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Nursing organizational structures in acute care hospital settings

Zwitter, Miriam Stokes, Ph.D.

Case Western Reserve University (Health Sciences), 1992

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NURSING ORGANIZATIONAL STRUCTURES IN
ACUTE CARE HOSPITAL SETTINGS

by
MIRIAM STOKES ZWITTER

Submitted in partial fulfillment of the requirements
for the Degree of Doctor of Philosophy

Dissertation Chairperson: Dr. Patricia Brennan

F. P. B. School of Nursing
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January 1992
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NURSING ORGANIZATIONAL STRUCTURES IN
ACUTE CARE HOSPITALS SETTINGS

Abstract

by

Miriam Stokes Zwitter

Contingency theory of organizational design (Lawrence and Lorsch, 1967) proposes that organizations are influenced by the environment in which they exist. The purpose of this study was to utilize the contingency theory as a theoretical framework in examining the structure, environment and quality of care variables. The research methodology implemented was developed by the Aston Group (Pugh et al., 1968, 1969). Concepts in organizational design were utilized to describe the nursing organizational structures currently implemented by nursing directors. Variables perceived by nursing directors about nursing organizational structures were identified. Nursing organizational environment and structures were examined. Lastly, the relationship between the RN/patient ratio and nursing organizational structure was examined.

The study offers support to certain dimensions of the Lawrence and Lorsch (1967) contingency theory. Some aspects of the organizational environment were found related to the structure of the nursing department. This study found that the environmental variable hospital size defined by number
of beds, had inverse relationships with centralization and specialization.

The nursing departments in rural hospitals were found to be significantly more specialized than their metropolitan counterparts. Other results did not support the contingency theory. The degree of formalization remained high for the nursing departments regardless of hospital environment. The type of hospital (profit/non-profit) was found to have no effect on the structural measures. It was also found that the RN/patient ratio had no relationship to the degree of centralization, specialization and formalization.

It was hypothesized that the inverse relationships between size and centralization and specialization were associated with the high percent of professional staff in nursing departments. Because of the professional identity of the personnel, less centralization may have been needed and limited division of labor occurred. Further research is needed to support or refute these notions. It was hypothesized that rural nursing departments had higher degrees of specialization most likely due to the fewer number and diversity of professional staff available to the rural hospitals. Further research needs to carried out to explore this notion.
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The time and effort made by the directors of nursing to participate in this study was appreciated. Many directors, working under heavy workloads, took the time to provide the necessary data. Their support was seen both in providing the data and in the added comments showing interest in this type of research.

Most of all, my husband, Norm Zwitter provided the support and encouragement to help me reach the end of this project. Norm, you are the best. Debbie and Janet, babysitters extraordinaire, you allowed me to work many worry free hours on this project. I also remember the many babies that came and went during these years and the baby that came to stay. Katie, you slowed this project down but you certainly have made my life more enjoyable. To all of you, thank you. MSZ

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CHAPTER 1

Statement of the Problem

The American health-care industry is currently in a state of flux triggered by revisions in federal health-care reimbursement methods (Coleman, Dayani & Simms, 1984; Curtin, 1984). Nursing departments in hospitals have implemented organizational structure changes in an effort to better cope with the effects of the reimbursement revisions (Curtin, 1984; Grimaldi, 1984).

Many of the structural changes have resulted in the addition and/or elimination of nursing positions, sometimes accompanied by a shift in reporting relationships within or outside of the department of nursing (Curtin, 1984). In observing these changes, questions arise about the impact of such decisions on the structure of a department of nursing and its effectiveness.

Structure is the sum total of the ways in which labor is divided into distinct tasks, and the parts coordinated to meet the organizational goals (Mintzberg, 1983). Lawrence and Lorsch (1967) propose that the optimal structure of an organization is dependent on a variety of variables. The variables influencing structural design in nursing need identification accompanied by a delineation of the relationships between these variables and the structures utilized in nursing practice.
Kanter (1990) identifies some of the problems originating from changes in structure, including employee confusion and misinformation leading to loss of money by the organization. Kanter also describes what she calls a "rent in the social fabric" (Kanter, 1990) meaning there is either a loss or realignment of power and status within the organization. "Emotional leakage," is another problem arising from restructuring and Kanter describes this as being due to the loss of key personnel. Associated with this is the loss of energy, initiative, and drive within the organization (Kanter, 1990). Lastly, Kanter (1990) identifies a weakened faith in the leadership resulting from restructuring.

If all of the above are the result of restructuring, it becomes imperative to restructure only when it is absolutely necessary. Otherwise, the organization may become crippled and ineffective. The restructuring must be done cautiously to bring about the best for that organization in the short as well as the long term.

The degree to which organizational structure can improve organizational effectiveness is not known. However, it is known that a poor choice of structure may produce many organizational problems (Drucker, 1975; Shortell and Kaluzny, 1983). One of these problems is poor human relations reflected in increased friction, confusion, and bickering. Increased costs by having too many layers of
people, too many meetings, and too many activities per person are also reflective of poor choice in structure. Other problems include decreased efficiency because of slow information processing, and slow decision making on incomplete data, and the loss of organizational goals (Drucker, 1975; Shortell and Kaluzny, 1983). Once the impact the structure of a nursing department can have is known, it becomes essential to know what variables influence design choice, what structures are being used by nursing departments in hospital settings, what environmental variables are related to the nursing structure, and the relationship between structure and quality of patient care.

The director of nursing is commonly responsible for the structuring of the department of nursing in order to meet the departmental and hospital goals. The decisions on how to structure will, in turn, affect practice, collegial relations, and efficiency of the department. In order to make design decisions, directors of nursing need to have a knowledge base to aid in decision-making which should, in turn, strengthen the nursing departments' effectiveness.

Purpose

The purpose of this study was to apply organizational theory in examining the structural, environmental, and quality of care variables functioning in nursing
departments. In addition, it attempts to provide nursing administrators that may be participating in making nursing organizational design decisions four specific answers achieved in data analysis. Concepts in organizational design were utilized to describe the nursing organizational structures currently (1988) implemented by hospital departments of nursing. Organizational variables perceived by nursing directors were identified, and nursing organizational environment (hospital size, location and type) and structures were examined. Lastly, the effect of the RN/patient ratio on structural measures was examined.

