative, as opposed to competitive, implies that organizations are working together to accomplish goals, rather than attempting to cause other organizations to cease to exist. This measure does not imply that competition and collaboration cannot co-exist. Rather, it is an indicator of the overarching perspective that the respondents have regarding whether collaboration is expected and accepted within their particular environment.

Provider-Driven versus Payor-Driven (P9Q5). Health care used to be exclusively provider-driven. Both medical groups (i.e., the physicians) and hospitals made decisions involving clinical treatment, equipment investments, research and development expenditures, etc. based on criteria that were often not always cost-based. For example, when one hospital in a

given locale purchased a piece of high technology equipment, often, all the other hospitals purchased the same thing very soon afterward. These purchase decisions were not driven so much by cost analyses as they were by reputation and one-ups-man-ship.

When the environment is payor-driven, as today's new third generation of managed care (per Duncan et al., 1995) is moving us toward, health care is not practiced the same way. Both clinical treatment autonomy and equipment expenditures are subject to such evaluation techniques as prescribed treatment plans and justification of purchases. This loss of provider autonomy is a very marked change in the delivery of health care.

Capitation versus Fee-For-Service (P9Q7). As discussed earlier, fee-for-service is the traditional manner of financing health care services. However, capitation is the new way of doing business. This form of payment requires that the two major components of health care (i.e., clinical service and financing) share in the risk of treating a defined patient population. This capitation process involves the providers in the cost issues of health care and can dramatically alter the way health care is delivered.

Summary of Environmental Characteristics. All of these environmental characteristics will be described in this study based on only one of the two dimensions of the semantic differential. The dimension that most clearly represents the new paradigm for health care will be the descriptive dimension. For example, one indicant measures stability versus

turbulence. The environmental characteristic identified by this variable will be turbulence, since that is the newer paradigm within health care. The other characteristics that represent a new environmental paradigm are collaboration, payor-driven, and capitation.

It is always desirable to have higher values of a variable represent the measured characteristic. This is the case for turbulence, collaboration, and payor-driven. However, as seen on the previously mentioned Appendix B, capitation is measured on the lower end of the value continuum. Therefore, this particular indicant will be reverse coded (i.e., a 1 becomes a 7, a 2 becomes a 6, etc.) so that higher values represent more capitation. This makes statistical analysis more intuitive and consistently interpretable.

Operationalization of Organizational Characteristics

There are four individual items that measure characteristics of the respondent's medical groups. They are demographic in nature and, therefore, were measured in a variety of ways. Appendix B shows the actual questionnaire questions that were used. Together, these items provide an overall picture of the respondents' medical groups. They are described next.

Organizational Indicants

Existence of a Strategic Plan (P1Q11). This item indicates if the respondent believes that his/her medical group has a current, written

strategic plan. It is assumed that those organizations that did have a strategic plan would be aware of the environmental conditions of the health care industry and would also be practicing the latest strategic techniques and tactics available in the health care industry (Bruton et al., 1995). Strategic planning has been shown to affect performance of organizations (Miller and Cardinal, 1994; Boyd, 1991).

This measure is a dichotomous variable. Each respondent was asked to check a box if his/her medical group had a current, written strategic plan. If the box was not checked, the respondent was indicating that the organization did not have one.

Number of Full-Time Equivalent Physicians (P1Q13). This item was asked to ascertain if the medical group would be considered a small, medium, or large medical group. Per MGMA, small medical groups are those that have 10 or fewer FTE physicians. Large medical groups are those that have at least 50 FTE physicians. Medium size medical groups are those in between 11-49 FTE physicians, inclusive. This particular measure is a continuous variable.

The size of the medical group is important because it is assumed that small medical groups would be more inclined to stay small in order to preserve autonomy. However, in this current health care environment, these small groups are not expected to perform as well as the medium and large medical groups. Large medical groups are typically associated with academic

organizations. However, in this sample, the largest medical groups are evenly split between academic practices and non-academic plans. Therefore, the larger the medical group, the better the competitive advantage.

Single Specialty or Multispecialty (P1Q14). This variable indicates the respondent's beliefs regarding the type of medical practice (multispecialty with primary care, multispecialty without primary care, or single specialty) that best fits the respondent's organization. Population ecology theory (Hannan and Freeman, 1977) argues that single specialty medical groups (i.e., interpreted as specialized organizations per population ecology theory) will be more anxious in this uncertain health care environment. As such, they may be more likely to see collaborative actions (i.e., interpreted as generalized organizations per population ecology theory) as beneficial, and may be more likely to engage in them when compared to multispecialty groups. One item was used to measure this variable. It is a check-off variable. This specific measure of organization type is reduced to only two categories (multispecialty and non-multispecialty).

Medical School-Based Academic Practice (P1Q15). Academic practice plans are unique medical providers. They are typically very large multispecialty groups, which are often associated with the teaching function at medical school. They are, therefore, operated like quasi-governmental organizations. They often have higher costs than other large medical groups

because of the teaching and research functions they perform (Fox and Wasserman, 1993).

However, academic practice plans also have unique competitive advantages, often the very same reasons why they are not cost effective medical care providers. Some of this potential competitive advantage comes from (Zuckerman, 1993): extremely focused faculty expertise; multidisciplinary treatment capabilities; access to costly and state-of-the-art technology; and the ability to offer the latest medical products and procedures.

This measure is a dichotomous variable. Each respondent was asked to check if his/her medical group was an academic practice plan. If the "Yes" box was checked, the respondent was indicating that his/her organization was, indeed, an academic practice plan. If the "No" box was checked, instead, the respondent was indicating that the organization was not one. If neither box was checked, the data were entered as missing data.

Operationalization of Respondent Characteristics

The control variables can be classified as respondent characteristics. These specific indicants may be alternative explanations of the dependent variable (i.e., competitive advantage) or they may influence the strength and/or direction of the actual effect the independent variables (i.e., SIGs,

environmental characteristics, and organizational characteristics) have on the dependent variable.

There are three individual items that are used to ascertain four different characteristics of the respondents. These four respondent items are demographic in nature. As such, they were measured in a variety of ways. Appendix B shows the actual questionnaire questions that were used for these individual items. They are described next.

Respondent Indicants

Gender (P1Q1). This item will be used to ascertain if there are systematic differences in the way males and females responded to the questions presented in the FUF questionnaire. Analysis of this item will indicate if gender bias is present.

Age (P1Q2). This item will allow for analysis of any age bias present in the responses to the questions used in the FUF questionnaire. It is assumed that the age of a respondent may affect the types of answers given by respondents. For example, older respondents are presumed to have more life experiences and are, therefore, expected to be more conservative in their assessments of courses of action to take. In other words, older respondents may be less likely to desire to engage in collaborative efforts, especially since, until very recently, the industry was not very concerned with collaboration. This measure is a continuous variable.

Highest Level of Education (P1Q3). This measure indicates the highest level of formal education attained by the respondent. It is assumed education level can affect competitive advantage because greater education translates into greater knowledge. This allows better educated respondents to understand their organizations' competitive positions and actions. When this increased knowledge is coupled with the strong push in health care to collaborate, it may be that better educated respondents will be more likely to enter into integration relationships.

The possible exception to this reasoning involves physicians. Physicians, while among the most educated, may not be as interested in collaboration as non-physician due to the loss of autonomy believed to be associated with collaborative actions.

Physician Executive or Non-Physician Executive. This measure identifies whether the respondent is a physician executive (PE) or a non-physician executive (i.e., medical practice executive or MPE). The item indicating highest level of education was used to indicate if the respondent was a physician or a medical practice executive (described above). The doctoral category in "Highest Level of Education" was examined to determine those doctoral holding respondents who held medical degrees. Specifically, those respondents who possessed either a Medical Doctor degree (i.e., MD) or a Doctor of Osteopathy degree (i.e., DO) were classified as physician executives (i.e., PE). If the respondent did not possess either an MD degree

or a DO degree, than the respondent was classified as a medical practice executive.

This item is included in this study because it has been suggested that the differing formal training received by physicians and non-physicians should result in different perceptions of actual and projected business conditions. It has been shown that there may not really be substantive differences in the way these two groups perceive certain health care issues (Paolino, Greaves, Blair, Fottler, and Rotarius, 1995). However, competitive advantage was not analyzed in their study. Therefore, an important use of this item will be to determine whether there are any substantive differences in the way physicians and non-physicians see competitive advantage vis-à-vis structural linkages.

Analysis Methods and Statistical Procedures

This study is an exploratory, secondary analysis of existing cross-sectional data. While the data may seem to be relatively closely suited to this study, it was collected without the specifics of this study in mind. In other words, this is a post hoc study. The data collection involved use of a nomothetic, non-experimental approach (i.e., a questionnaire to gather the data). SPSS 6.1 for Windows is used for all data analysis. The specific analysis techniques to be used in this study are discussed next.

Methodology

Correlation Analyses. Correlations between pairs of variables will be used to assess multicollinearity, or highly correlated variables. If multicollinearity is shown to exists between any pair of variables, then one of the two variables will be considered for elimination from the study. The determination of which of two variables to leave in and which to delete from the analysis does not rely exclusively on theoretical and/or empirical issues. Instead, judgment, based on a thorough understanding of substantive health care issues, must be utilized in this step. Pearson's correlation coefficient (SPSS 6.1 Bivariate Correlations) is used to determine if multicollinearity exists between variables.

Ensure Reliable Multi-Item Scales. Multi-item scales will be developed for several of the constructs. of competitive advantage and SIGs. The reliability of each multi-item scale is assessed using Cronbach's coefficient alpha (SPSS 6.1 Scale Reliability).

Data Reduction. These techniques are utilized to create a parsimonious construct from a larger set of indicants. Both factor analysis techniques, along with their associated rotation procedures, (SPSS 6.1 Factor Analysis) and clustering techniques (SPSS 6.1 K-Means Cluster Analysis) will be used to decide if constructs parsimoniously represent indicants (i.e., unidimensionality).

Factor analysis techniques, in general, are data reduction procedures that help us understand measurement issues. Factor analysis converts raw

data into a parsimonious and more abstract form that can be efficiently used in testing propositions.

Clustering techniques will be used to create empirically generated grouping. Cluster analysis is a statistical procedure that creates mutually exclusive categorizations of data based on theoretically indicants. Cluster analysis seeks to simultaneously maximize within group similarity and maximize between group differences. This statistical procedure essentially results in a determination of several different patterns of responses that are similar enough to each other to be grouped together.

Variable Interaction. Regression (SPSS 6.1 Linear Regression), analysis of variance (SPSS 6.1 General Factorial ANOVA), and multivariate analysis of variance (SPSS 6.1 MANOVA) statistical procedures will be used to test how the variables (dependent, independent, and control) interact. In addition, tests to determine if regression assumptions (i.e., linearity, variance equality, and normality) have been violated will be performed. If necessary, the data will be transformed to correct for violations of regression assumptions. The specific details of regression follow.

Multiple regression variables can be entered into and/or removed from the regression equation either simultaneously or in a hierarchical fashion. The hierarchical methods can be one of three different avenues: forward; backward; or stepwise.

In forward hierarchical regression, variables are entered one at a time or one block of variables at a time based on a predetermined entry criterion (e.g., the satisfaction of a particular significance value). In backward hierarchical regression, the model begins with the inclusion of all variables and eliminates variables one at a time or one block of variables at a time based on a predetermined removal criterion.

Stepwise hierarchical regression combines both forward and backward regression. Variables are examined one at a time or in blocks for inclusion, then they are examined for elimination when the next variable or block of variables is examined for entry. All of these hierarchical regression methods allow the researcher to examine particular variables of interest, while holding all the other variables statistically constant. This amounts to a situation where the effects of the previously entered variables can be distinguished from the effects of the current variables being entered or removed.

For all of the regression equations in this study, missing values will be replaced with the mean of the variable across all other cases. This allows for the maximum number of cases to be included in the statistical analyses. Other statistical tests will also presented in the regression output. For example, a beta value is given for each variable. This beta value represents the standardized regression coefficient and allows for better interpretation of the strength of each variable vis-à-vis the dependent variable. Standardized

variables remove the interpretation problems associated with variables being measured in different units.

Regression procedures are intended for use with data that fit various assumptions, such as linearity, variance equality, and normality. The linearity assumption is that the residuals (i.e., difference between predicted and observed values) are presumed to be represented by a linear function. This will be visually tested using a scatterplot of standardized residuals plotted against the standardized predicted values of the dependent variable. Specifically, the plotted points show no discernible pattern in order to indicate linearity.

The equality of variance assumption states that the residuals must be equal or constant regardless of the actual predicted or observed values. This will be visually tested using a scatterplot of the standardized residuals plotted against the standardized predicted values of the dependent variable. For the variance equality assumption to be satisfied, the plotted points should be equally represented above and below the line representing the mean of the residuals and the points should be evenly spread along the predicted values.

The normality assumptions states that the residuals should be from a normal distribution. A visual test of this assumption will involve examining a histogram of the standardized residuals and looking for an approximately

normal curve. If a normal curve represents the residuals, than the normality assumption is satisfied.

Since data will never perfectly meet all the assumptions (Norusis, 1994; Norman and Streiner, 1986), closeness counts. In other words, the higher the degree of fit with all of the assumptions, the more value one can discern from the data and the more one can rely on the statistics generated from regression procedures.

ANOVA and MANOVA procedures allow for analysis of interaction effects. Both regression and the two analysis of variance procedures provide analysis of variance significance tests through the use of the F statistic (Norusis, 1994). The F statistic is the ratio between two independent estimates of a population, variability of the observations within a group (i.e., the variability of the observations around their group mean) and the variability between the group means. The within group variance measures how much the observations within each group vary. The between group variance measures how much the group means vary among themselves.

The more closely the two means resemble each other, the closer the F statistic will be to one, thus indicating statistical homogeneity. The greater the F statistic, the less likely the observed statistical differences are due to sampling error, and the more likely the differences are due to a treatment factor (i.e., the combined effects of all of the independent variables).

In addition to the F statistic, a t test is also performed. This statistical test indicates whether a specific variable has a significant relationship with the dependent variable. The t test assumes the effects of the other independent variables are held statistically constant.

A statistic representing the coefficient of determination (R^2) is also provided by these statistical procedures. This statistic is a measure of the goodness of fit of a particular model. It tells how much of the variability of the dependent is accounted for by the variables in the regression. The adjusted R^2 statistic attempts to correct R^2 to more closely reflect the goodness of fit. Adjusted R^2 reduces R^2 because R^2 is based on the sample data, and population data seldom fit the regression line as well as sample data.

ANOVA only allows for analysis of the independent variable(s) on one dependent variable. MANOVA, however, allows for analysis of multiple dependent variables. In order to ascertain which of the multiple dependent variables are most greatly affected by each of the independent variables, discriminant analysis (SPSS 6.1 Discriminant Analysis) will be performed.

Chapter Summary

This chapter first presented the data collection process and sampling frame. This was followed by a discussion of the model to be tested, including definitions of the model constructs. Next, the individual indicants were

presented, along with the operationalization of the constructs. Finally, the analysis methods used in this study were presented.

The next chapter describes the results of the measurement of the constructs, along with the results and interpretations of the proposition tests.

CHAPTER IV

RESULTS AND INTERPRETATIONS

Chapter Overview

This primary focus of this chapter is to discuss all of the data analysis, leading up to and including the testing of the propositions. First, the chapter begins with a discussion of descriptive statistics of selected indicants used in this study. Generalizability issues relating to the sample are also discussed. This is followed by the measurement of the dependent variable of competitive advantage.

Next, the propositions from research question #1 are tested. These relate to the major independent variable of structural integration groups (SIGs). The chapter then continues with an analysis of multicollinearity of the independent variables, which is followed by a presentation of the expected relationships between all the variables in the model. Finally, this chapter closes with discussions of the results and interpretations of the tests of the propositions from research questions #2, #3, and #4.

Descriptive Statistics and Generalizability

Descriptive statistics for each of the variables are presented on Table 4.1. This data summary is presented in categorical form, even though most of the variables are not categorical. These descriptive statistics provide an

Table 4.1

Descriptive Statistics

Characteristics of Respondents		#	%
Gender	Female	323	47%
	Male	363	53%
Age	29 & under	9	1%
	30-39	140	20%
	40-49	342	50%
	50-59	166	24%
	60 & over	28	4%
Highest Level of Education	Doctoral degree	93	14%
	Masters degree	348	51%
	Bachelors/High School	243	35%
Physician Executive?	Yes	75	11%
	No	609	89%
Characteristics of Respondents' Organizations			
Current, Written Strategic Plan?	Yes	402	59%
	No	279	41%
FTE Physicians	Less than 10	281	41%
	10-50	234	34%
	Over 50	171	25%
Medical Group Type	Multispecialty	334	49%
	Single-specialty	345	51%
Academic Practice?	Yes	102	15%
	No	579	85%

overview of the nature of the data. This information will facilitate interpretation of the results of the tests performed in this chapter.

How representative is this study's sample vis-à-vis the population of reality (i.e., all U.S. medical group practices)? Members of MGMA (which numbered approximately 19,000 in 1995) may be more likely to be proactive regarding strategic threats such as health care reform because their membership in a professional association indicates their yearning for solutions to the problems they face.

In addition, those MGMA members who belong to MGMA's professional credentialing entity, ACMPE, are most likely the furthest along the "health care" education dimension, especially compared to the medical group executives who are not even regular members of MGMA (and, therefore, do not even receive the monthly journal of MGMA).

Data was available from MGMA for five variables that represent two respondent characteristics and three organizational demographics. The results of t-tests for these five variables indicates that there may not be much generalizability between the respondents and MGMA's overall membership. For example, 53% of this study's respondents were male, compared with 47% for MGMA's membership. However, the t-test for this variable finds significant findings ($n = 686$, $p < .01$), indicating non-generalizability.

The other respondent characteristic tested, physician or non-physician, also has significant findings ($n = 684$, $p < .001$, sample = 11% physicians,

MGMA membership = 4% physicians). The organizational characteristic of size (i.e., FTE physicians) also indicated non-generalizability ($n = 686$, $p < .001$, sample = 41% of medical groups with less than 10 FTE physicians, MGMA membership = 71%).