The variables utilized in this study have previously been identified in the literature. The environmental variables of size and type of ownership have been used in research by the Aston Group (1968, 1969) to describe organizational environment. Leatt and Schneck (1981) examined the relationships between nursing unit structure and hospital environment; this research utilized hospital size, type, and location as variables to describe the hospital environment in which nursing units exist. Routamaa (1985) utilized these same environmental variables to describe the organizational environment in his study of Finnish manufacturing firms. These specific organizational environment variables--i.e., size, type and location--were selected because they have been utilized to describe the
environment, particularly from a nursing perspective, in previous research.

Research Questions

The research questions were:

1. To what extent do directors of nursing in acute care hospitals perceive size, type, and location of the hospital; philosophy of nursing; purpose of the department of nursing; and method of patient assignment as influencing organizational design decisions?

2. To what extent are the organizational structures utilized by nursing departments in acute care hospital settings centralized, specialized and formalized?

3. What is the relationship between size (number of beds, numbers of personnel, budget) and the structural measures of centralization, specialization, and formalization for nursing departments in acute care hospitals?

4. Is there a difference in the structural measures of centralization, specialization and formalization in nursing departments in acute care hospitals in different locations (e.g., metropolitan, rural)?

5. Is there a difference in the structural measures of centralization, specialization and formalization in nursing departments in the two acute care hospital types of financial basis (e.g., profit, non-profit)?
6. Is there a difference in the structural measures of centralization, specialization, and formalization in nursing departments in acute care hospitals by quality of patient care as indicated by the RN/patient ratio?

Theoretical Framework

Lawrence and Lorsch (1967), in discussing their research conclusions, proposed what has come to be known as contingency organization theory. They concluded that in order for an organization to be most effective, organizational structures should be appropriate to the work performed and the environmental conditions facing the organization (Lawrence and Lorsch, 1967; Schoonhaven, 1981). In other words, the structure of an organization is dependent on its environment, according to the purpose for which it exists. Therefore, differences in environment produce differences in structure (Pennings, 1975).

Lawrence and Lorsch's (1967) contingency theory proposes that organizational effectiveness is a function of the "appropriateness" and "tightness of fit" between organizational environment and structure. Ford and Hegarty (1984) describe the Lawrence and Lorsch (1967) contingency theory, in a simplistic, mechanistic manner, as a stimulus-response model proposing environment as the stimulus and organizational structure as the response.
The Ford and Hegarty (1984) model does not explain the process but rather the inference of the Lawrence and Lorsch (1967) contingency theory. The purpose of the research of Lawrence and Lorsch (1967) was not to test contingency theory. Rather, contingency theory was developed as an explanation for the results of their examination of integrating and differentiating mechanisms within organizations. The definition of environment in the Lawrence and Lorsch (1967) research was along the element of uncertainty. There are, however, advantages, assumptions, and criticisms of contingency theory. One advantage is that contingency theory proposes a relationship between the organization and its environment, unlike bureaucratic classical theory (i.e., Weber), which did not examine the organization as part of a larger environment (Lawrence and Lorsch, 1967). Other theorists deal with the question of structure from a variety of less concrete perspectives. For example, Argyris (1957, 1965), Simon (1975), Galbraith (1977), Lindbloom (1959), Vroom (1974), Blake and Mouton (1978, 1981), Herzberg (1968), Burns and Stalker (1966), and Fiedler (1965, 1972) all represent a school of thought which examines the behavioral interactions between the people in
the organization and the organization itself. Such variables as decision-making, communication, values and beliefs, information processing, creativity, motivation, power, leadership style, and achievement represent some of those elements at work in organizations. However, it is beyond the scope of this study to incorporate these behavioral variables.

Another advantage to contingency theory is that it can be used to conceptualize the relationship between nursing departments and the hospitals in which they exist. Indeed, Lawrence and Lorsch (1967) developed the theory while examining subunits (i.e., marketing, research departments) of larger manufacturing organizations. This research reported follows their example by examining subunits, nursing department, within the larger organization, hospital.

The contingency theory is based on two assumptions. One assumption is that there is no one best way to structure (Schoonhaven, 1981). Instead, the "best" way for any organization to structure is dependent on a variety of variables. Much of the organizational research since the development of contingency theory (Lawrence and Lorsch, 1967) aimed at identifying organizational environment variables and understanding the relationships between the variables as they interact with structure.
The second assumption of the Lawrence and Lorsch (1967) contingency theory is that a particular way of structuring is not equally effective under all conditions (Schoonhaven, 1981). In other words, as environmental conditions change, the same method of structuring may not remain effective. Again, the environmental conditions influence the manner in which organizations are structured.

By definition, nursing departments in hospitals function as subunits of the larger organizations. However, nursing organizational structures in acute care hospitals have not been a major focus of nursing administration research. The influencing environmental variables have not been identified nor has the relationship between the structure and quality of care been examined. The present study attempts to examine these relationships by utilizing the contingency theory (Lawrence and Lorsch, 1967) as a theoretical framework.

Contingency theory, as it has evolved in research, provides a framework to study the interactions between the nursing department and its host hospital. It becomes possible to examine the relationship between the hospital organizational environment and the nursing organizational structure. This study derived the previously mentioned research questions about these relationships for testing.

Contingency theory provides a framework to examine a variety of organizations across a spectrum of settings.
For example, contingency theory can be used to research service industries such as nursing as well as manufacturing industries.

Critics of contingency theory cite the lack of definition of key terms (i.e., environment, technology, appropriate, fit, tightness) as a major problem (Schoonhaven, 1981; Ford and Slocum, 1977). Due to the lack of definition, researchers utilizing these concepts have failed to apply definitions and measures in a similar fashion. Thus, conclusions may be questionable (Ford and Slocum, 1977) and generalizations limited (Schoonhaven, 1981).

Another criticism of the organizational research are the methodological weaknesses in design (Schoonhaven, 1981; Mitchell, 1985). For example, validity and reliability of instruments are rarely addressed so that reported results are questionable (Mitchell, 1985). In addition, because sampling sizes and procedures are rarely reported (Mitchell, 1985). Finally, the conclusions are questionable as it is unknown what the sample represents. The conclusions cited in the literature are mostly based on case studies so that generalizations are limited. Though much research has been carried out based on the contingency theory, the soundness of the conclusions can be questioned.
Research Methodology

The Lawrence and Lorsch (1967) research did not provide the research methodology for examining the relationships between environmental aspects and structural measures in this study. Instead, the research methodology used in this study was developed in England by the Aston Group during the 1960's.