In addition, multispecialty classification was also significant ($n = 679$, $p < .001$, sample = 49% multispecialty medical groups, MGMA membership = 34%). Finally, classification as an academic practice also indicated non-generalizability ($n = 681$, $p < .001$, sample = 15% of organizations are academic plans, MGMA membership = 10%). All in all, it does not seem likely that this study's actual respondents are very representative of the operationalized population.

Competitive Advantage Constructs

As the literature review indicated, competitive advantage is believed to be a multidimensional construct. As such, there are numerous conceptualizations of the optimal construct to represent competitive advantage. This study uses six individual competitive advantage indicants, as discussed earlier. This study will examine three different methods to operationalize competitive advantage: (1) as the six indicants individually; (2) as a new variable representing the average of the six indicants; and (3) as a new variable ranging from 0-6 that represents the number of indicants (out of six possible) with which the medical group experiences a high level of

competitive advantage. High competitive advantage is defined as a score of either 4 or 5 on a five point scale.

Three Methods

Can One Variable Be Used? In order to create one new variable, it should be determined if one variable can capture all the detail in the six individual indicants. This can be accomplished through the use of factor analysis. These six individual indicants were subjected to principal components factor analysis using varimax rotation (SPSS 6.1 Factor Analysis). Varimax rotation is an orthogonal method that attempts to minimize the number of variables that have high loadings on a factor (Norusis, 1994). The results of this factor analysis are shown on Table 4.2.

The correlation matrix and the Kaiser-Meyer-Olkin (KMO) measure appear first and second, respectively, on this table. These two items help determine if factor analysis is the appropriate technique to analyze these six specific items (Norusis, 1994). For example, if the correlations of the pairs of items in this matrix are low, it is unlikely that they share common factors. However, as can be seen on this table, the correlation matrix indicates that there are only high correlations (i.e., .25 and higher, with one exception).

The KMO measure is approximately .75. Values approaching .80 indicate that it is completely appropriate to proceed with factor analysis. These two items together (the matrix with moderate to high bivariate

Table 4.2

Competitive Advantage—Factor Analysis

Correlation Matrix:

	Quality	Service	Mkt Share	Profits	Cost Effectv	Survival
Quality	1.00000					
Service	.29427	1.00000				
Mkt Share	.32646	.36677	1.00000			
Profits	.25698	.34168	.48565	1.00000		
Cost Effectv	.16837	.48386	.30924	.51613	1.00000	
Survival	.28315	.30248	.53583	.37560	.38128	1.00000

KMO (Kaiser-Meyer-Olkin) Measure of Sampling Adequacy = .75184

Initial Statistics:

Variable	Communality	*	Factor	Eigenvalue	Pct of Var	Cum Pct
Quality	1.00000	*	1	2.83499	47.2	47.2
Service	1.00000	*	2	.89978	15.0	62.2
Mkt Share	1.00000	*	3	.78457	13.1	75.3
Profits	1.00000	*	4	.61445	10.2	85.6
Cost Effectv	1.00000	*	5	.52548	8.8	94.3
Survival	1.00000	*	6	.34073	5.7	100.0

Factor Matrix:

	Factor 1
Quality	.51923
Service	.67406
Mkt Share	.74907
Profits	.74036
Cost Effectv	.70706
Survival	.70842

Descriptive Statistics:

	Mean	Std Dev	Cases
Clin Qual	4.12059	.79774	680
Serv Orient	3.59941	1.00224	679
Mkt Share	3.77713	.97857	682
Profit	3.48000	1.03963	675
Cost Effectv	3.42353	.99928	680
Org Survival	3.87518	.98548	681

correlations and the high KMO value) indicate that it is appropriate to use factor analysis to analyze these six individual items.

Table 4.2 next shows the initial statistics of the factor analysis, along with the factor matrix. As can be seen, the six items that make up the competitive advantage construct load on only one factor (i.e., only one factor has an eigenvalue of greater than one) and the loadings from the factor matrix are all over .50. Additionally, the scree plot shown in Figure 4.1 indicates that only one factor (i.e., a "strong" factor per Pedhazur and Schmelkin, 1991) is appropriate to represent all six items. In addition, this scale has relatively high reliability (i.e., Cronbach's alpha is .777; not shown).

This implies that the construct of competitive advantage, when measured with these six indicants, has construct validity and is a candidate for representation by only one variable. The next step is to determine which single variable to use as the competitive advantage construct. The two new variables will be compared with each other to determine the best new, single variable to operationalize the construct of competitive advantage.

Comparison of the Two New Variables. The two candidates for representing competitive advantage are called MeanCA (the mean or average of the six indicants) and HighCA (the number of indicants with which the medical group experiences a high level of competitive advantage). Table 4.3 shows the comparisons made between these two variables.

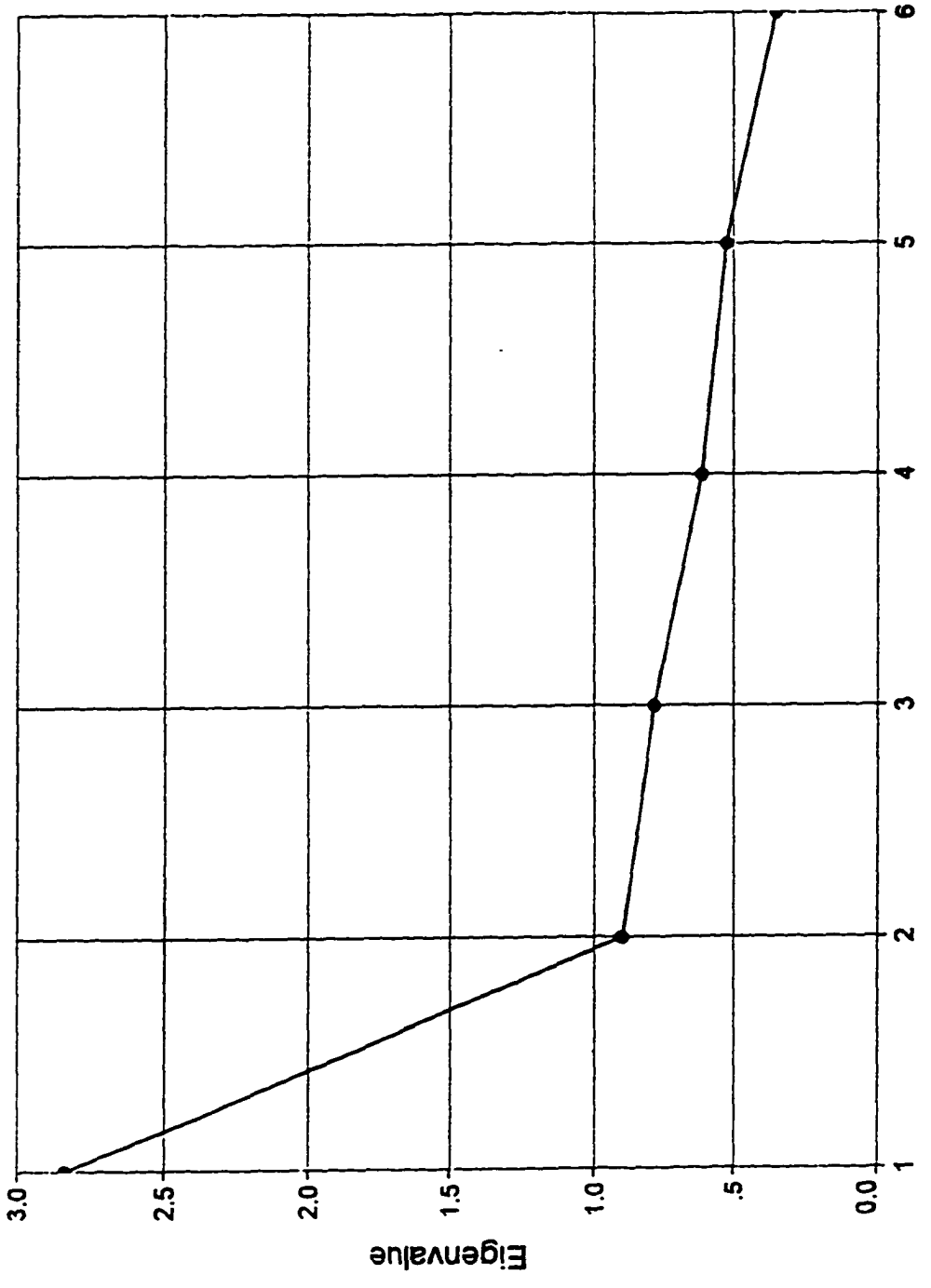


Figure 4.1: Scree Plot of Competitive Advantage Indicants.

Table 4.3

Competitive Advantage Construct Determination

Step 1--Correlations:	MeanCA	HighCA	
MeanCA	1.0000		
HighCA	.9200 *	1.0000	
Clin Qual	.5324 *	.4969 *	
Serv Qual	.6827 *	.6117 *	
Mkt Share	.7388 *	.6955 *	* = p<.01
Profitability	.7382 *	.6791 *	
Cost Effctvns	.7081 *	.6555 *	
Survival	.7031 *	.6689 *	

Step 2-- Multiple Regression:

Dependent Variable: MeanCA

Independent Variable(s) Entered: Clin Serv Share Profit Cost Survl

R Square .99527 Adjusted R Square .99523

ANOVA:	DF	Sum of Squares	Mean Square
Regression	6	302.69218	50.44870
Residual	679	1.43812	.00212

F = 23819.02600 Signif F = .0000

Dependent Variable: HighCA

Independent Variable(s) Entered: Clin Serv Share Profit Cost Survl

R Square .85688 Adjusted R Square .85562

ANOVA:	DF	Sum of Squares	Mean Square
Regression	6	1755.89812	292.64969
Residual	679	293.27147	.43192

F = 677.56041 Signif F = .0000

Step 3--Correlations with Independent Variable

	SIG	
MeanCA	-.1244 *	
HighCA	-.1025 *	
Clin Qual	-.1061 *	
Serv Qual	-.1638 *	* = p<.01
Mkt Share	-.0662	x = p<.05
Profitability	-.0896 x	
Cost Effctvns	-.1038 *	
Survival	.0102	

Step 1 shows the Pearson correlation coefficients between each variable and the six individual indicants. With no exceptions, MeanCA had slightly higher correlations with the six indicants than HighCA. All of the correlations were significant ($p<.01$) and high (i.e., between .497 and .739). In addition, the correlation between MeanCA and HighCA is .920, which is high and is to be expected since both new variables are created from the same six indicants, albeit using different algorithms. MeanCA has slightly higher correlations with each of the six individual indicants.

At Step 2, two separate regressions (SPSS 6.1 Multiple Linear Regression) were run (selected results are shown), one with MeanCA as the dependent variable and one with HighCA as the dependent variable. For both regressions, the six individual indicants were used as the six independent variables. The adjusted R^2 for MeanCA predicted by the six indicants is .995, whereas for HighCA it is .857. This means that the six indicants explain more of MeanCA than they explain of HighCA.

In Step 3, the correlations between the main variable of interest in this study (i.e., SIGs), and the three candidates for competitive advantage (MeanCA, HighCA, and the six individual indicants) are presented. This step is performed to ascertain if the associations between the three candidates for the dependent variable and the major independent variable are similar. As can be seen, the correlation between SIG and MeanCA and the correlation between SIG and HighCA have the same sign, are significant

($p<.01$) and are very close to one another (-.124 and -.103, respectively). In addition, the variable of SIG shares similar associations (some significant and some not significant) with the six individual indicants. Therefore, the use of the six individual indicants or the use of either of the two new variables should not change the relationship between SIG and competitive advantage.

Summary. This three-step comparison makes it clear that: (1) the competitive advantage construct can be represented by one variable; and (2) MeanCA represents the six individual indicants better than HighCA (based on Step 1 and Step 2). Therefore, MeanCA (the mean or average of the six individual indicants) will be used throughout this study, along with the six indicants separately, to represent the seven operationalized constructs of competitive advantage.

Results and Interpretations of Research Question #1

Research question #1 asks: Do SIGs exist and, if so, what do they look like? As discussed earlier, the similarity of this new concept of SIGs with the strategic group literature allows the use of similar analysis techniques. The strategic group literature has used cluster analysis to a great extent when determining strategic group membership (Dixon, 1994). Therefore, this study will also use clustering techniques to determine if SIGs exist and what the SIGs look like.

This stage of the analysis involves determining the actual SIG or cluster to which each medical group respondent organization may be a member. The cluster membership of each medical group is based on the different patterns of answers to the fifteen structural linkage questions (i.e., the different patterns of the two dimensions of number of partners and level of partner interdependencies). The data is used in unstandardized form since it was originally coded as binary data (i.e., 0 and 1).

Preparation for Cluster Analysis

There are three questions that must be answered prior to embarking on the actual cluster analysis (Norusis, 1994). They are: (1) Which indicants will serve as the basis for cluster formation?; (2) How will the distance between cases be measured?; and (3) What algorithm will be used for combining cases into clusters?

Indicants. The fifteen indicants used to create the SIG clusters have been thoroughly described earlier in this study. In summary, all of these fifteen indicants have two components to them: (1) a type of organizational partner; and (2) a particular type of structural linkage that has a certain level of interdependence intensity. Since the data is in binary form, it is not necessary to standardize it. Table 4.4 shows the acronyms that will be used in data analysis tables and figures for the fifteen indicants.

Table 4.4

Acronyms for Structural Integration Group Indicants

Acronyms	Indicants
Relationships with Managed Care Organizations (MCOs)	
FFS-MCO	Fee-for-service contracts with MCOs
Capitat-MCO	Capitated contracts with MCOs
Own-MCO	Own a MCO
Relationships with Hospitals	
Infrml-Hosp	Informal strategic alliances with hospitals
Frml-Hosp	Formal strategic alliances with hospitals
JV-Hosp	Joint investments with hospitals
Own-Hosp	Own a hospital
Acqrdby-Hosp	Acquired by a hospital
Relationships with Other Medical Groups (OMGs)	
Infrml-OMG	Informal strategic alliances with OMGs
Frml-OMG	Formal strategic alliances with OMGs
JV-OMG	Joint investments with OMGs
Own-OMG	Own an OMG
Acqrdby-OMG	Acquired by an OMG
Relationships with Integrated Delivery systems/Networks	
IDN	Member of a loosely-integrated delivery network
IDS	Member of a fully-integrated delivery system

Distance. The distance measurement chosen for each pairwise combination of cases clustered is the Euclidean distance. According to Dixon (1994), this measure has been predominantly used in strategic group studies, which form the basis for the methodology in this study.

Algorithm. For social scientists, the algorithm to use for clustering can be either hierarchical or non-hierarchical (Norusis, 1994). While there are other categories of clustering techniques, they tend to be so specialized and/or complex that they are not as easily understood, and, therefore, not used in social science research (Aldenderfer and Blashfield, 1985).

Hierarchical clustering methods can be further divided into agglomerative and divisive (Aldenderfer and Blashfield, 1985; Lorr, 1983). Agglomerative hierarchical cluster analysis starts with "N" groups (where "N" represents that number of cases to be clustered). These "N" groups are gradually combined to form a single group through the clustering steps. Divisive hierarchical cluster analysis is just the opposite. It begins with a single group, which is subsequently divided into "N" groups.

Non-hierarchical clustering techniques are generally referred to as single level techniques (Lorr, 1983). These methods require that the researcher set the number of clusters to be derived anywhere from 1-N. Non-hierarchical clustering techniques are preferred when analyzing large (e.g., more than 100 cases) datasets (Norusis, 1994). Since this study's dataset

contains 686 cases, this study will use a non-hierarchical clustering technique.

Determining the Number of Clusters

While the true or natural number of clusters expected to be found in this study is not known, this is not unusual. Most studies of an exploratory nature do not have available a predetermined number of clusters (Lorr, 1983). This is due to the lack of an agreed upon definition of the nature and content of a cluster (Aldenderfer and Blashfield, 1985). Without some consensus on exactly what a cluster is, it is difficult for researchers with different interests to agree to a common definition.

Without a common definition, it is very difficult to decide what the natural number of clusters should be in a dataset. However, given the theoretical bases of the concept of SIGs (see the discussion involving Figures 2.2 and 2.3), any clusters produced within this study can probably be seen as relatively "natural" clusters.

There do exist statistical ways to test for the appropriate cut-off point (i.e., when to stop the clustering process) in clustering methods. However, these statistical tests are generally not appropriate (Bailey, 1994). This is due to the very simplistic nature of clustering, which means that clustering is not really supported by detailed statistical reasoning (Aldenderfer and Blashfield, 1985), but is more subjective than researchers acknowledge (Lorr,

1983). For exploratory studies, it is often more important to find an appropriate number of "natural" clusters in order to proceed with the clustering than it is to become stagnant because of over-analysis of the techniques used to create the appropriate number of clusters.

Factor Analysis Approach. Therefore, for this study, the number of natural clusters to be used in the clustering techniques will be determined using the principal components factor analysis method. There is much similarity between factor analysis and cluster analysis (Aldenderfer and Blashfield, 1985; Norusis, 1994). The way many researchers tend to, in effect, throw away the additional information provided by factor analysis (through the process of rotating the factor analysis results in such a way that each variable or case has a high loading on only one factor) makes the usual use of factor analysis a de facto cluster analysis (Bailey, 1994).

In addition, most researchers will agree that only one clustering solution will never be found. The same data can yield differing sets of clusters, depending on the clustering or factor analysis method used (Aldenderfer and Blashfield, 1985). However, the more highly correlated the indicants, the more likely that the different clustering and factor analysis techniques will yield the same number of clusters or factors (Bailey, 1994).

Clusters are groupings of the cases in a dataset based the level of similarity of responses to a selection of indicants. Factors, however, are parsimonious groupings of the indicants themselves. While this may seem

like clustering and factoring methodologies would not be directly comparable, that is not the case (Norusis, 1994). In order to make sense of the case groupings in cluster analysis, the indicant groupings are often examined. In fact, this examination of indicants is generally the manner in which clusters are interpreted. Therefore, the use of factor analysis to create the number of clusters for use in clustering methodologies is appropriate.

The Pearson correlation coefficients of all the bivariate relationships (SPSS 6.1 Bivariate Correlations) for the fifteen indicants that will be used to create factors (clusters) for this study are shown in Table 4.5. With almost one-quarter (25 out of 105) of the correlations greater than .20 and, therefore, deemed relatively high (at least in social science research), it seems likely that the different clustering and factor analysis methods would give similar results regarding the natural number of clusters for this dataset.

Determination of Factors. The principal components factor analysis technique was used to determine the number of clusters for this study's cluster analysis. Factor analysis is rooted heavily in statistical rigor (Bailey, 1994; Kim and Mueller, 1978). Therefore, sophisticated statistical techniques can be utilized to determine the appropriate number of factors from a particular dataset (Kim and Mueller, 1978; Norusis, 1994; Pedhazur and Schmelkin, 1991). For example, valid ways to determine which factors matter include: (a) eigenvalues greater than 1.00; (b) scree plots; and (c) comparisons of eigenvalues and communalities. In addition, since this study

Table 4.5

Correlations of Structural Integration Group Indicants

	FFS-MCO	Capitat-MCO	Own-MCO	Infrml-Hosp	Frml-Hosp	JV-Hosp	Own-Hosp	Acqrdby-Hosp	Infrml-OMG	Frml-OMG	JV-OMG	Own-OMG	Acqrdby-OMG	IDN	IDS
FFS-MCO	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Capitat-MCO	.074	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.
Own-MCO	.023	.197 *	1.00	.	.	.	.	.	.	.	.	.	.	.	.
Infrml-Hosp	.031	-.039	-.069	1.00	.	.	.	.	.	.	.	.	.	.	.
Frml-Hosp	.016	.188 *	.143 *	-.152 *	1.00	.	.	.	.	.	.	.	.	.	.
JV-Hosp	.092 x	.212 *	.341 *	-.037	.333 *	1.00	.	.	.	.	.	.	.	.	.
Own-Hosp	-.027	.140 *	.249 *	-.063	.131 *	.265 *	1.00	.	.	.	.	.	.	.	.
Acqrdby-Hosp	-.011	.100 *	-.017	-.105 *	.230 *	.076 x	-.050	1.00	.	.	.	.	.	.	.
Infrml-OMG	.043	-.014	.028	.223 *	-.019	.055	.078 x	-.102 *	1.00	.	.	.	.	.	.
Frml-OMG	-.013	.142 *	.228 *	.004	.254 *	.268 *	.188 *	-.014	.081 x	1.00	.	.	.	.	.
JV-OMG	.051	.065	.189 *	-.077 x	.183 *	.261 *	.236 *	-.050	.117 *	.292 *	1.00	.	.	.	.
Own-OMG	.017	.325 *	.251 *	.011	.161 *	.261 *	.207 *	.090 x	.067	.219 *	.208 *	1.00	.	.	.
Acqrdby-OMG	-.086 x	.004	-.034	-.090 x	.043	.041	.149 *	-.024	-.061	.023	.120 *	.058	1.00	.	.
IDN	.051	.037	.032	.257 *	.101 *	.079 x	-.034	-.042	.191 *	.060	.033	.079 x	-.046	1.00	.
IDS	.018	.164 *	.290 *	-.194 *	.303 *	.282 *	.233 *	.162 *	-.082 x	.188 *	.230 *	.183 *	.068	-.182 *	1.00

x = p<.05 * = p<.01

is exploratory (rather than confirmatory) regarding clusters of SIGs, the actual number of clusters used should not be over-analyzed (Kim and Mueller, 1978). Therefore, these three analysis techniques should prove to be useful enough for this study.

The results of the factor analysis appear on Table 4.6. This table shows both the initial statistics and the final statistics. Using the eigenvalue criteria, there are, at most, five factors that should be considered (i.e., there are five factors with eigenvalues greater than 1.00). The eigenvalue cutoff of 1.00 is based on the idea that, when eigenvalues are less than 1.00, the variables, themselves, are more parsimonious than the factors (Norusis, 1994). Therefore, only factors with eigenvalues greater than one are retained.

We could stop here and conclude that we should use five clusters to proceed with the non-hierarchical clustering method. However, the eigenvalue for the fifth factor (1.019) is very close to the cutoff value of 1.00. In fact, it is so close that it may be suspect to include it. Clearly, another factor determination technique should be explored.

Using more than one analysis technique is not unusual. In fact, it has been argued that it is often advantageous to perform several different factoring tests in combination with each other (Kim and Mueller, 1978). Therefore, this study will next examine the data's scree plot. Figure 4.2

Table 4.6

Factor Analysis of Structural Integration Group Indicants

Initial Statistics:

Variable	Communality	*	Factor	Eigenvalue	Pct of Var	Cum Pct
FFS-MCO	1.00000	*	1	2.86231	19.1	19.1
Capitat-MCO	1.00000	*	2	1.65216	11.0	30.1
Own-MCO	1.00000	*	3	1.27690	8.5	38.6
Infrml-Hosp	1.00000	*	4	1.06260	7.1	45.7
Frml-Hosp	1.00000	*	5	1.01921	6.8	52.5
JV-Hosp	1.00000	*	6	.95242	6.3	58.8
Own-Hosp	1.00000	*	7	.84782	5.7	64.5
Acqrdby-Hosp	1.00000	*	8	.82134	5.5	70.0
Infrml-OMG	1.00000	*	9	.74900	5.0	75.0
Frml-OMG	1.00000	*	10	.71984	4.8	79.8
JV-OMG	1.00000	*	11	.67400	4.5	84.3
Own-OMG	1.00000	*	12	.64521	4.3	88.6
Acqrdby-OMG	1.00000	*	13	.61939	4.1	92.7
IDN	1.00000	*	14	.59421	4.0	96.6
IDS	1.00000	*	15	.50359	3.4	100.0

Final Statistics:

Variable	Communality	*	Factor	Eigenvalue	Cumulative Eigenvalue
FFS-MCO	.52228	*	1	2.86231	2.86
Capitat-MCO	.62488	*	2	1.65216	4.51
Own-MCO	.47256	*	3	1.27690	5.78
Infrml-Hosp	.50089	*	4	1.06260	6.84
Frml-Hosp	.66025	*	5	1.01921	7.86
JV-Hosp	.48144	*			
Own-Hosp	.46239	*			
Acqrdby-Hosp	.61062	*			
Infrml-OMG	.42694	*			
Frml-OMG	.39085	*			
JV-OMG	.52357	*			
Own-OMG	.56859	*			
Acqrdby-OMG	.53138	*			
IDN	.58674	*			
IDS	.50978	*			
Total	6.85				

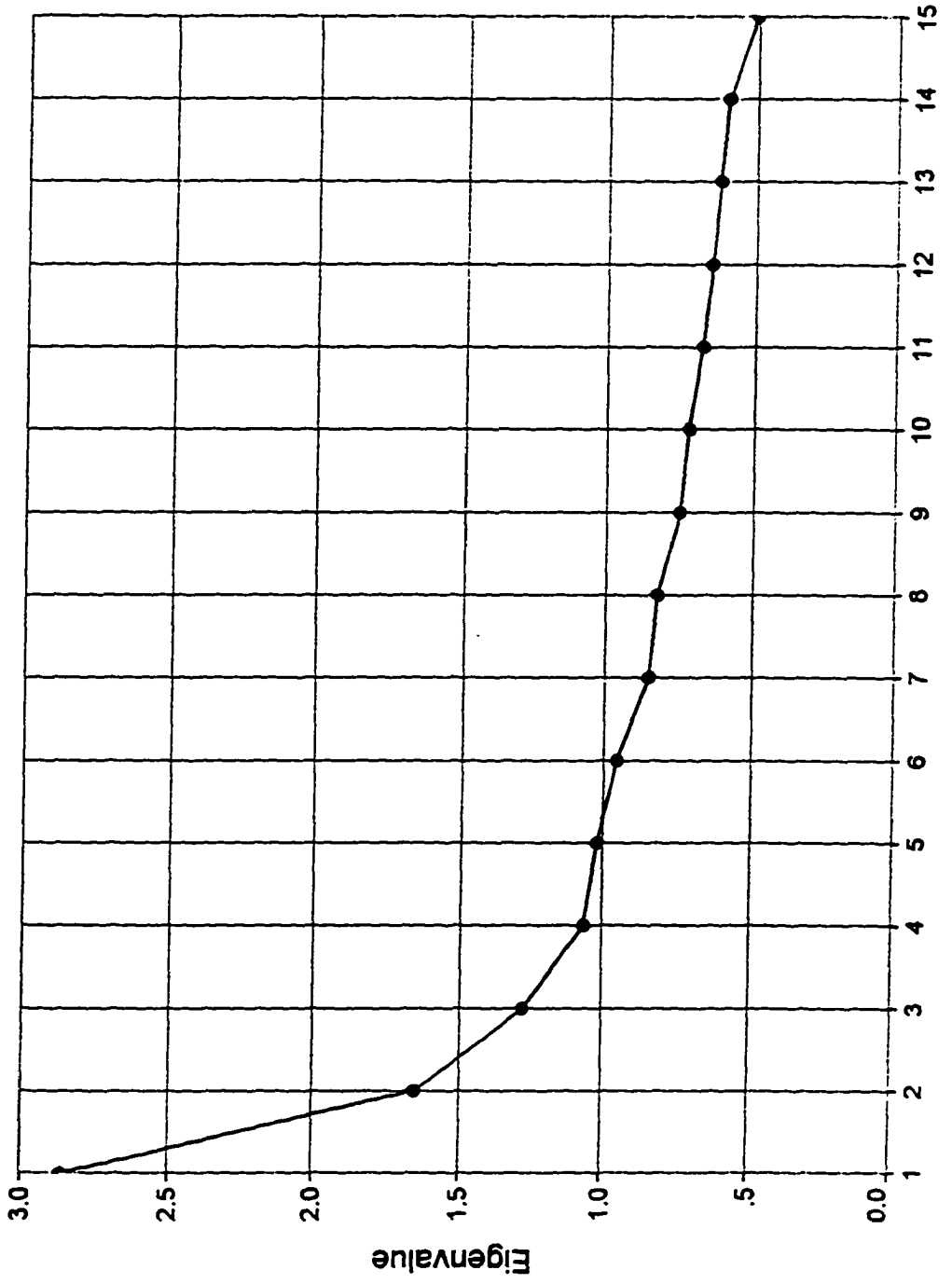


Figure 4.2: Scree Plot of Structural Integration Group Indicants.

shows the scree plot for the fifteen indicants. From this plot, it seems that either three or four factors would be acceptable. This means that we have now used two different techniques to determine the appropriate number of factors and have three different possible number of factors: three, four, or five.

The next factor determination step to perform is a test of the cumulative effects of both the communalities and the eigenvalues. This test states that factor extraction should stop before the cumulative sum of eigenvalues exceeds the sum of the estimated communalities (Kim and Mueller, 1978). This data is shown on (the previously discussed) Table 4.6.

The sum of the estimated communalities is 6.85. The last factor before the cumulative sum of the eigenvalues exceeds 6.85 is the fourth factor (cumulative sum of eigenvalues up to this factor is 6.84). Adding the next (i.e., the fifth) factor gives a cumulative sum of eigenvalues of 7.86. Clearly, this fifth factor causes the cumulative eigenvalues to grossly exceed the sum of the communalities. Therefore, the clear choice from this factor determination step is to suggest that four factors be extracted.

Estimation of Number of Clusters. Comparing these three steps of factor determination indicates that four is probably a good choice for the number of extracted factors. For instance, the first step (based on eigenvalues greater than 1.00) indicated that five factors were greater than 1.00. However, as previously discussed, the fifth factor was extremely close

to 1.00 (it was 1.019) and may not be appreciably different than a factor slightly below 1.00. Therefore, four factors could have been proposed from this step.

The next step (based on a visual examination of the scree plot in Figure 4.2) indicated that either three or four factors could be extracted. Finally, the last step (comparing eigenvalues and communalities) indicated that four factors should be extracted. Therefore, the three steps consistently indicate that four factors can be legitimately extracted. This means that four clusters will be used to perform the non-hierarchical cluster analysis.

Proposition 1a Findings

Support is found for this proposition. Identifiable SIGs do exist in a parallel fashion (at least methodologically) to strategic groups. They can, therefore, be legitimately studied.

Organizational Membership in Clusters

Once the number of clusters are known, organizational membership of the clusters (i.e., the SIGs) can be determined. As previously mentioned, cluster analysis is a procedure that creates empirically driven, mutually exclusive categorizations of respondent organizations. In cluster analysis, each respondent organization is assigned membership to one and only one

cluster or SIG based on both the specific partners and the particular interdependence levels of those specific collaboration efforts.

Cluster analysis seeks to simultaneously maximize within group similarity and maximize between group differences. This procedure essentially groups respondent organizations based on the similarity of patterns of responses for the fifteen individual indicants.

The algorithm used for determining cluster membership was the k-means clustering technique from SPSS 6.1 (Norusis, 1994). This procedure uses the nearest centroid sorting method, which assigns a case (i.e., medical group) to a cluster based on the smallest Euclidean distance between the case and the center of the cluster. The k-means clustering technique assigns each case to one and only one of the four allowable clusters.

Cluster Size. Table 4.7 shows the number of organizations assigned to each of the four clusters. Cluster #2 has the most organizations within it, while Cluster #3 has the fewest. Without knowing something about the characteristics of the clusters, it is impossible to determine if the quantities of medical groups in their respective clusters seems to make intuitive sense.

Cluster Distinctiveness. The next step in the cluster analysis process is to assess just how well separated the clusters are from each other. Table 4.8 illustrates this information as it presents the Euclidean distance between the last (i.e., final) centers of the four clusters. Ideally, the clusters will have

Table 4.7

Structural Integration Group Cluster Size

Cluster	Frequency	Percent
1	123	18.2
2	318	47.0
3	47	7.0
4	188	27.8
Total	676	100.0

Table 4.8

Distances Between Final Cluster Centers of Structural Integration Groups

Cluster	1	2	3	4
1	.0000			
2	1.2862	.0000		
3	1.7461	2.0671	.0000	
4	1.2347	1.0506	1.5072	.0000

centers that are far apart. This implies that the further the values are from zero, the better.

It is difficult to actually derive a conclusive and definitive statement regarding the distinctiveness of clusters when analyzing this type of table (Norusis, 1994). This highlights once again the inherent subjectiveness of clustering. For these data, the cluster centers seem to be about the same distance from each other (assuming values within the range of 1.05-2.07 are considered similar). This, coupled with the fact the none of the differences are close to zero, indicates that these four clusters do, indeed, represent four distinct clusters of organizations.

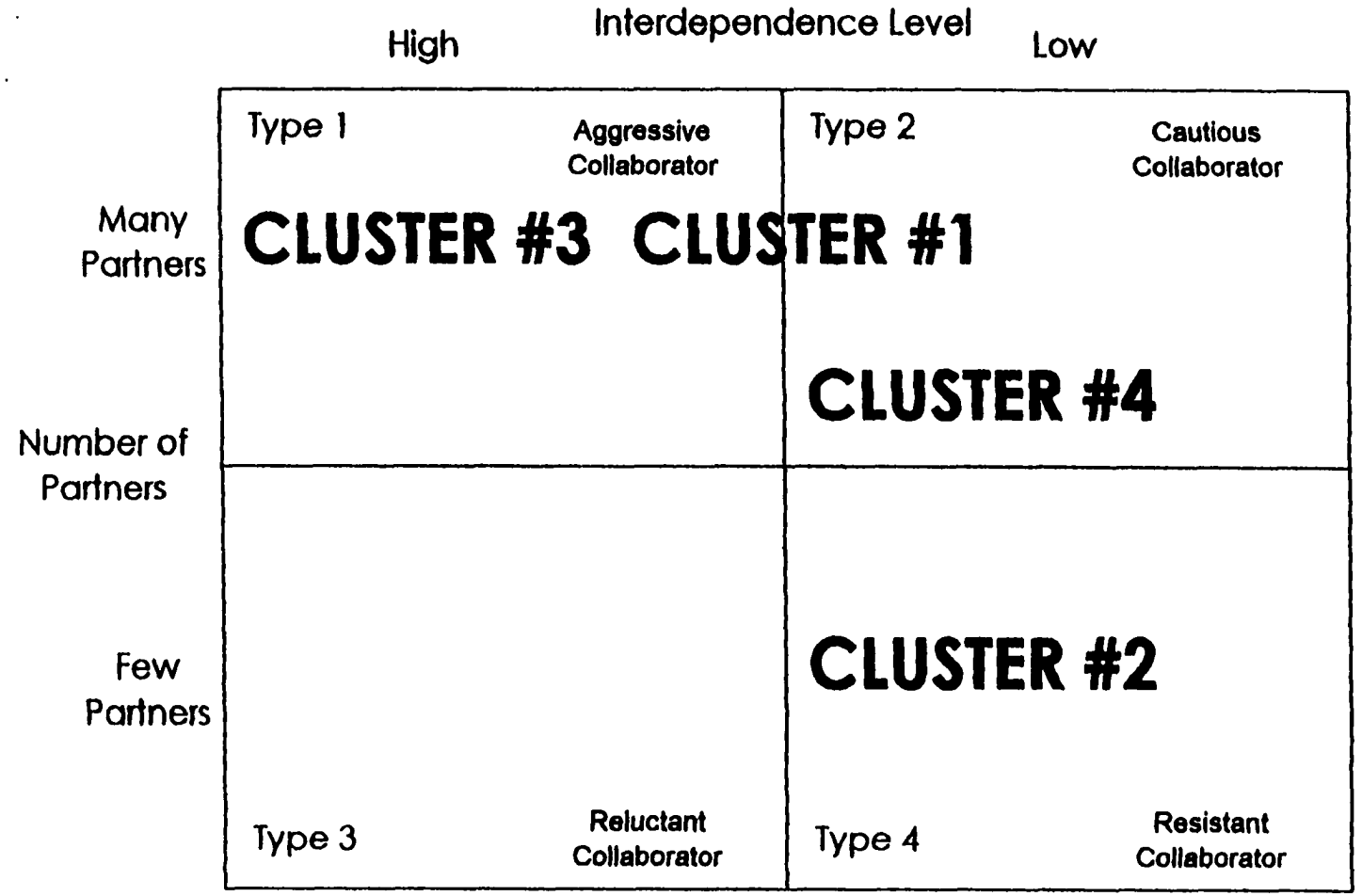
Cluster Centers. An analysis of the center of each cluster vis-à-vis each of the fifteen indicants is shown in Table 4.9. The values for the cluster centers represent the average values for the indicants for the cases within each cluster. For these data, since it is binary (i.e., 0 or 1), the values for the cluster centers also represent the percentage of cases within each cluster that have the specific structural relationship. For example, looking at Table 4.9, Cluster #1 has a value of .92 for its center value for the variable "fee-for-service with MCO." This means that 92% of the medical groups in Cluster #1 had fee-for-service contracts with managed care organizations. The other center values are interpreted similarly.