The Aston Group, lead by D.S. Pugh, consisted of researchers from a variety of fields (i.e., psychology, economics, sociology, and politics) who brought with them a variety of perspectives about the performance of organizational research (Pugh, 1985). The purpose of the Aston Group was to develop instruments and research methodology for use in organizational research examining organizational structure, as well as the relationship between organizational structure and environment.

The Aston group based their organizational research on three methodological elements. First, because organizations are complex and changing, it was determined that there is a need to study numbers of structural attributes together and as a matter of degrees rather than as either/or attributes (Pugh et al, 1968, 1969). In turn, they implemented multivariate statistics in organizational research. The current study implements this approach in studying three structural attributes--centralization,
specialization, and formalization—that are measured by degrees rather than their absence or presence.

Second, because organizations outlast the comings and going of individuals, Pugh et al (1968, 1969) found it was important to study organizations non-personal or institutional attributes (Pugh, 1968). To do this, the individual serves as the source of data about the organization rather than being asked how they experience the organization (Pugh, 1985). In the current study, the director of nursing served as the data source about the nursing department and environment.

Third, because organizations function as a whole, they and their members should be seen from more than one perspective for the most complete view (Pugh, 1985). One of their aims was to link organizational structure and functioning. This study examines the organizational structure and function relationship through examining the relationship between the three structural measures and the quality of care provided as indicated by the RN/patient ratio.

The Aston Group identified three organizational structure attributes or measures with which to analyze the structures. The identification of the structural attributes or measures resulted from the development of many instruments to describe different aspects of these attributes. Using factor analysis, three structural
attributes were identified. The first attribute was formal hierarchies or **centralization** of authority. The second attribute was division of labor or **specialization** of functions and roles. The third attribute was control systems or **formalization** of documentation and standardization of procedures. These three structural attributes or measures were used in the current research to analyze the nursing organizational structures and their relationship with the nursing organizational environment.

The Aston Group introduced the multivariate approach to organizational research. They selected many different organizational environment variables and statistically attempted to identify their relationship with the three structure measures. The variables they chose were purpose (i.e., production, education), ownership (i.e., public or private), size (i.e., number of employees, assets) and dependence on other organizations (Pugh et al, 1969). They later added strategic choice to the list of variables. Strategic choice entails decision making about the structure. Size and dependence were found to account for the differences in structural measures. Strategic choice was later found to relate with the three structural variables.

The contributions of the Aston Group were many. First, they provided an alternative means of studying organizations (Pugh et al, 1968). Instead of case studies,
a statistical approach was used so that many variables could be studied together. The current study utilizes this approach in analyzing the nursing organizational structures and environment. Second, the Aston Group provided a multidimensional means of examining organizational structures (Pugh et al, 1968). The current study utilizes these same three structural dimensions to describe nursing organizational structures. Third, they created instruments for examining organizations that continue to be used today (Pugh et al, 1968). The formalization instrument in the current study was developed by the Aston Group. Fourth, the Aston Group provided empirical evidence that supported the notion of relationships between the organizational structure and the specific environmental variables of size and ownership. The current study utilizes hospital size and type (ownership) in examining the relationship between nursing structures and environment.

There has been some criticism of the research done by the Aston Group. For example, they carried out their research without a theoretical framework and no hypothesis testing was done. Aldrich (1972) also cites the lack of operational definitions as a methodological problem. Rather than contributing to theory development by hypothesis testing, their contribution has been in the area of research methodology. The Aston Group research methodology has since been successfully utilized many times by members
of the Aston Group (i.e., Pugh, Hickson, Hinnings) as well as other researchers (Gringer and Yasai-Ardekani, 1981; Routamaa, 1985; Leatt and Schneck, 1981). The current study utilized the research methodology developed by the Aston Group to examine nursing organizational structures.

Assumptions

This study was based on three assumptions. The first assumption was that structures evolve from decisions. Second, self reporting is accurate. Third, it is possible to study the relationship between the total organization and one of its subunits versus studying the relationship between the total organization and its industry.

Delimitation

This study focused on the departments of nursing in acute care hospitals because this is the major arena in which nurses practice. Approximately 65% of all nurses work in acute care hospital settings (U.S. Bureau of Labor Statistics, 1988; Statistical Abstract of the United States, 1990). Military, government, for example Veteran's Administration (VA), and specialty hospitals were not included in the study because of external controls and/or narrow patient populations.
CHAPTER 2

This chapter addresses the review of literature that provides the background for this study. This review is based on organizational design, health care organization and nursing literature.

Organizational Design Literature

Organizational Structures

The introduction will review commonly discussed organizational structures in the organizational literature. These structures are functional, decentralized and matrix structures. The most frequently discussed structure in the organizational design literature is the functional structure. Many different terms presently in the organization design literature are used interchangeably when referring to the same structure, e.g., mechanistic (Galbraith, 1977) and bureaucratic ("machine-like" Weber, 1947 in Lincoln, 1985; Pugh, 1971). These terms reflect the perception of the organization (i.e., as a machine, as a collection of functions) by the individual authors.

A structure is classified as functional when division of labor is based on differentiation of jobs, there is limited delegation of authority and decision-making is centralized. In this situation there exists a high degree of differentiation, with many levels of supervision. In addition, the behavior of employees is controlled through
the use of rules and procedures (Galbraith, 1977) rather than through education, or professional standards (e.g., engineers, architects, actuaries, physicians).

The decentralized structure was proposed as an alternate structure to the functional structure. A decentralized structure is a flatter, broader structure in which authority and decision-making occur at lower levels in the organization (Drucker, 1974; Galbraith, 1977). Decentralized structures began to be described in the literature following a shift in practice away from the centralized decision-making towards decision-making in the lower ranks with a decrease in the number of supervisory levels. This structure was implemented successfully by A. P. Sloan Jr. at General Motors, and so became popularized (Chandler, 1962).

The third design possibility is the matrix structure. Matrix structures are a mix of vertical and horizontal relationships within the organization with dual reporting relationships (Galbraith, 1977; Drucker, 1974). There is delegation of authority, and it is usually accompanied by a high degree of specialization. The tiers of supervisory personnel are absent, as in the decentralized structure. Expert support, in the form of knowledge and/or skills, is provided for the line worker through the creation of staff positions. These positions are orthogonal to the formal chain of command, thereby forming a matrix. In other words,
matrix structure brings together the resources necessary for a complete product. These structures were first developed in the aerospace industries in response to the need to have experts from many areas working as a team on the same project (Mintzberg, 1983).

Matrix structures are written about more recently as a way for task forces, work groups, or project teams to operate within the organization. By using personnel across a variety of specialties to address a problem, product or issue, the work group provides a means of having all expertise needed at the work site (Assimakopoulos, 1989; Reitzfeld, 1989; Drucker, 1988). It may become more complex to manage in a matrix structure because of the dual reporting relationships. However, this structure does benefit the organization in terms of cost, personnel perceptions, and product (Assimakopoulos, 1989).

Another writer in organizational theory is Peter Drucker. He writes about hospitals as models for future organizations and describes organizations that consist primarily of professionals within organizations. Drucker (1988) means these to be organizations that will be information based, composed largely of specialists who direct and discipline their own performance through organized feedback from colleagues, customers, and headquarters. Drucker goes on to suggest that organizations will be smaller, using about half the number of levels of
managers. This, he believes, will mean that there will be no more than one third the **number** of managers present today.

One problem identified by Drucker (1988) is that in these new organizations, old structures will no longer work. Instead, it will become necessary to devise and manage a structure that will support an organization or collection of task forces.

As a writer in the field of organization and management, it is necessary to stop and consider what Drucker describes as future organizations. For nursing, many of his observations and proposals are relevant to the knowledge based specialist within a larger organization. This study provides a means for learning more about one kind of organization that consists primarily of professional or knowledge experts within a larger organizational setting.

However, although Drucker writes from the point of view of an experienced observer of organizations, his notions have no empirical basis. There also appears to be no theoretical basis for these notions and this lack of grounding in theory or research does bring into question the conclusions drawn by Drucker. On the other hand, Drucker is a respected writer in the field of management so that his comments cannot simply be dismissed.
Drucker points to hospitals as a model for how future organizations will operate. Research is needed about these "model" organizations, such as hospitals, described by Drucker. Research would provide information needed about how they are organized and managed. Research such as this, which describes the nursing department that comprises a large part of any hospital, is needed by both nursing and non-nursing organizations.

Structure and Personnel Variables

Research has been done that linked organizational structure to the people in service organizations. Some of the studies, which utilized the same structural measures as utilized in the current study, are reviewed. Also discussed is some of the research that examined the perceptions of decision makers on variables influencing decision making about organizational structures.

Fry and Slocum (1984)

Fry and Slocum (1984) examined the police force in a large midwestern city in an effort to learn about the relationships among structure, technology and workgroup effectiveness. They used 61 police workgroups in the city. Data collection was done using distributed questionnaires.

These researchers concluded that there was an interaction among these variables; however, the nature and
form of that relationship remained unclear (Fry and Slocum, 1984). One notion proposed by these researchers was that service organizations (i.e., police departments) may need to organize differently than manufacturing organizations. In other words, nursing departments may need to organize differently than industrial organizations. They also raise the issue of how difficult it was to measure organizational performance or work group effectiveness in a service industry.

Oldham and Hackman (1981)

Oldham and Hackman (1981) examined the relationship between organizational structure and employee reaction by evaluating 2,960 employees in 428 jobs in 36 heterogeneous organizations. These researchers used the job modification framework, which argues that structural properties of the organization influence employees reactions by shaping the characteristics of their jobs.

Oldham and Hackman (1981) utilized the same measures of centralization and formalization used by the current study to examine employees reactions to structural measures. Specifically, it was hypothesized that high degrees of formalization could severely limit the amount of individual freedom and discretion at work (Oldham and Hackman, 1981). In a nursing context, this could mean limited use of nursing judgement in the practice of
nursing. Instead, the nurse would have to go by the rules of policy and procedure rather than depending on expert knowledge, skill and nursing judgement. Oldham and Hackman (1981) also propose that high degrees of centralization often limit the contribution that employees can make to their work. In regard to nursing, this could mean limited involvement of nurses in nursing practice decisions and in self management. The studies supporting this proposal are not available.

Formalization and centralization were found to have a significant and negative relationship to employee descriptions of autonomy, identity, feedback and variety in jobs (Oldham and Hackman, 1981). In other words, formalization and centralization, as structural elements, influence an employee's ability to function independently and to gain an identity in the organizational context.

Although Oldham and Hackman's study (1981) was not performed in a nursing context, it does raise the question of the impact of the nursing organizational structures on nursing practice in an organizational or hospital setting. As can be seen, centralization and formalization are commonly studied organizational structure variables, therefore, justifying the use of these variables in the current study.
Ford and Hegarty (1984)

The Aston Group (Pugh et al, 1985) studied strategic choice in decision making about organizational structure. Ford and Hegarty (1984) built on this notion in an exploratory study that examined managers' beliefs about causes and effects of organizational structure. These researchers describe structure as the consequence of decision makers' choice as influenced by cognitive and motivational orientations or perceptions. These perceptions serve as a filter on decision making about structure and in turn may lead to inappropriate actions and/or attributes. The current research study examined those variables perceived by directors of nursing to influence restructuring decisions.

Ford and Hegarty (1984) used a technique called cognitive mapping to identify decision makers' beliefs about causes and effects in organizational structure. For this study, Ford and Hegarty (1984) used the following operational definitions. Technology was defined by task variability and interdependence. People were defined by the number and quality of personnel. Organizational structure was defined by complexity, formalization and centralization. Lastly, organizational performance was defined by quality of outcome.

The subjects consisted of Masters of Business Administration (MBA) students some of whom were considered
to be experienced managers. A survey was used to collect the data. Although results of the people-structure interaction showed that subjects perceived size as influencing delegation and quality of work, the signs were mixed. In other words, it was perceived as a positive and negative influence by the subjects in that increased size was believed to increase formalization (.95) and division of labor (.85), while increased professional qualifications were believed to decrease formalization (.58) and increase delegation (.82).

The structure and performance interaction perception results provided unclear results, whether cause or effect. The only clear result was that delegation was believed to have a positive effect on quality of work.

Ford and Hegarty (1984) conclude that these variables are indeed believed to be influential. However, it is unclear whether they are believed to be causes or effects. One variable believed to be very influential was size. Ford and Hegarty (1984) proposed that the nature of the influence of these variables will vary according to the decision maker, with the individual's perceptions and beliefs serving as a filter in the decision making process. Because of this, it is necessary for the current study to identify the variables that nursing directors perceive to influence their decisions regarding the organizational structure chosen for departments of nursing.
Organ and Greene (1981)

Organ and Greene (1981) studied one structural measure, formalization, and its effect on professional personnel. They defined formalization by the use of policies and procedures, job contracts, and formal work guidelines. In addition, they perceived conflict for the professional as the professionals' desire for autonomy versus the industry's need for and use of coordination, hierarchy and formal authority (Organ and Greene, 1981).