The four empirically-generated clusters map onto the fourfold model of conceptually-generated SIGs, as shown on Figure 4.3. Cluster #1 falls

Table 4.9

Final Cluster Centers of Structural Integration Groups

Linkage	Cluster #1 (N = 123)	Cluster #2 (N = 318)	Cluster #3 (N = 47)	Cluster #4 (N = 188)
Linkages with Managed Care Organizations				
Fee-For-Service	.92	.90	.93	.92
Capitation	.69	.11	.78	.90
Own One	.17	.01	.57	.12
Linkages with Hospitals				
Informal Alliance	.90	.55	.19	.15
Formal Alliance	.33	.10	.85	.45
Joint Venture	.29	.03	.78	.16
Own One	.04	.00	.31	.02
Acquired By	.06	.01	.06	.13
Linkages with Other Medical Groups				
Informal Alliances	.70	.24	.27	.12
Formal Alliances	.42	.08	.89	.19
Joint Venture	.16	.04	.59	.05
Own One	.67	.11	.91	.46
Acquired By	.00	.00	.04	.00
Linkages with Integrated Delivery Organizations				
Network	.93	.31	.17	.28
System	.02	.02	.76	.13



(The "types" are logical, *a priori* types. The "clusters" are empirically-generated types.)

Figure 4.3: Clusters of Empirically Generated Structural Integration Groups.

between the aggressive collaborator and the cautious collaborator. Clusters #2, #3, and #4 clearly fall into the SIG categories of resistant collaborator, aggressive collaborator, and cautious collaborator, respectively. The conceptually-generated SIG of reluctant collaborator was not found in these data.

Description of Clusters. This cluster description section is based on information contained on Table 4.9 and on the previously discussed Figures 3.3 and 3.4 (i.e., a collapsing of the fifteen indicants into partner and interdependence level, respectively). During the description of each cluster, the most prevalent relationships will be discussed first. These are relationships that exist in at least 67% of the member organizations and are considered to be primary characteristics of the SIG.

Less prevalent relationships (those existing in between 34%-66% of member organizations) will be mentioned next. These structural relationships are considered to be secondary characteristics of the SIGs. Structural relationships in which 33% or less of the medical groups are involved are not considered to be characteristics of the SIG. In other words, a particular structural relationships must be common to at least one third of the member organizations in order for it to be deemed an important characteristics of the SIG.

A discriminant analysis (SPSS 6.1 Discriminant Analysis) was performed to determine which of the fifteen indicants contributed most to the

SIG construct (i.e., which SIG characteristics matter the most). Table 4.10 shows the Wilks' Lambda U-statistic for each of the fifteen indicants. Using a cutoff of .75 (Norusis, 1994), seven structural linkages were found to have the strongest discriminating power vis-à-vis SIGs.

These seven structural linkages are (ordered by decreasing importance): (1) capitated contracts with managed care organizations (Wilks' Lambda = .490); (2) membership in integrated delivery systems (.645); (3) ownership of other medical groups (.706); (4) informal alliances with hospitals (.714); (5) joint ventures with hospitals (.736); (6) formal alliances with other medical groups (.738); and (7) membership in integrated delivery networks (.742).

While these seven indicants contribute the most to discriminating or separating the respondent medical groups into distinct SIGs, all of the fifteen indicants were used in the study because the use of all fifteen indicants allows for finer lines to be drawn between SIG clusters (i.e., the cluster centers are further apart).

Figure 4.4 shows a revised typology of SIGs based on these empirically-generated SIGs, along with the number of medical groups in each SIG category. Cluster #1, which fell between the aggressive collaborator and the cautious collaborator, has been named the master collaborator. The type of organization in this SIG completely embraces the concept of collaboration

Table 4.10

Discriminant Analysis of SIG Clusters

Linkages with	Wilks' Lambda (U-statistic)
Managed Care Organizations:	
Fee-For-Service	1.000
Capitation	.490 *
Own One	.806
Hospitals:	
Informal Alliance	.714 *
Formal Alliance	.786
Joint Venture	.736 *
Own One	.826
Acquired By	.958
Other Medical Groups:	
Informal Alliances	.812
Formal Alliances	.738 *
Joint Venture	.796
Own One	.706 *
Acquired By	.989
Integrated Delivery Organizations:	
Network	.742 *
System	.645 *

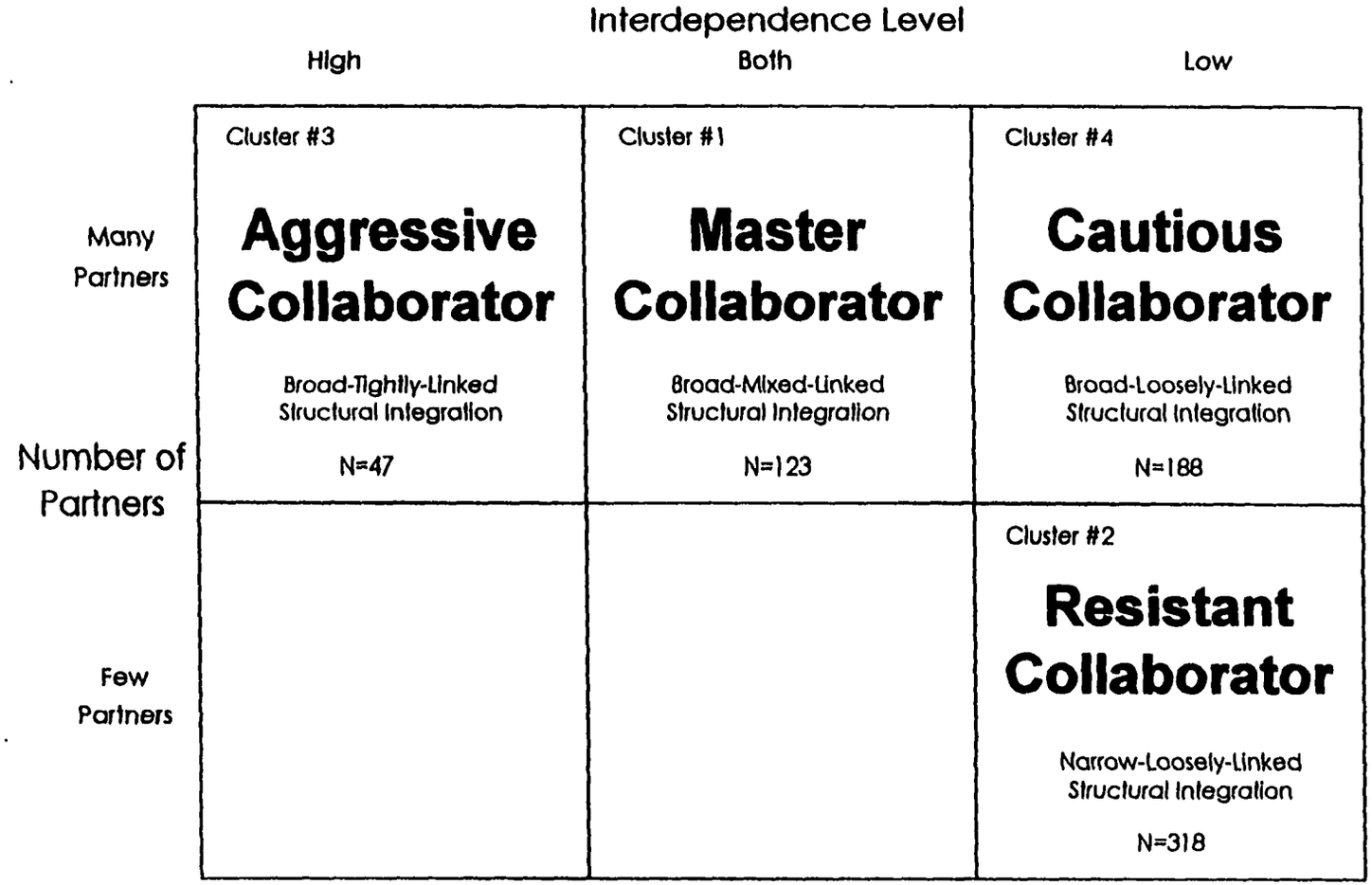


Figure 4.4: Empirically-Based Revised Typology of Structural Integration Groups.

and wholeheartedly gets involved in both low and high levels of interdependencies with its many partners.

Description of Cluster #1—Master Collaborator

The 123 medical groups categorized in this SIG tend to have: (a) both fee-for-service (chosen by 92% of member medical groups) and capitated contracts (69%) with managed care plans; (b) informal alliances (90%) with hospitals; (c) informal (70%) and formal (42%) alliances with and direct ownership (67%) of other medical groups; and (d) membership in integrated delivery networks (93%). They have structural relationships with all four potential intra-industry partners and are involved in both low and high levels of partner interdependence. They have "mastered" the integration concept.

Description of Cluster #2—Resistant Collaborator

The 318 medical groups classified as this type of SIG generally have: (a) fee-for-service contracts (90%) with managed care organizations; and (b) informal alliances (65%) with hospitals. In other words, they have few partners and very low level collaboration efforts.

Both fee-for-service contracts with managed care organizations and informal alliances with other medical groups are indicative of the traditional

way of conducting business in health care. All the structural relationships of these resistant collaborator medical groups exhibit the low level of partner integration. These medical groups seem to be actively "resisting" integration.

Description of Cluster #3—Aggressive Collaborator

The 47 medical groups categorized as this type of SIG have mostly moderate and high level interdependencies with all four of their intra-industry partners. Their structural relationships tend to be: (a) fee-for-service (93%) and capitated (78%) contracts with and direct ownership (57%) of managed care organizations; (b) formal alliances (85%) and joint ventures (78%) with hospitals; (c) formal alliances (89%) and joint ventures (59%) with and direct ownership (91%) of other medical groups; and (d) members of fully integrated delivery systems (76%). These medical groups seem to be actively involved in higher level integration efforts with all four of their potential intra-industry partners. They are "aggressively" pursuing highly interdependent integration.

Description of Cluster #4—Cautious Collaborator

The 188 medical groups categorized as this type of SIG have a varied mix of structural relationships with three of their four potential intra-industry partners. Their structural relationships tend to be: (a) fee-for-

service (92%) and capitated (90%) contracts with managed care organizations; (b) formal alliances (45%) with hospitals; and (c) direct ownership (46%) of other medical groups.

These medical groups seem to be involved in very selective collaborative efforts. All of the structural relationships these medical groups are characterized by are also the same types of structural relationships that at least two of the other SIG types have, perhaps indicating that these medical groups subscribe to the bandwagon theory of innovation adoption. These organizations are "cautiously" involved in integration.

Now that the four empirically generated clusters have been assigned descriptive names and meanings, it is appropriate to examine the quantity of medical groups in each cluster to determine if the quantities look right (i.e., to determine if the clusters have "face" validity). This cluster membership quantity was shown on Figure 4.4.

As can be seen on that figure, the Narrow-Loosely Linked SIG has the most medical group members, while the Broad-Tightly Linked SIG has the fewest members. The other two clusters fall nicely in place between these "end points." In other words, most of the medical groups are classified into the SIG that has few partners (i.e., narrow) and low interdependence levels (i.e., loosely linked), and, as the number of partners increases (i.e., broad) and as the interdependence level becomes higher (i.e., tightly linked), fewer medical groups are members of the specific SIGs.

This quick test offers face validity to the empirically generated SIGs since this situation is what would be expected in today's US health care industry.

Proposition 1b Findings

Support is found for this proposition. The empirically generated SIGs are consistent with the four conceptual types of SIGs based on the two dimensions of number of partners and level of partner interdependence. Although one of the four conceptual SIGs was not found in these data, the existence of the other three indicates a strong fit between the conceptual and empirical SIGs. This may imply that SIGs are valuable strategic variables.

Interpretation of Clusters

This interpretation section examines the changes necessary to this study's analysis plan because of two reasons: (1) one of the conceptual SIGs was not empirically found in these data; and (2) a new type of SIG was empirically discovered. As shown on (the previously discussed) Figure 4.4, three of the four *a priori* SIG types were found in this study's data. Unfortunately, there were no empirically generated resistant collaborators (i.e., few partners and high partner interdependence) in this dataset. This

means that the proposition related to this SIG (i.e., Proposition 3c) cannot be tested in this study.

However, a new type of SIG was found. The master collaborator has many partners and has relationships that have both high and low levels of interdependence. A new proposition must be created that addresses the competitive advantage impact of this new empirically generated SIG. It is suggested that the competitive advantage of master collaborators will lie somewhere between the expected competitive advantage level of the two conceptually derived SIGs of aggressive collaborators and cautious collaborators. In other words, the competitive advantage of master collaborators should be less than that of aggressive collaborators and higher than that of cautious collaborators. This new proposition, labeled 3ab, is shown next.

Proposition 3ab: Organizations with *many* partners and both *high* and *low* levels of partner interdependence have *high-to-intermediate* levels of competitive advantage.

Figure 4.5 shows how this new SIG (i.e., master collaborator) leads to the new proposition 3ab, which relates to research question #3. Not shown on this figure is proposition 3c, which would have been in the lower left cell if the conceptual SIG of reluctant collaborator had been found in these data.

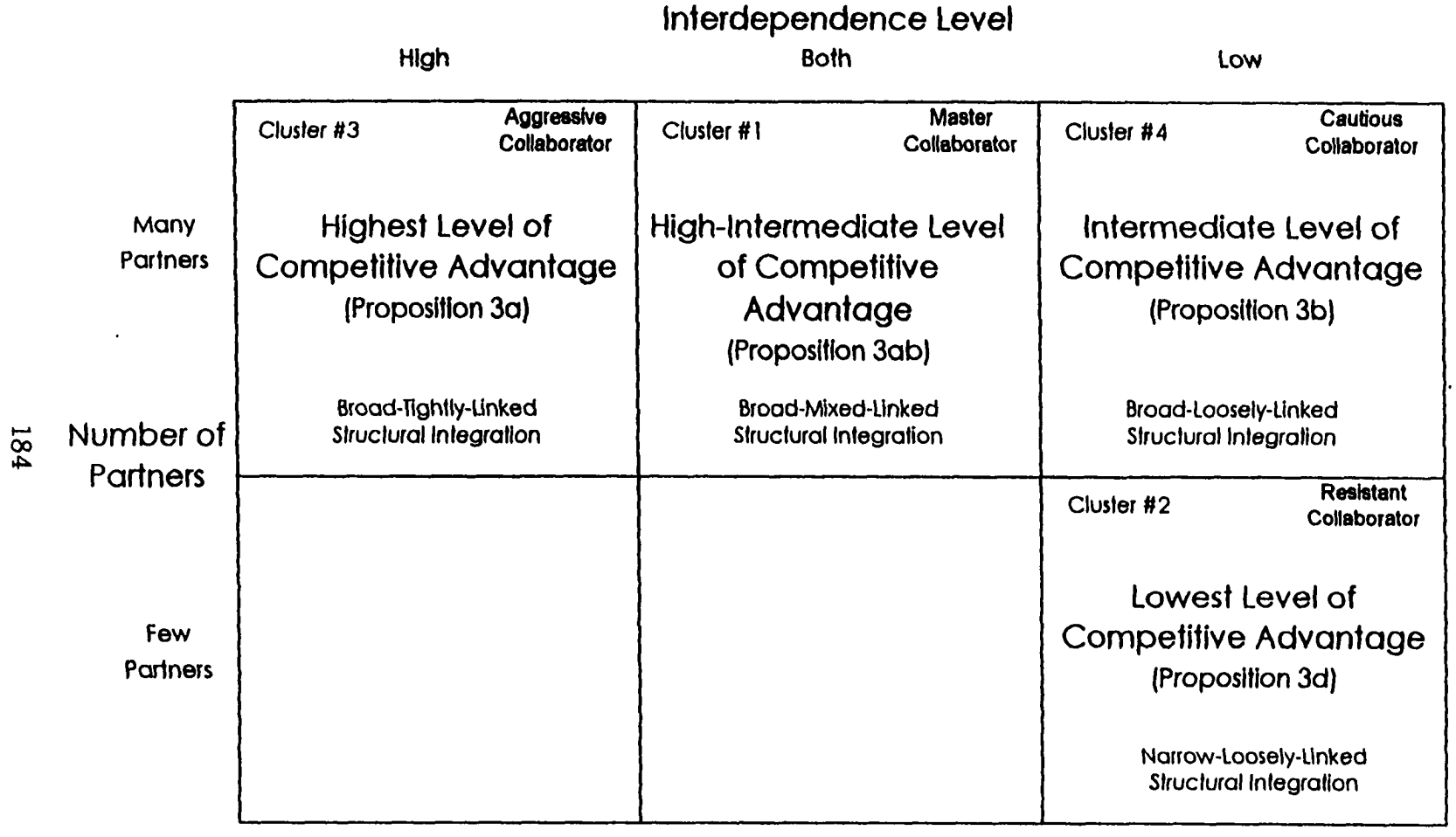


Figure 4.5: Empirical Typology of Structural Integration Groups--Competitive Advantage Implications

Since this is an exploratory study, the propositions cannot legitimately be more precisely specified than the vague terms of *higher*, *lower*, etc. However, the empirical existence of this new SIG has the potential to allow insight regarding whether the conceptually generated typologies affect competitive advantage in a linear fashion. This new SIG also means that the variable representing SIGs can be seen as an ordinal variable (rather than as a nominal variable) that has interpretation advantages when analyzing relationships between SIGs and other variables. To be viewed as an ordinal variable, the SIG variable requires some reference point to rank the different types of SIGs.

For example, using competitive advantage as the reference, the SIG variable would assign a value of 4 to aggressive collaborators since they are expected to have the highest amount of competitive advantage. A value of 3 would be given to master collaborators and a value of 2 would indicate cautious collaborators. Finally, resistant collaborators would be assigned a value of 1.

Multicollinearity Analysis

Now that the SIG construct has been established, multicollinearity analysis between the non-dependent variables can be conducted. The presence of high correlations (i.e., multicollinearity) between variables has

been shown to affect results of statistical tests (Pedhazur and Schmelkin, 1991). The goal of the good researcher is to eliminate as much multicollinearity as possible, without jeopardizing the integrity of the dataset. However, since correlations exist in all datasets, it is important to recognize that all multicollinearity cannot be avoided or eliminated.

Multicollinearity is assessed based on the correlations between pairs of variables (i.e., bivariate correlations). Theoretically, when a high correlation exists between two variables, one of the variables is a candidate for elimination from the study. The method of determining which of two highly correlated variables to leave in and which one to delete from a dataset is not as straightforward as one would hope. The decision to eliminate a variable should not rely exclusively on theoretical and/or empirical issues. Rather, judgment is required. For this particular study, a thorough understanding of substantive health care issues is necessary so that multicollinearity can be examined in that context specific domain.

Table 4.11 shows Pearson's correlation coefficients for all of the non-dependent variables in this study. For the social sciences, correlations can be considered worthy of investigation if the correlation coefficient is .250 or higher. As can be seen, these data have three correlations that would be considered high. These high correlations include: (1) .526 correlation between physician status and education level; (2) .320 correlation between number of full time equivalent physicians of the organization (i.e., the size of

Table 4.11

Correlations for Multicollinearity Test

	Gender	Age	Educ Level	Phys?	Strat Plan?	FTE Phys	Sing/Mult Spec	Acad Pract?	Turb	Collab	Payor-Payor	Capit	SIGs	Comp Advtg
Gender	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.
Age	-.011	1.00	.	.	.	.	.	.	.	.	.	.	.	.
Educ Level	-.066	.051	1.00	.	.	.	.	.	.	.	.	.	.	.
Physician?	-.043	.233 *	.526 *	1.00	.	.	.	.	.	.	.	.	.	.
Strategic Plan?	.009	-.021	.122 *	.041	1.00	.	.	.	.	.	.	.	.	.
FTE Phys	.016	.124 *	.153 *	.146 *	.146 *	1.00	.	.	.	.	.	.	.	.
Singl/Mult Spec	.008	.113 *	.220 *	.157 *	.184 *	.320 *	1.00	.	.	.	.	.	.	.
Acad Practice?	-.006	.017	.108 *	-.028	.045	.282 *	.174 *	1.00	.	.	.	.	.	.
Turbulence	-.048	-.009	.207 *	.114 *	.130 *	.134 *	.160 *	.066	1.00	.	.	.	.	.
Collaboration	.024	-.024	.002	.027	.077 x	-.049	.032	.053	.068	1.00	.	.	.	.
Payor-Driven	-.012	-.017	-.011	.010	.020	-.016	-.061	.060	.117 *	.146 *	1.00	.	.	.
Capitation	.045	.014	.066	.054	.068	.092 x	.107 *	.006	-.002	.117 *	.148 *	1.00	.	.
SIGs	.014	-.017	.177 *	.105 *	.213 *	.284 *	.314 *	.180 *	.173 *	.018	.046	.190 *	1.00	.
Comp Advtg	-.002	-.023	-.116 *	-.022	.039	-.126 *	-.182 *	-.363 *	-.209 *	-.013	.026	-.014	-.124 *	1.00

x = p<.05 * = p<.01

the medical group) and whether the medical practice is a multispecialty group; and (3) .282 correlation between size of medical group and whether the medical group is an academic practice. All three of these high correlations are statistically significant at .01 ($p<.01$).

Regarding the largest correlation (i.e., .526), this is likely an appropriate correlation for these two variables. By virtue of being medical doctors, physicians generally have higher educational status than non-physicians. In fact, as can be seen on Table 4.1 (presented earlier), only 93 respondents (out of 686) have doctoral degrees. Since there are only 75 physician respondents, that means only 18 (93 - 75 = 18) of the non-physicians (out of 593) had doctoral degrees. In other words, the non-physicians had masters degrees or lower degrees and the physicians had doctoral degrees. This results in high correlations between the two variables.

However, neither variable needs to be eliminated because the physician status variable provides obvious information and the educational level variable still has some potential explanatory power if the relationship between higher and lower levels of education of non-physicians is examined. Therefore, both variables will remain within this study because the potential multicollinearity cost does not outweigh the potential benefit gained by the inclusion of both of these two variables.

The second high correlation (.320) between the size of the organization and whether the medical practice is a multispecialty group can also be

explained using the context specificity of the health care industry. Multi-specialty groups are large medical practices, at least relative to single specialty practices. Therefore, this high correlation makes sense. However, neither of these two variables will be eliminated from this study because it may be important for explanatory purposes to know whether the type of medical group or whether the size of the medical group had more effect on either the membership in specific SIGs or the respondent organization's competitive advantage position.

The third large correlation (.281) is between the size of the medical group and academic practice membership. The context specificity of health care research acknowledges that academic practices tend to be very large multispecialty medical groups. However, neither variable will be eliminated because there may be explanatory power resulting from academic practice membership. For example, the quasi-governmental status of academic practices and the resulting funding mechanisms used to sustain them has not traditionally taken the usual competitive advantage strategic issues (e.g., profit motive) into account. Therefore, academic practice membership may help to explain selected findings from this study.

Summary of Multicollinearity Issues. The decision to not eliminate any variables that have somewhat high correlations should not pose any substantive problems for this study. The potential benefits of leaving the

somewhat highly correlated variables in this study outweigh the possible multicollinearity drawbacks.

Expected Relationships Between Variables

Now that the multicollinearity analysis reveals that all of the initial non-dependent variables will remain, the expected relationships between all of these variables is presented. A summary table indicating these expected relationships is shown on Table 4.12. This table shows only the expected direction of each bivariate relationship. It does not take into account variable interactions, including interactions as separate constructs and moderating variables.

Results and Interpretations of Research Question #2

Research question #2 asks: Are there environmental and/or organizational characteristics which predict an organization's membership in specific SIGs? The two specific propositions tested are discussed next. These results are shown on Table 4.13.

Proposition 2a—Findings

This broad proposition finds limited support in these data. As expected, environments perceived as being turbulent and having health care financed through capitation were associated with medical group membership

Table 4.12

Expected Relationships Between Variables

Variable	Type	Expected Relation to Structural Integration Groups	Expected Relation to Competitive Advantage
Competitive Advantage	Dependent	Not Applicable	Not Applicable
Structural Integration Group	Independent	Not Applicable	Positive (+)
Turbulent Environment	Independent	Positive (+)	Negative (-)
Collaborative Environment	Independent	Positive (+)	Negative (-)
Payor-Driven Environment	Independent	Positive (+)	Negative (-)
Capitation Environment	Independent	Positive (+)	Negative (-)
Existence of Strategic Plan	Independent	Positive (+)	Positive (+)
Size in FTE Physicians	Independent	Positive (+)	Positive (+)
Multispecialty Group	Independent	Positive (+)	Positive (+)
Academic Practice Plan	Independent	Positive (+)	Negative (-)
Gender (Male =1)	Control	There is no presumed relationship between control variables and any of the dependent and independent variables.	
Age	Control		
Education Level	Control		
Physician Executive	Control		

Table 4.13

Research Question #2—Findings

Test	Independent Variable(s)	Dependent Variable	Support	Adj R^2
Proposition 2a	Environmental Characteristics	Structural Integration Groups	Limited	5.8%
	Turbulence (t=4.55; p<.0001; direction ok) Collaboration (t=-.42; not significant) Payor-Driven (t=-.02; not significant) Capitation (t=4.97; p<.0001; direction ok)			
Proposition 2b	Organizational Characteristics	Structural Integration Groups	Strong	15.5%
	Strategic Plan (t=3.99; p<.001; direction ok) Size (t=4.45; p<.0001; direction ok) Multispecialty (t=5.69; p<.0001; direction ok) Acad Practice (t=2.38; p<.05; direction ok)			

in SIGs that had more partners and higher levels of partner interdependence. However, both collaboration and payor-driven were found to be non-significant.

Using the simultaneous entry regression method, the four environmental characteristics together are seen to be significant at the .0001 level ($F = 11.46$; $n = 685$). The adjusted R^2 indicates that they account for 5.8% of the total variance of SIGs. The tests for linearity, variance equality, and normality indicate that the regression equation assumptions are met.

Individually, only turbulence ($t = 4.55$; $p<.0001$) and capitation ($t = 4.97$; $p<.0001$) are statistically significant. Neither collaboration nor payor-driven has a significant relationship with SIG. Capitation has slightly more effect on SIGs than does turbulence (beta = .187 and .170, respectively). Both have positive signs, which means that a stronger presence of these environmental characteristics (i.e., a higher value for the variables) indicates more partners and higher interdependence. Of the four respondent characteristics used as control variables, only education level had a significant effect (positive; $p<.001$) on the relationship between environmental characteristics and SIGs.

This indicates that medical groups facing an uncertain environment attempt to compensate for that unknown by creating stability through interorganizational relationships. For example, the presence of the latest health care delivery financing mechanism, capitation, results in more

integration within the health care arena. Medical groups involved in capitated contracts have both more partners and higher levels of interdependence with their partners than medical groups operating in less capitated environments. This higher level of integration by medical groups when facing an environment of capitation may be due to the inherent sharing of treatment risk between the providers and the financing organizations. Sharing of risk results in more resources being devoted to monitoring the relationship, which can lead to higher levels of integration to reduce these monitoring costs.

These findings indicate that higher levels of interdependence with more partners is seen as a solution to the hyperturbulent environment facing health care organizations. The new problems continuously arising in health care come at such a pace that solutions cannot be created before the problem redefines itself. Medical groups evidently believe that by integrating, they are buffering themselves against the full effect of this hyperturbulent environmental paradigm.

Proposition 2b—Findings

This broad proposition finds very strong support in these data. As expected, all four organizational characteristics (i.e., existence of a strategic plan, organizational size, multispecialty designation, and academic practice plan status) were statistically significant predictors of medical group

membership in specific SIGs. For example, medical groups that had a strategic plan or were larger medical groups or were multispecialty or those with a designation as an academic practice plan all were associated with medical group membership in SIGs that had more partners and higher levels of partner interdependence.

Using the simultaneous entry regression method, the four organizational characteristics together are significant at the .0001 level ($F = 32.51$; $n = 685$). The adjusted R^2 indicates that they account for 15.5% of the total variance of SIGs. The tests for linearity, variance equality, and normality indicate that the regression equation assumptions are met.

Individually, medical group size ($t = 4.45$; $p<.0001$), multispecialty designation ($t = 5.69$; $p<.0001$), existence of a strategic plan ($t = 3.99$; $p<.001$), and academic practice plan status ($t = 2.38$; $p<.01$) are all statistically significant with SIG. Since these four variables are measured in different units, betas will be analyzed to determine which of the four organizational components has the largest effect on membership in SIGs. Betas are standardized coefficients which indicate the change expected in the dependent variable for a one unit change in the specific independent variable, all other things equal.

Based on an analysis of betas, multispecialty designation (beta = .214) has the highest effect on SIGs. This is followed by size (beta = .171) and

existence of a strategic plan (beta = .143). Academic practice status (beta = .087) has the least effect on the dependent variable of SIG.

All of these four organizational characteristics have positive betas, which indicates that a stronger presence of these characteristics indicates more partners and higher interdependence. Of the four control variables, only education level had a significant effect (positive; $p<.05$) on the relationship between organizational characteristics and SIG.

In summary, medical groups which are complex and analytical further reduce their autonomy as they add to their structural complexity to increase access to complementary resources.

In an effort to discover which environmental, organizational, and/or respondent characteristic has the largest effect on SIG membership, discriminant analysis of all twelve environmental, organizational, and respondent characteristics was performed. Since each of the twelve variables had a Wilks' lambda value greater than .75, discriminant analysis techniques were used next.

The discriminant analysis procedure produced three canonical functions, only two of which were significant at the .05 level. Using the standardized canonical function coefficients, four of the eight environmental and organizational variables were found to have the most effect on SIGs. These variables are (in order of decreasing importance): multispecialty designation; size; capitation; and academic practice plan status.

Results and Interpretations of Research Question #3

Research question #3 asks: Does membership in SIGs lead to organizational competitive advantage? Since the four propositions to this specific research question all involve the same two variables (i.e., SIGs and competitive advantage) and no other variables, the four propositions will be discussed together next. The findings are shown on Table 4.14.

Propositions 3a, 3ab, 3b, and 3d—Findings

While there is no support found for the expected direction of the relationships of the four propositions, there are still significant findings to discuss. Using the simultaneous entry regression method, the SIG variable is determined to be significant at the .01 level ($F = 10.59$; $n = 685$). The adjusted R^2 indicates that it accounts for 1.4% of the total variance of competitive advantage. The tests for linearity, variance equality, and normality indicate that the regression equation assumptions are met.

However, SIG has a negative regression coefficient (-.087), which indicates that as SIG increases, competitive advantage decreases. In other words, the more partners a medical group has, and the higher the level of partner interdependence, the lower medical group's competitive advantage!

Table 4.14

Research Question #3—Findings

Test	Independent Variable(s)	Dependent Variable	Support	Adj R^2
Proposition 3	Structural Integration Groups (t=-3.25; p<.01; direction not ok)	Competitive Advantage	Opposite	1.4%

	Mean CA Value	Predicted Effect on CA	Findings
Acceptor (Broad-Tightly Linked)	3.57	Highest	Lowest
Aggressor (Broad-Mixed-Linked)	3.62 (a)*	High-Intermed	Intermediate
Doubter (Broad-Loosely-Linked)	3.65 (b)	Intermediate	Intermediate
Resistor(Narrow-Loosely-Linked)	3.80 (a,b)	Lowest	Highest

*a & b are significantly different at .05 (p<.05)

This unexpected finding suggests that further analysis is warranted. An additional regression model was run, this time using three dummy variables instead of the SIG variable that has four values. This was performed to determine if perhaps only one or two of the SIG values were confounding the overall relationship between SIG and competitive advantage.

Using the simultaneous entry regression method, no further light is shed on this issue. Each of the three dummy variables exhibits a relationship with competitive advantage that is opposite of the expected relationship. This regression model showed significance at the .01 level ($F = 3.99$; $n = 685$) and the adjusted R^2 indicates that these dummy variables also account for 1.4% of the total variance of competitive advantage. Of the four control variables (i.e., respondent characteristics), only education level had a significant effect (negative; $p<.05$) on the relationship between SIG and competitive advantage.

Perhaps the first place to look for an explanation of this opposite finding is to examine a major assumption of this study—that structural linkages lead to competitive advantage in all industries. The context specificity of the data (i.e., the newness of integration in health care) may invalidate the presumed cause and effect relationship between SIGs and competitive advantage. It may be that the current health care environment

is not yet ready to support the contention that more tightly integrated collaboration should lead to higher competitive advantage.

To test the viability of this explanation, an analysis was made that combined hyperturbulent environment with SIG. The logic was that environmental circumstances in a hyperturbulent situation may combine with organizational membership in specific SIGs to jointly affect competitive advantage. Hyperturbulence was operationalized from the turbulent indicant (i.e., P9Q1) as a dichotomous variable. It has allowable values of 0 and 1, with 1 meaning that the respondent chose either 5, 6, or 7 on P9Q1. An ANOVA was performed that indicated there was no interaction effect ($F = 1.546$, $p < .25$) between a hyperturbulent environment and membership in SIGs when predicting competitive advantage.

In addition, for the two independent variables of hyperturbulence and SIGs in the same model, the ANOVA test showed significance at the .001 level ($F = 7.17$; $n = 663$), with an adjusted R^2 of 3.6% (i.e., the two variables account for 3.6% of the total variance of competitive advantage). In other words, the addition of hyperturbulence almost triples the explanatory power with only SIG (i.e., from 1.4% to 3.6%).

The next step is to acknowledge that there may be convincing arguments to be made regarding competitive advantage leading to SIGs. For example, health care organizations have been involved in informal structural linkages (e.g., referrals among physicians; physician privileges at hospitals,

etc.) since the beginning of the practice of medicine. However, some forms of collaboration (e.g., integrated delivery systems/networks) are still relatively new and are evolving as this study is being performed. Therefore, it may be too early to tell if these new collaborative structures actually have affected such a long term performance measure such as competitive advantage.

Another explanation for the unexpected SIG-performance relationship found in these data resides in the "chicken and the egg" concept. Perhaps it is not collaboration that leads to performance, but, instead, historical performance may lead to membership in selected SIGs. For example, poor performing medical groups may be representative of those medical groups that are, in fact, forming the most intense structural linkages. These poor performing practices may be acquired by other health care organizations or they may not have the resources or power to remain autonomous and are, reluctantly, joining with other organizations in order to create effectiveness from scope and scale economies.

An alternative explanation for why SIGs representing more partners and higher interdependence levels between partners may lead to lower competitive advantage is the inability of hospitals and physicians to set aside historic suspicions that interfere with synergistic potential (Goldsmith, 1993). These suspicions can be due to hospital administrator resentment toward physicians because of physician income levels, intellectual prowess of physicians, the physicians forcing of their input into management decisions,

and physicians being incapable of submitting to the authority of anyone, even a fellow physician (Goldsmith, 1993).

In addition, failure of highly integrated systems (i.e., lower competitive advantage) can occur when one partner becomes, in essence, a captive audience to the other partner (Miles and Snow, 1992). In other words, the captive partner's focus becomes too narrow to contribute to the value chain and therefore, the captive partner is seen as a commodity supplier to the system. This can cause a loss of competitive advantage to the captive partner.

Another theory that can explain this unexpected SIG-competitive advantage relationship is provided by bandwagon theory, which attempts to explain how innovations become diffused. Abrahamson and Rosenkopf (1993) use bandwagon theory to help explain how bad innovations become commonplace. For example, regarding the results of this study, it could be that the concept of integration has become so pervasive in the health care literature that health care organizations are "jumping on the bandwagon" and joining or creating all types of health collaborative efforts, without regard to the actual benefits these integration efforts are presumed to bring with them. So (using Abrahamson and Rosenkopf's theory) the question is: Are highly collaborative efforts in health care just another bandwagon rolling by that medical groups are jumping even though there is no organizational competitive advantage to be obtained?