They used 247 engineers and scientists in three organizations in their study. The results indicated that the net effect of formalization was to decrease alienation, most probably by reducing role ambiguity and enhancing the identification with the organization. If this conclusion could be generalized to the nursing arena, it may be that although a high degree of formalization would be desired as a means of maintaining a low level of alienation, autonomy of the nurse in practice would decrease. The current study utilizes formalization as one structural measure in examining nursing departments in acute care hospitals.

Using path analysis, Organ and Greene (1981) found that formalization contributes to role conflict that contributes to alienation (effect 0.11). Role conflict that influences organizational identification leading to alienation had an effect of 0.04. The degree of effect,
however, is quite low. The reported estimate of effect (.15) of formalization in producing alienation because of inducing or arousing role conflict is reported as a combination of the two scores.

To decrease alienation, positive effects (-.12) were reported as formalization by decreasing role ambiguity and identification with the organization (-0.03). These last two results, according to Organ and Greene (1981), identify positive effects of formalization for the professional. In other words, by using policies and procedures, job descriptions and/or contracts, and formal work guidelines, the professional experiences less role ambiguity and identifies more clearly with the employing organization. Again, results must be cautiously interpreted as this study was not done in health care organizations and so cannot be generalized to nurses.

**Harrison et al.** (1988)

Harrison et al. (1988) looked at turnover and structural change in top management positions. They propose that turnover and structural changes in these positions depend on the firms' performance and the nature of the industry structure. One assumption by Harrison et al. (1988) is that different industries are organized differently and that the same industries organize in similarly. However, the research does not specifically
addressed this issue even though it may appear cognitively sound. If this assumption is true, then nursing departments should be more similar to each other than different in their structure. By looking at a large number of nursing departments, this study provides a means of examining this question.

In conclusion, organizational structure has been studied from many different perspectives. Organizational structure was seen to be defined most commonly by centralization and formalization, both of which are utilized in the current research. Research has been done that examines professionals in organizations and their relationship to structure. However, the effect of professional nurses in an organization has not been examined in any significant manner. The structure and personnel issues have been touched upon in the research and certainly point to the need for further research in this field. The current study attempts to look at these issues in the nursing arena and build the knowledge in these areas.

**Organizational Environment and Structure**

Early organizational research identified the environment-structure relationship. Chandler (1962), using a case study approach of several major corporations (i.e., DuPont, General Motors, Standard Oil of New Jersey, and
Sears), concluded that the organizational structures were a result of the external environment and the strategies developed to respond to that environment. The environment was defined by uncertainty.

Woodward (1965), predating the Aston Group and Lawrence and Lorsch, used a scale of technical complexity to categorize various kinds of organizations in England and concluded that organizational success depended on the appropriateness of an organizations' structure for the technology needed to complete its operations.

Organizational size and historical background were first used to analyze data from case studies without meaningful conclusions. However, when data was re-analyzed using production technology to differentiate between organizations, distinctions became apparent. The differences in technology were reported to account for the differences in structure.

Some of the research examining the environment-structure relationship has been based on the definition of environment by uncertainty (Ford and Slocum, 1977). Ford and Slocum (1977) attribute this narrowness of definition to the difficulty of accurately describing or defining the many environmental aspects. Lawrence and Lorsch (1967) utilized this definition of environment in their research that led to the development of contingency theory.
The Lawrence and Lorsch (1967) research is briefly reviewed here, along with one study based on the contingency theory. The Schoonhaven (1981) study utilizes hospitals to test hypothesis derived from Lawrence and Lorsch (1967) contingency theory.

There have been other researchers who have examined the environment-structure relationships based on the Aston Group research methodology. Some of these studies are reviewed. These studies identified the evolution of the definition of organizational environment beyond the element of uncertainty. Some of these additional aspects of organizational environment are size, type, and location. One group of researchers, Leatt and Schneck (1982), examined the relationships between nursing units and the hospital environment.

Lawrence and Lorsch (1967)

Lawrence and Lorsch (1967) identified the organizational structure-environment link using a case study approach comparing six plastics, two food, and two container industries. Their research examined the impact of external conditions (market and techno-economic variables) on integrative (quality of the state of collaboration existing between the functional units) and job differentiating mechanisms within the organizations. As is evident, the researchers examined subunits (e.g.,
sales, production, research) within the larger manufacturing organization. The environment was defined by uncertainty.

Effective organizations were found to exhibit a high degree of differentiation and integration (Lawrence and Lorsch, 1967). Thus, Lawrence and Lorsch (1967) concluded that the organizational environment (variables as yet not identified) influences, but does not cause, the structure implemented. However, there are limitations to this study, including the small sample and questionable variable operationalization and measurement (Tosi et al, 1973; Schoonhaven, 1981) as discussed earlier in Chapter One.

Schoonhaven (1981)

Much of the organizational research has entailed the study of non-service organization. The analysis of service organizations has been a more recent trend. In her study of hospitals, Schoonhaven (1981) examined three proposed relationships based on Lawrence and Lorsch (1967) contingency theory. These relationships were defined as follows: (1) centralization of decision making directly influences uncertainty to increase effectiveness, (2) low uncertainty and predictability produces high use of rules and programs with high degrees of effectiveness, and (3) high uncertainty and a high use of professionals (educated staff) produces increased effectiveness.
Using a sample of 17 hospitals, Schoonhaven (1981) addressed some of the issues raised with contingency theory. The sample was biased in favor of larger hospitals with the average number of beds in the study being 310. The acuity level of these hospitals was most likely higher than average because of the patients included in the study.

Schoonhaven evaluated the operating rooms and patient wards caring for at least 12 surgical patients at the hospitals used in the study. The patients were selected by surgical diagnosis, and were limited to those having organ surgery (e.g., brain), organ removal (e.g., appendix, heart) and organ replacement (e.g., heart) across degrees of severity, organs, procedures, outcomes, sex, age, and physical conditions (Schoonhaven, 1981).

Data were collected by interviews of the hospital administrator and operating room director, as well as by using questionnaires for the operating room nurses. The daily schedule of the operating room was used to illustrate workflow patterns. Patient-specific data following surgery, such as surgical effectiveness, death, and/or complications was also collected.

Schoonhaven (1981) defined technology, by uncertainty, as the variation in the workflow of the operating rooms. Structure was defined by decentralization, destandardization, and professionalization. Organizational
effectiveness was defined by morbidity and rate of complications at the post surgical unit level. Schoonhaven modified patient outcomes according to preoperative status and socioeconomic level and regression coefficients were used for analysis of results.