All of these explanations for the unexpected findings notwithstanding, there do exist performance differences between the four distinct SIGs. Using one-way analysis of variance (SPSS 6.1 One-Way ANOVA), it was revealed that there are two significant differences ($p<.05$) between SIG types: (1) between resistant collaborators (mean = 3.80) and cautious collaborators (mean = 3.65); and (2) between resistant collaborators (mean = 3.80) and master collaborators (mean = 3.62). In both of these instances, the competitive advantage mean for resistant collaborators was higher than for the other SIG types.

In other words, the only significant competitive advantage differences existed between organizations which had "few" and "many" partners, as long as the "low" level of partner interdependence was present. That is, among those medical groups involved in structural relationships with low levels of partner interdependence, those organizations with few partners exhibited higher levels of competitive advantage than did those practices with many partners.

In addition, using the six individual competitive advantage indicants instead of the multi-item construct of MeanCA, it was discovered that SIG can predict certain types of competitive advantage better than other types. A multivariate analysis of variance (MANOVA), with a corresponding discriminant analysis, was performed using SIGs as the independent variable and the six individual competitive advantage indicants as the

dependent variables. These results indicate that SIG has the largest effect of the competitive advantage indicant of service orientation. Secondarily, SIG has some effect on clinical quality, profitability, and cost effectiveness. SIG does not really effect market share or organizational survival.

Results and Interpretations of Research Question #4

Research question #4 asks: Are there environmental and/or organizational characteristics which predict an organization's competitive advantage? The two specific propositions tested are discussed next. The findings are shown on Table 4.15.

Proposition 4a—Findings

This broad proposition finds limited support in this study's data. Non-changing environments are represented in this study by low values on the indicants of turbulence, collaboration, payor-driven, and capitation. Using the simultaneous entry regression method, the four environmental characteristics together are seen to be significant at the .0001 level ($F = 8.11$; $n = 685$). The adjusted R^2 indicates that they account for 4.0% of the total variance of SIGs. The tests for linearity, variance equality, and normality indicate that the regression equation assumptions are met.

Table 4.15

Research Question #4—Findings

Test	Independent Variable(s)	Dependent Variable	Support	Adj R^2
Proposition 4a	Environmental Characteristics	Competitive Advantage	Limited	4.0%
	Turbulence (t=-5.62; p<.0001; direction ok) Collaboration (t=-.11; not significant) Payor-Driven (t=1.42; not significant) Capitation (t=-.57; not significant)			
Proposition 4b	Organizational Characteristics	Competitive Advantage	Mixed	4.7%
	Strategic Plan (t=2.19; p<.05; direction ok) Size (t=.08; not significant) Multispecialty (t=-3.65; p<.01; direction not ok) Acad Practice (t=-9.30; p<.0001; direction ok)			

Individually, only turbulence ($t = -5.62$; $p<.0001$) is statistically significant. In addition, turbulence exhibits the expected negative sign, which indicates that a lower presence of turbulence (i.e., a higher presence of stability) indicates a higher level of competitive advantage. Of the four respondent characteristics used as control variables, only education level had a significant effect (negative; $p<.05$) on the relationship between environmental characteristics and competitive advantage.

This means that non-changing health care environments inherently offer stability and certainty that partially explains the competitive advantage of medical groups.

Proposition 4b—Findings

This broad proposition finds mixed support in these data. Using the simultaneous entry regression method, the findings show that the four organizational characteristics together are significant at the .0001 level ($F = 30.58$; $n = 685$). The adjusted R^2 indicates that they account for 14.7% of the total variance of SIGs. The tests for linearity, variance equality, and normality indicate that the regression equation assumptions are met.

Individually, only three of the four are statistically significant with competitive advantage. The results show that academic practice plan status ($t = -9.30$; $p<.0001$), multispecialty designation ($t = -3.65$; $p<.001$), and

existence of a strategic plan ($t = 2.19$; $p<.05$) are statistically significant. In addition, academic practice plan designation (beta = -.343) has the highest effect on competitive advantage, with that existence of a strategic plan (beta = .079) having the smallest effect of the three significant variables.

The signs of these statistically significant relationships indicate that: (1) academic practice designation results in lower competitive advantage (as expected); (2) multispecialty designation results in lower competitive advantage (not expected); and (3) existence of a formal strategic plan results in higher competitive advantage (as expected). None of the four respondent characteristics (i.e., control variables) had a significant effect on the relationship between organizational characteristics and competitive advantage.

It is a little surprising that medical group size did not have a significant relationship with competitive advantage. It was expected that larger medical groups would have more slack resources with which to concentrate on competitive advantage issues, and, hence, have relatively higher competitive advantage. Even prior research has shown that organizational size (Boyd, 1991; Miller and Cardinal, 1994) does, indeed, affect organizational performance. However, these data do not offer any further evidence of this relationship.

Medical groups classified as academic practice plans are shown to have lower organizational performance. It has been argued that academic practice

plans cannot compete on the basis of cost because their typical quasi-governmental status dictates that they must provide a teaching function, which often costs more than it brings in. In addition, these types of medical groups often see a sicker mix of patients (e.g., because of the ties they often have with county hospitals) and have inefficient practice styles (e.g., the teaching function often leads to more tests in order to train the students) (Fox and Wasserman, 1993).

In this study, medical groups with a strategic plan were associated with higher levels of competitive advantage. The existence of a strategic plan implies that some type of formal strategic planning process was used to identify internal strengths and weaknesses and external threats and opportunities. This process has been hypothesized by many researchers to lead to better performance (Boyd, 1991; Bruton et al., 1995; Miller and Cardinal, 1994).

However, it has also been argued that strategic planning does not affect performance since all organizations: (1) have access to the same planning techniques (Powell, 1992); and (2) will learn the same information from the planning process (Starbuck, 1993). Often, even in the face of the ambiguous empirical relationships between planning and performance, researchers suggest that the planning process still produces value for the organization because it forces the organizational participants to analyze their respective environments.

Therefore, those medical groups that have strategic plans presumably went through various formal steps to learn about their particular environments, including analysis of consequences resulting from those environments. Support for this contention is argued by Meyer (1982) who found that hospitals which had prepared for change were better able to withstand a severe environmental jolt (i.e., introduction of new payment mechanism) than those who had not planned. This study reinforces the value of strategic planning.

Results and Interpretations of the Overall Model

The overall model to be tested is shown in the previously discussed Figures 2.1 and 4.3. This model has competitive advantage as the dependent variable and all the other variables as independent variables. Testing of this overall model is performed to find the most parsimonious regression equation for this study's data. The simultaneous entry regression method resulted in the statistics shown on Table 4.16. All the variables together are significant at the .0001 level ($F = 12.05$; $n = 685$). The adjusted R^2 indicates that they account for 17.3% of the total variance of competitive advantage. The tests for linearity, variance equality, and normality indicate that the regression equation assumptions are met.

Individually, only four variables were significant. Academic practice plan designation ($t = -9.15$; $p<.0001$), presence of a turbulent environment

Table 4.16

Regression Results of the Overall Model

Dependent Variable: MeanCA

Independent Variables: SIG Turb Collab Paydrvn Capit Plan Size Multi Acad Gender Age Educ Phys

R Square .18906 Adjusted R Square .17337

Analysis of Variance:

	DF	Sum of Squares	Mean Square
Regression	13	57.49965	4.42305
Residual	672	246.63065	.36701

F = 12.05158 Signif F = .0000

Variable	T	Sig T
SIG	-0.64	.5221
Turb	-4.98	.0000
Collab	0.16	.8698
Paydrvn	1.70	.0904
Capit	-0.40	.6906
Plan	2.78	.0056
Size	.65	.5183
Multi	-2.61	.0094
Acad	-9.15	.0000
Gender	.11	.9149
Age	-0.31	.7581
Educ	-0.97	.3337
Phys	.57	.5674
(Constant)	20.18	.0000

(t = -4.98; p<.0001), existence of a formal strategic plan (t = 2.78; p<.01), and multispecialty designation (t = -2.61; p<.01) are all statistically significant with competitive advantage. Academic practice plan designation (beta = -.339) has the highest effect on competitive advantage, followed by presence of a turbulent environment (beta = -.182). Finally, both multispecialty designation (beta = -.101) and existence of a strategic plan (beta = .101) had the next highest effect on competitive advantage. None of the control variables (i.e., respondent characteristics) had a significant effect on competitive advantage.

The findings shown on Table 4.17 indicate that certain environmental and organizational characteristics are related to a determination of organizational competitive advantage. Specifically, stable environments, existence of a strategic plan, non-multispecialty designation, and non-academic practice plan designation result in higher competitive advantage.

A possible reason why the major independent variable, organizational membership in SIGs, did not have a statistically significant relationship with organizational competitive advantage has its roots in path dependence theory. For example, this concept of path dependence allows environmental and organizational characteristics to have greater input into the competitive advantage equation. As discussed before, tightly coupled, highly interdependent structural linkages in health care may not have had enough time to create either a positive or negative relationship when compared to the

Table 4.17

Results of Test of Overall Model

Test	Independent Variable(s)	Dependent Variable	Adj R^2
Overall Model	**Structural Integration Groups** (t=-.64; not significant)		
	Environmental Characteristics Turbulence (t=-4.98; p<.0001; direction ok) Collaboration (t=.16; not significant) Payor-Driven (t=1.70; not significant) Capitation (t=-.40; not significant)		
		Competitive Advantage	17.3%
	Organizational Characteristics Strat Plan (t=2.78; p<.01; direction ok) Size (t=.65; not significant) Multispec (t=-2.61; p<.01; direction not ok) Acad Pract (t=-9.15; p<.0001; direction ok)		
	Respondent Characteristics Gender (t=.11; not significant) Age (t=-.31; not significant) Education (t=-.97; not significant) Physician (t=.57; not significant)		

large, historical effects of selected environmental and organizational characteristics.

In an effort to more fully understand this relationship between SIGs and competitive advantage, each of the six competitive advantage indicants was regressed using all of this study's variables. This analysis is undertaken to determine if the effects of any of the individual indicants is canceled out when the multi-item construct of the mean of competitive advantage is used as the dependent variable.

The regression equation with clinical quality as the competitive advantage measure was not found to be significant at the .05 level ($F = 1.58$; $n = 685$). For service orientation as the competitive advantage measure, however, the regression equation with all the independent variables together was significant at the .0001 level ($F = 13.46$; $n = 685$). The adjusted R^2 indicates that the twelve independent variables account for 19.1% of the total variance of service orientation. The six statistically significant variables are: academic practice plan designation ($t = -8.51$; $p<.0001$); presence of a turbulent environment ($t = -3.21$; $p<.01$); existence of a formal strategic plan ($t = 2.84$; $p<.01$); multispecialty designation ($t = -2.92$; $p<.01$); education level of the respondent ($t = -2.21$; $p<.05$); and presence of a payor-driven environment ($t = 2.42$; $p<.05$).

When market share is used as the competitive advantage measure, significance is found at the .0001 level ($F = 5.63$; $n = 685$). The adjusted R^2

indicates that the independent variables account for 8.1% of the total variance of competitive advantage. Individually, only three variables were significant. Academic practice plan designation ($t = -7.10$; $p<.0001$), presence of a turbulent environment ($t = -2.66$; $p<.01$), and existence of a formal strategic plan ($t = 2.35$; $p<.05$) are all statistically significant with competitive advantage.

For the competitive advantage measure of profitability, the regression equation was also significant at the .0001 level ($F = 6.82$; $n = 685$), with an adjusted R^2 of 9.9%. The three statistically significant independent variables are: academic practice plan designation ($t = -5.62$; $p<.0001$); presence of a turbulent environment ($t = -4.89$; $p<.0001$); and multispecialty designation ($t = -3.18$; $p<.01$). Using cost effectiveness as the competitive advantage measure, significance is found at the .0001 level ($F = 12.51$; $n = 685$). The adjusted R^2 is 17.9%. Only three independent variables are significant: academic practice plan designation ($t = -10.01$; $p<.0001$); presence of a turbulent environment ($t = -4.36$; $p<.0001$); and existence of a formal strategic plan ($t = 2.64$; $p<.01$).

Finally, the regression equation using organizational survival as the competitive advantage measure was found to be significant at the .0001 level ($F = 4.35$; $n = 685$), with adjusted $R^2 = 6.0\%$. Again, only three independent variables are significant: academic practice plan designation ($t = -5.75$;

p<.0001); presence of a turbulent environment (t = -3.49; p<.001); and existence of a formal strategic plan (t = 2.88; p<.01).

In summary, there are several common independent variables which are significant predictors of the five distinct competitive advantage measures that had significant F values (i.e., service orientation, market share, profitability, cost effectiveness, and organizational survival). Academic practice plan designation and presence of a turbulent environment are significant vis-à-vis all five of these measures. Existence of a formal strategic plan is significant with four competitive advantage measures. Multispecialty classification is significant with two of these measures. The remainder of the significant predictor variables are only statistically significant with one of the competitive advantage measures.

These four independent variables (i.e., academic practice plan designation, presence of a turbulent environment, existence of a formal strategic plan, and multispecialty classification) are the same four significant variables when the multi-item scale measure of competitive advantage was used. This indicates that the other eight independent variables probably are not that valuable to determining competitive advantage of this study's medical groups. Rather, a more parsimonious model can be suggested that has only these four independent variables, while using the multi-item scale of competitive advantage as the dependent variable.

In other words, academic practice plan designation, presence of a turbulent environment, existence of a formal strategic plan, and multispecialty classification predict the mean competitive advantage. The regression test of this potentially parsimonious overall model indicate significance at the .0001 level ($F = 38.18$; $n = 685$), with an adjusted R^2 of 17.8%. The four independent variables are all significant at the .01 level.

The adjusted R^2 for this parsimonious model is actually higher than for the all-inclusive model (i.e., 17.8% versus 17.3%, respectively). Therefore, it is clear that this suggested model of only four independent variables is a valid and parsimonious model of organizational competitive advantage.

Chapter Summary

This chapter presented all of this study's data analysis issues, leading up to and including the testing of the propositions. First, the chapter began with a discussion of the generalizability of the results based on an analysis of selected descriptive statistics of the dataset. Next, a new, multi-item construct was created to represent one measure of competitive advantage

This was followed by an analysis of multicollinearity of the non-dependent variables, which resulted in no variables being excluded from this study. It was then empirically discovered that three of the *a priori*,

conceptually created SIGs were found in this study's data. In addition, a conceptually new SIG was also empirically generated from these data.

Next, the results and interpretations of all the other propositions was presented. Regarding the major independent variable of SIGs, the findings were somewhat surprising. It was found that, although membership in SIGs was a statistically significant predictor of competitive advantage, it had the opposite effect than hypothesized.

Finally, a parsimonious, new model was discovered that resulted in only four independent variables predicting the mean competitive advantage. The next chapter discusses the benefits arising from this study, limitations inherent in the study, and directions for future research.

CHAPTER V

CONTRIBUTIONS, LIMITATIONS, AND FUTURE DIRECTIONS

Chapter Overview

This study has attempted to broaden our understanding of the relationship between structural integration groups (SIGs) and competitive advantage. This final chapter discusses several contributions and limitations of this study. It concludes with recommendations for future research.

Contributions of this Study

This study contributes insight into several topics identified by researchers that would benefit from further examination: (a) provide an understanding regarding the factors (i.e., number of partners and level of partner interdependence) that give rise to or impede cooperative relationships between organizations (Ring and Van de Ven, 1994); (b) determine how organizations establish competitive advantage (Fahey and Christianson, 1986); and (c) incorporate a context specific knowledge (i.e., the health care industry) to study the context free problem (Blair and Hunt, 1986; Huff and Reger, 1987; Montgomery et al., 1989) of the relationship between interorganizational relationships (IORs) and performance. The specific major contributions of this study are discussed next.

Theoretical and Empirical Creation of SIGs. The conceptual blending or combining of the two distinct dimensions of number of partners and level of partner interdependence into theoretical SIGs provides a very important contribution to the context free literature. In addition, the performance implications of these new SIGs ties in the strategic nature of SIGs.

The actual existence of these SIGs may be the most important contribution of this study. This has implications for how future strategic research is conducted. The actual existence of SIGs in this study allowed for the examination of how these structural linkage patterns affect organizational competitive advantage. There are few studies that have actually entered into this territory of how structural linkages affect organizational performance. This study, along with two very recent articles (Dyer, 1996; Mitchell and Singh, 1996), indicates that SIGs may become one of the new strategic variables of choice in future organizational research.

Different Methodology to Study IORs. The use of statistical clustering techniques to create groups of organizations which share similar structural linkages represents a different methodology to study multi-organizational relationships. IORs have been previously studied using such techniques as network analysis, parent-subsidiary earnings and stock price analysis, time before the subsidiary is divested, etc. These techniques have used procedures other than clustering to assess propositions and hypotheses.

Focus on Medical Groups. This study explored the health care industry using an organizational form (i.e., medical groups) other than the oft-studied hospital (Blair and Boal, 1991). Medical groups have always been an important, yet understudied, component of health care delivery. Their importance is increasing in delivery as the financing mechanisms of health care go through major revolutionary change. For example, the new financing mechanism, capitation, is forcing many medical groups to absorb a larger share of the financial liability of treating patients. This has serious consequences to the cost, quality, and access issues so important to patients, policy makers, and, of course, health care providers.

This expansion of health care organizational units of analysis from primarily hospitals to the understudied medical groups offers interesting structural issues. For example, most hospitals are rather large organizations with established hierarchical structures that rely strongly on rules and procedures. Most medical groups, however, are professional partnerships with strong emphases on professional collegiality and individual physician autonomy. In fact, medical groups are much like the P-2 organizational form (i.e., professional partnership per Greenwood, Hinings, and Brown, 1990). Therefore, the use of medical groups opens up an avenue of research between different types of internal structures of intra-industry organizations.

Implications for Practitioners

From a context specific approach, this study provides to health care executives very clear illustrations of how structural linkages are related to selected environmental and organizational characteristics. By using actual, real world structural linkages in this study (e.g., alliances between health care organizations such as medical groups, hospitals, and managed care organizations), health care executives are better able understand the types of strategic partnering choices they have available in different types of environments.

Selected environmental and organizational characteristics seem to predict competitive advantage far more than do structural linkages. Alternative explanations for this weak structural linkage-competitive advantage relationship notwithstanding, historical organizational characteristics and level of current environmental turbulence seem to be better predictors of current organizational competitive advantage.

This study suggests that perhaps allocation of scarce resources for environmental scanning may be warranted. However, health care executives are urged to exercise caution when entering IORs. This study does not provide clear evidence that SIGs are beneficial. In fact, the costs of creating and maintaining IORs has not even been assessed.

The results do indicate, though, that all medical groups are not alike. They differ on their number of partners, on the levels of partner

interdependence they practice, and on level of competitive advantage. In addition, it is shown that academic practice plans do, in fact, possess the lowest level of competitive advantage. This could be due to such factors as: dysfunctional incentive policies (e.g., rewarding research and development, even though it is generally not cost effective); acting as the training ground for new physicians (i.e., training facilitates often incur extra testing expenses in order for students to learn); etc.

Limitations of this Study

As with all research, this study has limitations. Limitations are those uncontrolled factors that may affect the outcomes of the study. One important limitation is that this study is a secondary analysis of existing data. The data available to test this model is, therefore, necessarily constrained. For example, when studying IORs, there are many potential content factors that can affect competitive advantage. These content factors include: the caliber and quality of the partners; the size of the partner; the extent of sharing of complementary resources; motivation of the partners; etc. Unfortunately, those types of content factors were not available from this existing dataset.

Another limitation related to secondary analyses is that the variables of interest are often gathered in the same time period. For this study, that means both structural linkages and competitive advantage are measured in

the same time period. This raises the question of how long the structural linkages need to be in place prior to their ability to affect competitive advantage. In addition, using secondary data from only one source results in there being no independent data with which to objectively verify environmental or organizational characteristics.

Secondary analyses involving questionnaires also have built-in limitations such as length of questionnaire instrument, respondent self-report biases, collection of cross sectional data, etc. For example, this study's questionnaire was quite lengthy, being 16 pages in length with over 600 individual responses. The average length of time to complete was one hour, with the maximum time to complete being five hours.

While all of these inherent limitations of secondary analyses are important, the actual effect of these types of limitations is not clear because many researchers believe the benefits of secondary research outweigh the theoretical limitations (Dixon, 1994).

Another limitation involves the actual knowledge level of each respondent vis-à-vis the issues asked about in the questionnaire. For example, when informants supply performance data, it may be biased due to the informant's opinions of the value of their contribution to whatever relationship is being queried (Miller and Cardinal, 1994). In addition, self-report effects can bias non-demographic data collected using survey-type methods (Wagner and Crampton, 1993).

For this specific study, these self-report effects can include poor quality answers due to the respondents not being fully aware of the issues explored in the particular questionnaire instrument or due to the respondents' inabilities to accurately assess the current state of the organization. However, these types of self-report effects are perhaps lessened in this study because all the respondents are affiliated with the Medical Group Management Association's professional college.

This affiliation with the credentialing arm of the health care administration profession indicates that these respondents are probably in the best position to not only understand the issues within the questionnaire, but to also accurately understand the current state of their respective organizations. They may also be the most knowledgeable about their health care environment and may actually be the direction setters for their industry.

Another potential limitation of this study is that multiple respondents from the same organization may have answered the mailed questionnaire. Although there was no mechanism to control for this potential problem, the likelihood of this "multiple respondent" problem is probably fairly small since MGMA's member organizations typically have only one individual member. Exceptions to that include the larger academic practices and multispecialty groups, which sometimes have several organizational employees who are individual MGMA members.

No attempt has been made to ascertain any organizational performance data other than competitive advantage. To the extent that competitive advantage is not an adequate measure of organizational performance, this is a limitation. Also, other causes of structural linkages are not explored or taken into account in this study. For example, as discussed earlier, it could be that structural linkages are being formed in health care simply due to bandwagon effects or for some other reason besides competitive advantage.

Finally, from a methodological perspective, it has been argued by many that clustering techniques will cluster almost anything, as long as some correlation between the variables exist (Bailey, 1994; Barney and Hoskisson, 1990). Sometimes, the resultant clusters are not natural clusters. In fact, they may not even be artificial clusters. They may, instead, be fictional clusters (Bailey, 1994). However, the more conceptually linked the variables are through theoretical concepts, the more likely that the clusters are natural or true. Although the SIGs derived from the empirical clustering techniques were interpreted independently from the actual technique used to create the conceptual SIGs, there is still the "cluster anything" problem that haunts the use of clustering methodologies.

Recommendations for Future Research

How do the results of this study fit into tomorrow's research agenda? There are many potential avenues. For example, the concept of SIGs naturally leads to a discussion of the most appropriate governance mechanism of multi-entity organizational structures. Governance mechanisms are necessary that will: (1) gather information on resource inputs and output needs of multiple and varied stakeholders; (2) attend to these identified inputs and outputs so ensure stakeholders are at least minimally satisficed; and (3) ensure that each partner organization works for the common good, while simultaneously being allowed to operate autonomously to explore individual goals.

Governance mechanisms that are designed to achieve these three governance issues include web managers (Bartlett and Ghoshal, 1993), strategic centers (Lorenzoni and Baden-Fuller, 1995), and overarching boards of directors (Savage, Taylor, Rotarius, and Buesseler, 1997). In fact, each of these approaches to multi-institutional governance are intended to represent the parenting advantage (Campbell, Goold, and Alexander, 1995a, 1995b) presumably inherent in governing distinct and autonomous entities that have become tightly linked with other autonomous entities.

Another avenue of potential follow on research involves the study by Nix et al. (1996). They draw a distinction between two different forms of integrated delivery structures: (1) loosely integrated delivery networks of

medical practices, hospitals, and managed care organizations; and (2) fully integrated delivery systems. They studied the creation of bundles of skills that are created in these integration efforts. This study adds to their findings by indicating that there do exist specific SIGs that do possess different membership criteria (i.e., factors of membership). Therefore, a follow up study could incorporate the concept of bundles of skills with a test of the existence of these skills in the specific SIGs.

A further extension of this study could be undertaken that includes a more fine grained approach to studying organizational structural linkages. For instance, instead of using a dichotomous variable (i.e., yes or no), a scale from 1-5 would allow for more variance in the SIG variable. In addition, perhaps a more detailed breakdown of the existing structural linkage indicants would eliminate potential offsetting types of linkages. Additional variables to include in a future study of these variables could include: a measure of anticipated competitive advantage to be gained by today's structural linkages; a variable to asses the length of time in the various types of structural linkages to assess cause and effect relationships; geographical information to assess the regional effects of various structural linkages (this would improve generalizability); and addition of performance data to allow an independent assessment of actual organizational competitive advantage.

Future research could include an analysis of the role that individuals play in creating and maintaining relationships between organizations

(Seabright, Levinthal, and Fichman, 1992). This individual effect could be analyzed from several perspectives, including social network theory, power and control issues, negotiating strategies, or strategic stakeholder management theory. Since the data used in this study came from a questionnaire designed around the concept of strategic stakeholder management (including concepts of stakeholder diagnosis and stakeholder management strategy, as created and discussed by Blair and Fottler, 1990), there exist opportunities to integrate SIGs with stakeholder management concepts.

For example, by combining various stakeholder management variables with structural linkage variables, perhaps a macro view of how organizations strategically manage their fellow SIG members could result. This could lead to the following types of research questions: Is SIG membership voluntary or forced?; Are the goals and values of the partners the same?; What effect does the SIG performance have on individual partner performance?; etc.

Another future research avenue would be to explicitly examine the relationship between SIGs and strategic groups. It was suggested in this study that SIGs and strategic groups represent different strategic concepts. By analyzing both types of classifications schemes in the same dataset, it may be possible to determine if these two constructs are actually distinct or if one is a subset of the other.

Chapter Summary

This chapter tied the information presented in earlier chapters together. It began by discussing the contributions of this study, including the conceptual and empirical creation of SIGs. Next, the practical implications of these contributions was presented. This was followed by an analysis of the limitations inherent in this study. Finally, several recommendations were offered to guide researchers in their future study of SIGs.

REFERENCES

Abrahamson, E. and L. Rosenkopf. 1993. Institutional and competitive bandwagons: Using mathematical modeling as a tool to explore innovation diffusion. *Academy of Management Review.* v18:3 487-517.

Ackerman, F.K., III. 1992. The movement toward vertically integrated regional health systems. *Health Care Management Review.* v17:3 81-88.

Aldenderfer, M.S. and R.K. Blashfield. 1985. *Cluster Analysis.* Beverly Hills, CA: Sage Publications, Inc.

Arthur Andersen and Co. 1991. *The Future of Healthcare: Physician and Hospital Relationships.* Dallas, TX: Arthur Andersen and Co.

Auster, E.R. 1994. Macro and strategic perspectives on interorganizational linkages: A comparative analysis and review with suggestions for reorientation. *Advances in Strategic Management.* v10B 3-40.

Bailey, K.D. 1994. *Typologies and Taxonomies: An Introduction to Classification Techniques.* Thousand Oaks, CA: Sage Publications, Inc.

Barney, J.B. 1991. Firm resources and sustained competitive advantage. *Journal of Management.* v17:1 99-120.

Barney, J.B. 1995. Looking inside for competitive advantage. *Academy of Management Executive.* v9:4 49-61.

Barney, J.B. and R.E. Hoskisson. 1990. Strategic groups: Untested assertions and proposals. *Managerial and Decision Economics.* v11 187-198.

Bartlett, C. A. and S. Ghoshal. 1993. Beyond the M-Form: Toward a managerial theory of the firm. *Strategic Management Journal.* v14:Winter 23-46.

Bergquist, W., J. Betwee, and D. Meuel. 1995. *Building Strategic Relationships.* San Francisco: Jossey-Bass Publishers.

Bigelow, B. and M. Arndt. 1991. Ambulatory care centers: Are they a competitive advantage? *Hospital and Health Services Administration.* v36:3 351-364.

Black, J.A. and K.B. Boal. 1994. Strategic resources: Traits, configurations and paths to sustainable competitive advantage. *Strategic Management Journal.* v15:Summer 131-148.

Blair, J.D. and K.B. Boal. 1991. Strategy formation processes in health care organizations: A context specific examination of context free strategy issues. *Journal of Management.* v17:2 305-344.

Blair, J.D. and M.D. Fottler. 1990. *Challenges in Health Care Management: Strategic Perspectives for Managing Key Stakeholders.* San Francisco, CA: Jossey-Bass Publishers.

Blair, J.D. and M.D. Fottler. 1997. *Navigating Health Care's Strategic Web: Leadership Challenges and Strategic Choices.* San Francisco, CA: Jossey-Bass Publishers and Medical Group Management Association. In press.

Blair, J.D., M.D. Fottler, A.R. Paolino and T.M. Rotarius. 1995. *Medical Group Practices Face the Uncertain Future: Challenges, Opportunities and Strategies.* Englewood, CO: Center for Research in Ambulatory Health Care Administration.

Blair, J.D. and J.G. Hunt. 1986. Getting inside the head of the management researcher one more time: Context free and context specific orientations in research. *Journal of Management.* v12:2 147-166.

Blair, J.D., T.W. Nix, J.A. Buesseler, S.B. Dymond and P. Kiecker. 1994. Achieving competitive advantage through and within integrated health care networks: Synthesizing and applying firm resource and stakeholder management theory. Presented to the Health Care Administration Division at the Academy of Management annual meeting in August, Dallas, TX.

Blair, J.D., C.R. Slaton and G.T. Savage. 1990. Hospital-physician joint ventures: A strategic approach for both dimensions of success. *Hospital and Health Services Administration.* v35:1 3-26.

Borys, B. and D.B. Jemison. 1989. Hybrid arrangements as strategic alliances: Theoretical issues in organizational combinations. *Academy of Management Review.* v14:2 234-249.

Boyd, B.K. 1991. Strategic planning and financial performance: A meta-analytic review. *Journal of Management Studies.* v28:4 353-374.

Browning, L.D., J.M. Beyer and J.C. Shetler. 1995. Building cooperation in a competitive industry: SEMATECH and the semiconductor industry. *Academy of Management Journal.* v38:1 113-151.

Brumagin, A.L. 1994. A hierarchy of corporate resources. *Advances in Strategic Management.* v10A 81-112.

Bruton, G.D., B.M. Oviatt and L. Kallas-Bruton. 1995. Strategic planning in hospitals: A review and proposal. *Health Care Management Review.* v20:3 16-25.

Buchko, A.A. 1994. Barriers to strategic transformation: Interorganizational networks and institutional forces. *Advances in Strategic Management.* v10B 81-106.

Burns, L.R. and D.P. Thorpe. 1993. Trends and models in physician-hospital organization. *Health Care Management Review.* v18:4 7-20.

Cameron, C. 1995. Military managed care. *Health Texas.* November: 1, 4-7.

Campbell, A., M. Goold and M. Alexander. 1995a. The value of the parent company. *California Management Review.* v38:1 79-97.

Campbell, A., M. Goold and M. Alexander. 1995b. Corporate strategy: The quest for parenting advantage. *Harvard Business Review.* v73:2 120-132.

Carroll, G.R. 1993. A sociological view on why firms differ. *Strategic Management Journal.* v14:4 237-249.

Castrogiovanni, G.J. 1991. Environmental munificence: A theoretical assessment. *Academy of Management Review.* v16:3 542-565.

Cave, D.G. 1995. Vertical integration models to prepare health systems for capitation. *Health Care Management Review.* v20:1 26-39.

Cerne, F. 1993. Prepared for uncertainty? *Hospitals and Health Networks.* (August 20) 22-25.

Cerne, F. 1994. The fading stand-alone hospital. *Hospitals and Health Networks.* (June 20) 28-33.

Coddington, D.C., K.D. Moore and E.A. Fischer. 1993. Integrated health care systems: The key characteristics. *Medical Group Management Journal.* v40:6 76-80.

Coddington, D.C., K.D. Moore and E.A. Fischer. 1994. *Integrated Health Care: Reorganizing the Physician, Hospital and Health Plan Relationship.* Englewood, CO: Medical Group Management Association.

Coddington, D.C., K.D. Moore and E.A. Fischer. 1996. *Making Integrated Health Care Work.* Englewood, CO: Center for Research in Ambulatory Health Care Administration.

Coile, R.C., Jr. 1994. *The New Governance: Strategies for an Era of Health Reform.* Ann Arbor, MI: Health Administration Press.

Collis, D.J. 1994. How valuable are organizational capabilities? *Strategic Management Journal.* v15:Winter 143-152.

Collis, D.J. and C.A. Montgomery. 1995. Competing on resources: Strategy in the 1990s. *Harvard Business Review.* v73:4 118-128.

D'Aunno, T.A. and H.S. Zuckerman. 1987. A life-cycle model of organizational federations: The case of hospitals. *Academy of Management Review.* v12:3 534-545.

Daft, R.L. and A.Y. Lewin. 1993. Where are the theories for the new organizational forms? An editorial essay. *Organization Science.* v4:4 i-vi.

Devanna, M.A. and N. Tichy. 1990. Creating the competitive organization of the 21st century: The boundaryless corporation. *Human Resource Management.* v29:4 455-471.

Devers, K.J., S.M. Shortell, R.R. Gillies, D.A. Anderson, J.B. Mitchell and K.L.M. Erickson. 1994. Implementing organized delivery systems: An integration scorecard. *Health Care Management Review*. v19:3 7-20.

Dierickx, I. and K. Cool. 1989. Asset stock accumulation and the sustainability of competitive advantage. *Management Science*. v35:12 1504-1514.

Dixon, R.D. 1994. *Performance Homogeneity Among Strategic Groups' Constant Member Firm Sets and Shifting Member Firm Sets in the Banking Industry*. Ph.D. Dissertation. Texas Tech University.

Duncan, W.J., P.M. Ginter and L.E. Swayne. 1995. *Strategic Management of Health Care Organizations, 2nd Edition*. Cambridge, MA: Blackwell.

Dyer, J.H. 1996. Specialized supplier networks as a source of competitive advantage: Evidence from the auto industry. *Strategic Management Journal*, v17 271-291.

Dymond, S.B., T.W. Nix, T.M. Rotarius, and G.T. Savage. 1995. Why do key integrated delivery stakeholders really matter? Assessing control, coalitions, resources and power. *Medical Group Management Journal*, v42:6 (November/December) 26-38.

Eisenhardt, K.M. and L.J. Bourgeois, III. 1988. Politics of strategic decision making in high-velocity environments: Toward a mid-range theory. *Academy of Management Journal*. v31:4 737-770.

Fahey, L. and H.K. Christensen. 1986. Evaluating the research on strategy content. *Journal of Management*. v12:2 167-183.

Fottler, M.D. 1987. Health care organizational performance: Present and future research. *Journal of Management*. v13:2 367-391.

Fox, P.D. and J. Wasserman. 1993. Academic medical centers and managed care: Uneasy partners. *Health Affairs.* v12:1 85-93.

Gillies, R.M., S.M. Shortell, D.A. Anderson, J.B. Mitchell and K.L. Morgan. 1993. Conceptualizing and measuring integration: Findings from the health systems integration study. *Hospital and Health Services Administration.* v38:4 467-489.

Goes, J.B. and C.L. Zhan. 1995. The effects of hospital-physician integration strategies on hospital financial performance. *Health Services Research.* v30:4 507-530.

Gold, M, L. Nelson, T. Lake, R. Hurley and R. Berenson. 1995. Behind the curve: A critical assessment of how little is known about arrangements between managed care plans and physicians. *Medical Care Research and Review.* v52:3 307-341.

Goldsmith, J. 1993. Hospital/physician relationships: A constraint to health reform. *Health Affairs.* v12:3 160-169.

Grant, R.M. 1991. The resource-based theory of competitive advantage: Implications for strategy formulation. *California Management Review.* v33:3 114-135.

Grant, R.M. 1995. *Contemporary Strategy Analysis, 2nd Edition.* Cambridge, MA: Blackwell Publishers.

Greenhalgh, L. 1995. Competition in a collaborative context: Toward a new paradigm. In R.J. Bies, R.J. Lewicki and B.H. Sheppard (Eds.), *Research on Negotiation in Organizations, Volume 5.* Greenwich, CT: JAI Press. 251-270.