The results show of Schoonhaven's study showed negative relationships between all of the variables except morbidity and professionalization, uncertainty and decentralization. All the results were below $R^2=10.3$ in outcome except for two and these were uncertainty and morbidity ($R^2 = 24.2$ and $R^2 = 28.8$) (Schoonhaven, 1981). In summary, Schoonhaven concludes that effectiveness is enhanced by the interaction of the three variables—technology, structure and effectiveness. However, the nature of the interaction remains unknown.

These results need to be viewed skeptically. The results cannot be generalized beyond the sample of surgical patients, operating rooms and wards in the sample. It is unknown why this patient population was sampled versus other types of patients or units or organizations. It is also not known how many patients were in the final analysis.

The question must also be asked as to whether the measure of organizational effectiveness, death and/or number of complications, was a true measure of organizational effectiveness or a measure of the patients'
physical health. Schoonhaven did not report how number of complications was defined and measured nor at what point in time in the patients hospitalization complications were identified.

Perhaps a more accurate organizational measure of effectiveness would have been the quality of care provided by the caregivers to the various patients under a variety of conditions. Kovner (1972) proposed that the effectiveness measure for hospitals was the quality of health services provided to a given population. Heydebrand (1973) and Haussman et al (1976, 1977) both suggest, based on empirical findings, the use of the RN/patient ratio as an indirect measure of quality of care provided in hospital settings.

Quality of care could have been defined by the provision for the patients needs during the hospitalization. Instead of trying to directly measure quality of care, indirect measures of quality of care could have been used. One indirect measure of quality of care that could have been used was the ratio between professional nurses and patients. The current study utilized this measure of quality of care.

Professionalization was a variable used to define structure. However, no description is provided. Nor is any indication provided about the level of education or training of operating room employees at the time of the
study. In other words, the staff could have been all registered nurses, or largely technical. It is unknown how the physicians were factored into this equation. Many questions remain indicating further need for research or better reporting.

The hospitals used in Schoonhaven's study are not representative of hospitals across the United States in size and/or acuity. It is unknown if these were teaching hospitals, not for profit/for profit hospitals, and if they were in the same location. It is also unknown if the hospitals, units and patients were randomly selected or selected by other means.

Despite the methodological problems described above the Schoonhaven research (1981) does demonstrate the use of the Lawrence and Lorsch's (1967) contingency theory for research purposes in a service organization and does examine a small subunit within the larger hospital organization. Additional research is needed in continuing the definition and description of organizational environment beyond the original definition of uncertainty. Research must also expand to include service organizations as well as those organizations comprised of a high number of professional staff. This research also serves to indicate the difficult nature of research in organizations. Improved quality as well as quantity of research in this field is essential.
Anderson and Warkov (1961)

Other organizational researchers have pushed the definition of organizational environment beyond the original definition of uncertainty to include other environmental aspects. One such study was performed by Anderson and Warkov (1961), who used the environmental variable of size to find an inverse relationship between size, number of beds, and administrative intensity. Their research was done on hospitals and size was defined by number of beds. They found that in tubercular hospitals, 58% (.577) of the variance in the number of administrative employees was explained by differences in size. Similarly in the medical-surgical hospitals 56% of the variance was accounted for by the difference in size.

In trying to reconcile the differences in outcome from previous researchers who had found direct relationships between size and administrative intensity, Anderson and Warkov (1961) hypothesized that professionalization of staff may have contributed to the outcome. However, little research has been done since then addressing this question. The current study examines nursing practice organizations within acute care hospitals settings. Nursing departments are comprised of high proportions of professional staff and these professional staff levels versus the non-professional staff in
manufacturing organizations may account for differences in results.

**Aston Group** (1968, 1969)

The purpose of the Aston Group research (Pugh et al. 1968, 1969) was the development of standardized instruments and multivariate research methodology for use in analyzing organizations. The sample was a random sample of 52 organizations within a specific geographic area to which the researchers had access. The organizations were stratified by size and product, and included manufacturing (cars, chocolate bars), government (road repair, education), retail, and small insurance companies. Data collection consisted of interviews with senior administrative staff.

Pugh et al. (1969) found that the size of the organization, defined by numbers of employees and net assets utilized, best explained the character of the structure. Pugh et al.'s (1969) results showed a correlation of 0.69 between structuring of activities, represented by task specialization and standardization, and the size of the organization, concluding that the larger the organization the more hierarchical the structure. Pugh et al (1969) concluded that the size of the organization rather than technology as identified by Woodward (1965) defined the structure.
The environmental variable of ownership was tested for effect on the organizational structures. Pugh et al. (1968) examined the relationship between ownership, public versus private, and the three organizational measures. The relationships were found to be positive and weak (below r=.23). The conclusion was that ownership was not a significant influence on the organizational structure.

However, the Pugh et al.'s (1969) results have since come under question (Aldrich, 1972) due to research methodology problems (operational definitions, lack of theoretical framework) as previously discussed in Chapter One. In addition, the use of non-health care organizations makes the generalization of these results to nursing difficult. The Aston Group research (1968, 1969) did serve to support the notion of a relationship between organizational environment aspects and structure. They identified specific environmental aspects or variables which were found to be related to the structure. Two of these organizational variables, size and ownership, are utilized in the current study of nursing departments. The three structural measures utilized in this study were the same measures which the Aston Group identified in their research (1968). The current study utilizes the research methodology developed by the Aston Group.
Blau and Schoenherr (1971)

Blau and Schoenherr (1971) compared 53 employment security agencies in the United States in an effort to analyze organizational structure attributes and their interrelationships. Based on factor analysis of many organizational characteristics, Blau and Schoenherr (1971) identified three structural characteristics which they utilized in their research. These were centralization, specialization and formalization. Centralization was defined by the number of hierarchical levels.

Specialization was defined by two measures. One measure was the number of different jobs and the other measure was the distribution of personnel in the different jobs. Formalization was defined by the use of rules and regulations and standardization of procedures. Blau and Schoenherr (1971) also examined the relationship of size with the organizational characteristics. Size was defined by number of employees in the organizations.

There are similarities between the work of Blau and Schoenherr and the work of the Aston Group. Using the same mathematical methods, the same structural measures were identified and size again was an environmental variable of interest. The most significant difference between the two was in the sampling plan. Where the Aston Group included organizations from a variety of industries, Blau and
Schoenherr (1971) utilized organizations in the same industry.

All the agencies studied operated under the federal law and supervision but functioned as autonomous agencies. One specific interest to these researchers was ascertaining the influence exerted by the organizational environment—the specific larger organization of which subunits are a part—on the subunits internal structure. Blau and Schoenherr utilized a quantitative approach as does the current study. Based on a pilot study, a questionnaire was developed for data collection. Interviews were done with "key" administrative personnel and data analysis was performed using regression analysis.

Blau and Schoenherr (1971) found that size had a relationship with the structural measures. Size was defined by number of employees and size and centralization were found to have a strong positive relationship \( (r=0.73) \). Centralization was defined by the number of hierarchical levels. The centralization measure in the current study utilizes a standardized measure of centralization which incorporates the number of levels in the hierarchy plus the distribution of personnel in the levels.

In the Blau and Schoenherr (1971) study results, the scatterplots between size and number of hierarchical levels indicated that the slope of the regression line decreases at the outer end as size continues to increase. In other
words, there was a slowing down in the number of hierarchical levels after a specific point, while the number of employees continues to increase.

Blau and Schoenherr (1971) hypothesis was that for these organizations studied, there is a point in size at which the organization slows the adding of supervisory levels as size continues to increase. After a point, the degree of centralization increases at a slower rate.

Blau and Schoenherr (1971) defined specialization as the number of different job titles and the number of people in each job title. It must be noted that two measures were used to define specialization. Samuel and Mannheim (1979) developed a standardized measure of specialization combining these two measures. The Samuel and Mannheim (1979) standardized measure of specialization was used in the current study.

In the Blau and Schoenherr study there was a correlation of .78 between size and number of job titles. A correlation of .94 was found between size and number of people in job titles. As was evident a strong positive relationship was found between size and specialization. In other words, there was more and more division of labor into specific jobs as more people were added to the organizations.

However, the scatterplot between size and number of job titles shows that there is a decline in the number of
titles at the upper end of the regression line. After a point in size, the number of job titles slows down as size continues to increase. The same relationship was seen in the regression line between size and number of people in the job titles. In other words, after a specific point in size, there was a slowing down of the distribution of personnel into different jobs.

Based on these assumptions, Blau and Schoenherr (1971) hypothesized that when an organization reaches a specific point in size, there will be a slowing down in the division of labor. This could be considered a full complement of jobs for that organization. Therefore, rather than continuing to divide work into smaller and smaller units, the organization has more people doing the same work.

Formalization, or the use of rules and regulations and work standardization, was found to have a positive relationship with size. The correlation between formalization and size was .58. Blau and Schoenherr (1971) concluded that as the organizations grew in number of employees, more and more standardization of procedures was implemented.

Blau and Schoenherr (1971) concluded that size impacts the degree of centralization, specialization, and formalization. They noted, however, that the degree of
centralization and specialization slowed down after a point in size.

The same relationships between size and the structural measures of centralization and specialization were found in the local agencies. The degree of formalization was not examined at the local agencies. Size was found to have a correlation of .62 with specialization. Size and number of hierarchical levels, centralization, were found to have a correlation of .65. Blau and Schoenherr (1971) conclude that the local agencies follow the same pattern as the total organization in the relationships between size and structure. The effect of size was not only seen at the total organizational level but at the subunit level as well.

Blau and Schoenherr (1971) utilized a service industry in their research. However, they used a government service, regulated by federal laws which influenced the agencies' organizational operations. The current study utilized a service organization, nursing. Nursing does not operate under a legal umbrella such as the government. The Veteran's Administration Hospitals may operate in a comparable fashion. However, nursing does operate under a professional umbrella. There is a common professional identity for nurses across all employing agencies.
Gringer and Yasai-Ardekani (1980)

Gringer and Yasai-Ardekani (1980) attempted a replication of the Aston studies concluding that there is a positive relationship between strategic choice and structure. They used 502 electrical engineering companies of eight different kinds in England. Interviews of chief executive officers and/or senior management staff were done for data collection.

Size was defined by the number of employees and it ranged from 35 to 17,000 in the sample organizations. The same instruments used in the Aston studies were used in this study to define structure. The Aston Group results were supported. Size was found to be correlated with centralization, specialization, and formalization in moderate positive correlations.

A positive relationship was again found between formalization and decentralization. This positive relationship was interpreted to represent formalization as a means of maintaining control when decentralization exists. Gringer and Yasai-Ardekani (1980) go on to propose that different kinds of decisions are centralized and decentralized. Operational decisions were said to be decentralized and organizational wide decisions such as marketing and budget remained centralized.

These researchers pointed out the difference in organizations from the time of the original Pugh et al.
(1969) study in the late 1960's to the 1980's. The differences within the organizations were described as an increase in the quality of employees in areas such as level of education and number of professionals, and an increase in the complexity of organizations. The 1980's organizations were described as taller and wider, having higher numbers of administrative and production staff as well as using increased specialization and formalization with decentralized operational decision making as compared to the organizations studied in the 1960's (Gringer and Yasai-Ardekani, 1980).

This research was described as a replication. However, the researchers note the same organizations and environment were not used in the sample. Organizations and the environment in which they existed had changed over time. This study indicates the need for further research in this field and nursing as yet has no longitudinal studies to describe the evolution of the nursing organizational structure in practice organizations.

Leatt and Schneck (1982)

Leatt and Schneck (1982) report organizational research in which nursing units in Canadian hospitals were used to test the theorized relationships of size, environment, and structure. The theoretical basis of the research was Lawrence and Lorsch (1967) contingency theory
and the research design was based on the Aston Group methodology. The current study utilized the same theoretical basis (Lawrence and Lorsch, 1967) and methodology (Aston Group, 1968, 1969) as the Leatt and Schneck (1982) research. However, where Leatt and Schneck (1982) examined nursing units within hospitals, the current study examined the whole nursing department within the hospital environment.

There are evident problems concerning definition and measurement of variables such as the assumption that all nursing units are operationally equal, the RN/patient ratio being used as an indicator of professionalization, and nurses being decentralized from head nurses and physicians. However, their contribution is of value because of their attempt to examine the organizational environment and structure relationships in a nursing context.

The Leatt and Schneck (1982) results showed a correlation between size (number of beds on the unit) and specialization ($r = .53$), and a weak correlation between size and formalization ($r = .19$). There was a negative correlation of $r = -0.17$ between size and decentralization from the head nurse. The current study uses the same environmental variables (number of beds, location) and two of the same structural measures (specialization and formalization) as did Leatt and Schneck (1982). Leatt and
Schneck (1982) utilized a measure of decentralization and the current study utilized a measure of centralization.