Greenwood, R., C.R. Hinings and J. Brown. 1990. P2-form strategic management: Corporate practices in professional partnerships. *Academy of Management Journal.* v33:4 725-755.

Halal, W.E. 1994. From hierarchy to enterprise: Internal markets are the new foundation of management. *Academy of Management Executive.* v8:4 69-83.

Hall, R. 1992. The strategic analysis of intangible resources. *Strategic Management Journal.* v13:2 135-144.

Halverson, P.K., A.D. Kaluzny, and G.J. Young. 1995. Strategic alliances in health care: Opportunities for the Veteran's Affairs Medical System. *Working paper.*

Hamel, G. and C.K. Prahalad. 1993. Strategy as stretch and leverage. *Harvard Business Review.* v71:2 75-84.

Hamel, G. and C.K. Prahalad. 1994. *Competing for the Future.* Boston, MA: Harvard Business School Press.

Hannan, M.T. and J. Freeman. 1977. The population ecology of organizations. *American Journal of Sociology.* v82 (March) 929-964.

Harris, C., L.L. Hicks and B.J. Kelly. 1992. Physician-hospital networking: Avoiding a shotgun wedding. *Health Care Management Review.* v17:4 17-28.

Hellander, I., J. Moloo, D.U. Himmelstein, S. Woolhander, and S.M. Wolfe. 1995. The growing epidemic of uninsurance: New data on the health insurance coverage of Americans. *International Journal of Health Services.* v25:3 377-392.

Hinterhuber, H.H. and B.M. Levin. 1994. Strategic networks: The organization of the future. *Long Range Planning.* v27:3 43-53.

Hoskisson, R.E., C.W.L. Hill and H. Kim. 1993. The multidivisional structure: Organizational fossil or source of value? *Journal of Management.* v19:2 269-298.

Huff, A.S. and R.K. Reger. 1987. Review of strategic process research. *Journal of Management.* v13:2 211-236.

Hunt, M. 1972. *Competition in the Major Home Appliance Industry, 1960-1970.* Ph.D. Dissertation, Harvard University.

Kaluzny, A.D. and H.S. Zuckerman. 1992. Strategic alliances: Two perspectives for understanding their effects on health services. *Hospital and Health Services Administration.* v37:4 477-490.

Kanter, R.M. 1989. Becoming PALs: Pooling, allying and linking across companies. *Academy of Management Executive.* v3:3 183-193.

Kanter, R.M. 1994. Collaborative advantage: The art of alliances. *Harvard Business Review.* v72:4 96-108.

Kim, J-O. and C.W. Mueller. 1978. *Factor Analysis: Statistical Methods and Practical Issues.* Beverly Hills, CA: Sage Publications, Inc.

Lado, A.A., N.G. Boyd and P. Wright. 1992. A competency based model of sustainable competitive advantage: Toward a conceptual integration. *Journal of Management.* v18:1 77-91.

Longest, B.B., Jr. 1990. Interorganizational linkages in the health sector. *Health Care Management Review.* v15:1 17-28.

Lorange, P. and J. Roos. 1992. *Strategic Alliances.* Cambridge, MA: Blackwell Publishers.

Lorenzoni, G. and G. Baden-Fuller. 1995. Creating a strategic center to manage a web of partners. *California Management Review.* v37:3 146-63.

Lorr, M. 1983. *Cluster Analysis for Social Scientists.* San Francisco, CA: Jossey-Bass Publishers.

McGee, J. and H. Thomas. 1986. Strategic groups: Theory, research and taxonomy. *Strategic Management Journal.* v7 141-160.

Medical Group Management Association Annual Rept. 1996. Englewood, CO.

Meyer, A.D. 1982. Adapting to environmental jolts. *Administrative Science Quarterly.* v27:December 515-537.

Meyer, A.D., G.R. Brooks and J.B. Goes. 1990. Environmental jolts and industry revolutions: Organizational responses to discontinuous change. *Academy of Management Journal.* v11:Summer 93-110.

Miles, R.E. and C.C. Snow. 1992. Causes of failure in network organizations. *California Management Review.* v34:4 53-72.

Miles, R.E., C.C. Snow, A.D. Meyer and H.J. Coleman Jr. 1978. Organizational strategy, structure, and process. *Academy of Management Review.* v3 546-562.

Miller, C.C. and L.B. Cardinal. 1994. Strategic planning and firm performance: A synthesis of more than two decades of research. *Academy of Management Journal.* v37:6 1649-1665.

Miner, A.S., T.L. Amburgey and T.M. Stearns. 1990. Interorganizational linkages and population dynamics: Buffering and transformational shields. *Administrative Science Quarterly.* v35:4 689-713.

Mitchell, W. and K. Singh. 1996. Survival of businesses using collaborative relationships to commercialize complex goods. *Strategic Management Journal.* v17 169-195.

Montgomery, C.A., B. Wernerfelt and S. Balakrishnan. 1989. Strategy content and the research process: A critique and commentary. *Strategic Management Journal.* v12:1 83-84.

Nelson, R.R. 1991. Why do firms differ, and how does it matter? *Strategic Management Journal.* v12:Winter 61-74.

Newacheck, P.W., D.C. Hughes, and M. Cisternas. 1995. Children and health insurance: An overview of recent trends. *Health Affairs.* v14:1 (Spring) 244-254.

Nix, T.W., T.M. Rotarius, J.A. Buesseler, and S.B. Dymond. 1996. The effect of structural linkages and skill level competencies on competitive advantage: Synergistic resources in medical groups. Presented at the Southern Management Association annual meeting in November in New Orleans, LA.

Norman, G.R. and D.L. Streiner. 1986. *PDQ Statistics.* Philadelphia, PA: B.C. Decker, Inc.

Normann, R. and R. Ramirez. 1993. From value chain to value constellation: Designing interactive strategy. *Harvard Business Review.* v71:4 65-77.

Norusis, M.J. 1994. *SPSS 6.1.* Chicago, IL: SPSS, Inc.

O'Connor, S.J. and R.M. Shewchuk. 1995. Doing more with less, and doing it nicer: The role of service orientation in health care organizations. *Academy of Management Best Paper Proceedings.* 120-124.

O'Donovan, P. 1994. Making the transition to a new environment requires planning. *Health Care Strategic Management.* v12:8 15-17.

Oliver, C. 1990. Determinants of inter-organizational relationships: Integration and future directions. *Academy of Management Review.* v15:2 241-265.

Oliver, C. 1991. Strategic responses to institutional processes. *Academy of Management Review.* v16:1 145-179.

Paolino, A.R., J.M. Greaves, J.D. Blair, M.D. Fottler and T.M. Rotarius. 1995. Medical practice and physician executives face the uncertain future. *Medical Group Management Journal.* 42:5 (September/October) 36-43, 76-78.

Pedhazur, E.J. and L.P. Schmelkin. 1991. *Measurement, Design, and Analysis: An Integrated Approach.* Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.

Pekar, P., Jr. and R. Allio. 1994. Making alliances work: Guidelines for success. *Long Range Planning.* v27:4 54-65.

Peteraf, M.A. 1993. The cornerstones of competitive advantage: A resource-based view. *Strategic Management Journal.* v14: 179-192.

Pfeffer, J. and G. Salancik. 1978. *The External Control of Organizations: A Resource Dependence Perspective.* New York: Harper and Row.

Porter. M.E. 1985. *Competitive Advantage.* New York, NY: Free Press.

Powell, T.C. 1992. Organizational alignment as competitive advantage. *Strategic Management Journal.* v13:2 119-134.

Provan, K.G. and H.B. Milward. 1995. A preliminary theory of interorganizational network effectiveness: A comparative study of four mental health systems. *Administrative Science Quarterly.* v40:1 1-33.

Reed, R. and R.J. DeFillippi. 1990. Causal ambiguity, barriers to imitation, and sustainable competitive advantage. *Academy of Management Review.* v15:1 88-102.

Reger, R.K. and A.S. Huff. 1993. Strategic groups: A cognitive perspective. *Strategic Management Journal.* v14:2 103-124.

Reinertsen, J.L. 1995. Transformation: The new knowledge needed for health care administrators. *Journal of Health Administration Education.* v13:1 39-51.

Ring, P.S. and A.H. Van de Ven. 1992. Structuring cooperative relationships between organizations. *Strategic Management Journal.* v13:7 483-498.

Ring, P.S. and A.H. Van de Ven. 1994. Developmental processes of cooperative interorganizational relationships. *Academy of Management Review.* v19:1 90-118.

Rotarius, T.M., A.R. Paolino, B.M. McMurrough, M.D. Fottler and J.D. Blair. 1995. Integrated delivery systems/networks in the uncertain future. *Medical Group Management Journal.* v42:4 22-31.

Rowland, D., B. Lyons, A. Salganicoff, and P. Long. 1994. A Profile of the uninsured in America. *Health Affairs.* v13:2 (Spring II) 283-287.

Savage, G.T., J.D. Blair, M.J. Benson and B. Hale. 1992. Urban-rural hospital affiliations: Assessing control, fit, and stakeholder issues strategically. *Health Care Management Review.* v17:1 35-49.

Savage, G.T., R.L. Taylor, T.M. Rotarius, and J.A. Buesseler. 1997. Governance of integrated delivery systems/networks: A stakeholder approach. *Health Care Management Review.* v22:1 (Winter) 7-20.

Schoemaker, P.J.H. and R. Amit. 1994. Investment in strategic assets: Industry and firm-level perspectives. *Advances in Strategic Management.* v10A 3-33.

Schulze, W.S. 1994. The two schools of thought in resource-based theory: Definitions and implications for research. *Advances in Strategic Management.* v10A 127-151.

Scott, W.R. 1987. *Organizations: Rational, Natural, and Open Systems, 2nd Edition.* Englewood Cliffs, NJ: Prentice-Hall.

Seabright, M.A., D.A. Levinthal and M. Fichman. 1992. The role of individual attachments in the dissolution of interorganizational relationships. *Academy of Management Journal.* v35:1 122-160.

Sheppard, B.H. 1995. Negotiating in long term mutually interdependent relationships among relative equals. In R.J. Bies, R.J. Lewicki and B.H. Sheppard (Eds.), *Research on Negotiation in Organizations, Volume 5.* Greenwich, CT: JAI Press. 3-44.

Shortell, S.M. 1994. Organized delivery systems as a response to industry hyperturbulence. Presented at the Academy of Management annual meeting in Dallas, TX, August.

Shortell, S.M., R.R. Gillies and D.A. Anderson. 1994. The new world of managed care: Creating organized delivery systems. *Health Affairs.* v13:5 46-64.

Shortell, S.M., R.R. Gillies, D.A. Anderson, K.M. Erickson and J.B. Mitchell. 1996. *Remaking Health Care in America: Building Organized Delivery Systems.* San Francisco, CA: Jossey-Bass.

Shortell, S.M., R.R. Gillies, D.A. Anderson, J.B. Mitchell and K.L. Morgan. 1993. Creating organized delivery systems: The barriers and facilitators. *Hospital and Health Services Administration.* v38:4 447-466.

Shortell, S.M., R.R. Gillies and K.J. Devers. 1995. Reinventing the American hospital. *Milbank Quarterly.* v73:2 131-160.

Shortell, S.M. and U.E. Reinhardt (Eds.). 1992. *Improving Health Policy and Management.* Ann Arbor, MI: Health Administration Press.

Shortell, S.M. and E.J. Zajac. 1990. Perceptual and archival measures of Miles and Snow's strategic types: A comprehensive assessment of reliability and validity. *Academy of Management Journal.* v33:4 817-832.

Shouldice, R.G. 1991. *Introduction to Managed Care: Health Maintenance Organizations, Preferred Provider Organizations, and Competitive Medical Plans.* Arlington, VA: Information Resource Press.

Starbuck, W.H. 1993. Strategizing in the real world. *International Journal of Technology Management.* v8: 77-85.

State Health Watch: New study confirms slowdown in Medicaid growth, reduces pressure on Congress to pass reforms. 1996. *State Health Watch.* v3:12 (December) 3.

Stevenson, H.H. and M.C. Moldoveanu. 1995. The power of predictability. *Harvard Business Review.* v73:4 140-143.

Taylor, A.K., K.M. Beauregard and J.P. Vistnes. 1995. Who belongs to HMOs: A comparison of fee-for-service versus HMO enrollees. *Medical Care Research and Review.* v52:3 389-408.

Thompson, J.D. 1967. *Organizations in Action.* New York, NY: McGraw-Hill.

Wagner, J.A., III, and S.M. Crampton. 1993. Percept-percept inflation in micro organizational research: An investigation of prevalence and effect. *Academy of Management Best Paper Proceedings.* 22-36.

Weick, C. 1976. Educational organizations as loosely coupled systems. *Administrative Science Quarterly.* v21:March 1-19.

Weil, T.P. 1994. An American macromanaged health care system? *Health Services Management Research.* v7:1 43-55.

Weil, T.P. 1996. How health networks and HMOs could result in public utility regulation. *Hospital and Health Services Administration.* v41:2 (Summer) 266-280.

Wernerfelt, B. 1984. A resource-based view of the firm. *Strategic Management Journal.* v5 171-180.

Wholey, D.R. and L.R. Burns. 1993. Organizational transitions: Form changes by health maintenance organizations. *Research in the Sociology of Organizations.* v11 257-293.

Williamson, O.E. 1986. Transaction cost economics. In J.B. Barney and W.G. Ouchi (eds.), *Organizational Economics.* San Francisco, CA: Jossey-Bass. 98-129.

Williamson, O.E. 1991. Strategizing, economizing, and economic organization. *Strategic Management Journal.* v12:Summer 75-94.

Wolper, L. (Ed.). 1995. *Health Care Administration: Principles, Practices, Structure and Delivery, 2nd Edition.* Gaithersberg, MD: Aspen.

Zinn, J.S., W.E. Aaronson, and M.D. Rosko. 1994. Strategic groups, performance, and strategic response in the nursing home industry. *Health Services Research.* v29:2 (June) 187-205.

Zuckerman, A.M. 1993. Competitive strategies for faculty practice plans in the 1990s. *Medical Group Management Journal.* 40:6 (November/ December) 63-69.

Zuckerman, H.S. and T.A. D'Aunno. 1990. Hospital alliances: Cooperative strategy in a competitive environment. *Health Care Management Review.* v15:2 21-30.

Zuckerman, H.S., A.D. Kaluzny and T.C. Ricketts, III. 1995. Alliances in health care: What we know—what we think we know—what we should know. *Health Care Management Review.* v20:1 54-64.

APPENDIX A

STRATEGY AND HEALTH CARE JOURNALS

Strategy Journals

Academy of Management Executive
Academy of Management Journal
Academy of Management Review

Administrative Science Quarterly
Advances in Strategic Management
California Management Review

Harvard Business Review
Journal of Business Strategies
Journal of Business Strategy
Journal of Management
Journal of Management Inquiry

Journal of Management Studies
Long Range Planning
Management Science

Organization Science
Strategic Management Journal

Health Care Journals

Frontiers of Health Services Management
Health Affairs
Health Care Management Review

Health Services Management Research
Health Services Research
Hospital & Health Services Administration

Journal of Health Administration Education
Journal of Health Politics, Policy, and Law
Medical Care Research & Review

APPENDIX B

QUESTIONNAIRE ITEMS

Competitive Advantage

Currently, how does your organization rate in achieving the following goals compared to your local competitors?

	Much Worse		Same		Much Better
P4BQ1: Clinical Quality	MW	W	S	B	MB
P4BQ2: Service Orientation	MW	W	S	B	MB
P4BQ3: Market Share	MW	W	S	B	MB
P4BQ4: Profitability	MW	W	S	B	MB
P4BQ5: Cost Effectiveness	MW	W	S	B	MB
P4BQ6: Organizational Survival	MW	W	S	B	MB

Structural Linkages

Check all descriptions which you believe apply to your organization now.

Structural linkages with other medical groups:

P3Q10: My organization is part of an informal strategic alliance with a medical group ☐

P3Q11: My organization is part of a formal strategic alliance with a medical group ☐

P3Q12: My organization jointly owns facilities or other organizations with a medical group ☐

P3Q13: My organization has acquired medical practices or a medical group ☐

P3Q14: My organization has been acquired by a medical group ☐

Structural linkages with hospitals:

P3Q5: My organization is part of an informal strategic alliance with a hospital ☐

P3Q6: My organization is part of a formal strategic alliance with a hospital ☐

P3Q7: My organization jointly owns facilities or other organizations with a hospital ☐

P3Q8: My organization owns an acquired hospital ☐

P3Q9: My organization has been acquired by a hospital ☐

Structural linkages with managed care organizations:

P3Q2: My organization has discounted fee-for-service contracts with managed care organizations ☐

P3Q3: My organization has capitated contracts with managed care organizations ☐

P3Q4: My organization owns a managed care organization ☐

Structural linkages with integrated delivery networks and systems:

P3Q17: My organization is part of a loosely-integrated delivery network of medical practices, hospitals and managed care organizations ☐

P3Q18: My organization is part of a fully-integrated delivery system of medical practices, hospitals and managed care organizations ☐

Environmental Characteristics

Circle the numbers that best characterize the external environments of your organization now.

P9Q1: Stable Turbulent
1----2----3----4----5----6----7

P9Q2: Competitive Collaborative
1----2----3----4----5----6----7

P9Q5: Provider-driven Payor-driven
1----2----3----4----5----6----7

P9Q7: Capitation Fee-for-Service
1----2----3----4----5----6----7

Organizational Characteristics

P1Q11: Does your organization have a current, written strategic plan which has been updated within the last 12-18 months ?
☐ Yes ☐ No

P1Q13: Only medical practice executives and physicians should answer this question: If you are employed in a medical practice, indicate the number of Full-Time-Equivalent physicians employed in your practice: _____

P1Q14: Only medical practice executives and physicians should answer this question: Check the organization type that best fits your practice:
☐ Multispecialty
☐ Single Specialty

P1Q15: Only medical practice executives and physicians should answer this question: Is your organization considered a Medical School-Based Academic Practice? ☐ Yes ☐ No

Respondent Characteristics

P1Q1: What is your gender? ☐ Female ☐ Male

P1Q2: What is your age? _____years

P1Q3: What is your highest level of education?

☐ High School Diploma
☐ Associate's Degree
☐ Bachelor's Degree
☐ Master's Degree
☐ Doctoral Degree