For Leatt and Schneck (1982), the relationship between environment and structure was based on the definition of environment as being hospital size (number of beds), hospital teaching status, hospital location (urban, rural), and community size. The results showed a negative correlation between hospital size (number of beds in the hospital) and specialization (r=-.12), poor correlation between hospital size and formalization (r=.03), and a poor correlation between hospital size and decentralization from head nurse (r=.08). The correlation among hospital teaching status, location and community size to structure maintain this same pattern of results. Though the relationships appear evident in this study, the correlations show the relationships to be weak and nonsignificant. It must also be noted that the health care system in Canada is a socialized system. This factor alone may have influenced the outcomes. Conclusions and generalizations from this study are questionable because of research methodology problems.

The current study is similar to the Leatt and Schneck (1982) research in that both studies examined nursing practice organizations. However, the differences lie in the level of analysis. Leatt and Schneck (1982) examine the nursing units relationship with the hospital environment.
The current study examines the whole nursing department relationship with the hospital environment. In a sense the current study is an extension of the knowledge gained from the Leatt and Schneck (1982) research. The current study utilized a large sample of hospitals in the United States, which makes generalizations to the population possible, versus the small local sample in the Leatt and Schneck (1982) research, which is not generalizable.

**Routamaa (1985)**

Routamaa (1985), a more recent researcher, did a study of Finnish manufacturing organizations based on the Aston Group research methodology. He was attempting to identify further relationships between organizational environment and structure. The relationships between the organizational environment and structure of manufacturing organizations were analyzed. In this manner, aspects of the organizational environment continue to be identified through empirical research. The current study analyzes the relationships between nursing organizational structures and the hospital environment. The environmental variables included size, location and ownership. Size was defined by number of employees. Location was defined as either rural or metropolitan and ownership as either public or private. The structural measures used by Routamaa (1985) were
centralization, specialization, and formalization, the same structural measures utilized in the current study.

Routamaa found a positive correlation between total organizational size and formalization ($r = .62$) and between total organizational size and specialization ($r = .81$). However, between centralization and total organizational size, the correlation was positive and weak ($r = .15$). The strongest correlation found was between size and specialization and that relationship was positive in nature. Therefore, Routamaa concluded that the larger the organization, the more rules and procedures are used to control employee behavior. He also concluded that the larger the organization, the more differentiation of tasks is evident in order to achieve work goals. At the same time though, the larger the organization, the more apt it is to be decentralized. The findings support the Pugh et al. (1969) and the Blau and Schoenherr (1971) research discussed earlier, linking size and structure.

Routamaa (1985) extended the definition of environment by including location as another aspect of organizational environment. The current study utilizes location to describe organizational environment. Routamaa (1985) examined the location-structure relationship using the same structural measures of centralization, specialization and formalization as the current study. Results show a positive correlation between location and
formalization ($r = .39$), specialization ($r = .51$), and centralization ($r = .17$). In other words, location had a moderate to weak relationship with the organizational structure, most notably centralization and specialization. The rural and metropolitan organizations were found to be structured differently.

Routamaa examined the relationship between ownership and the structural measures. The Routamaa definition of ownership was private or public which was based on the Aston Group definition of ownership. This definition of ownership compares to the definition of type of hospital utilized in the current study. There was a weak relationship between ownership and formalization ($r = .39$), specialization ($r = .39$), and especially, centralization ($r = .03$). Ownership was found to be related to the structure; however, the relationships were weak.

The industrial nature of the organizations used in the Routamaa study makes generalizations of conclusions to nursing departments questionable because nursing departments consist of large proportions of highly educated professional staff whereas manufacturing industries primarily consist of non-professional personnel. The question must be raised as to whether cultural differences could have influenced the results since his research was carried out in Finland.
Summary

In summary, a relationship between size and organizational structure was found in the studies reviewed. Anderson and Warkov (1965) found an inverse relationship between size and administrative intensity in hospitals. The presence of professional staff in the hospitals was proposed as an explanation for the inverse relationship. Pugh et al (1969) found positive moderate relationships between size and centralization, specialization and formalization. Blau and Schoenherr (1971) found positive moderate relationships between size and centralization, specialization and formalization. Gringer and Yasai-Ardakani found positive moderate relationships between size and centralization and formalization. Leatt and Schneck (1982) using nursing units, found positive weak relationships between size (number of beds) and decentralization and formalization. However, they found an inverse nonsignificant relationship between size and specialization. Finally, Routamaa (1985) found strong positive relationships between size and formalization and specialization. However, he found a positive but very weak relationship between size and centralization.

Relationships were found between location and organizational structure by Routamaa (1985). The relationships were positive in nature ranging from weak between location and centralization to moderate, between
location and specialization and formalization. Leatt and Schneck (1982) found a negative relationship between location and specialization however, nonsignificant positive relationships were found between location and centralization and formalization.

Relationships were found between ownership and organizational structure by Routamaa (1985) who found weak positive relationships between ownership and specialization and formalization. A nonsignificant positive relationship was found between ownership and centralization. Pugh et al (1969) found ownership not to be significant influence on the three structural measures.

In examining the size variable, the question may be raise as to whether size is an organization variable or an environmental variable. In nursing, size or number of beds, defines the clients to whom nursing care is provided. Rather than existing external to the organization, as seen in other industries, clients are housed in one location, a hospital. In a sense, the bed becomes a temporary home for the clients receiving nursing services. Because of this arrangement, size as measured by number of beds comes to represent the number of clients serviced. In manufacturing terms, this could be considered products.

The results of the Aston Group (1968, 1969), Blau and Schoenherr (1971), Gringer and Yasai-Ardekani (1980), and Routamaa (1985) cannot be adequately applied to health
care organizations because of the differences in the nature of the organizations studied. Nursing organizations consist of a large proportion of highly educated professional staff. This aspect is not addressed in any of the studies described except as an alternate explanation to research results by Anderson and Warkov (1961). This study will provide a means of examining this aspect using nursing organizations.

It must be noted that in the reviewed literature, the validity and reliability of instruments is not consistently discussed by the authors. Pugh et al. (1968) developed their own measures and instruments as did Blau and Schoenherr (1971). The remaining researchers derived their measures and instruments from these researchers. In addition sampling procedures are not consistently reported so it is difficult to know what the samples represent. These research methodology issues serve to make the results questionable, much less generalizable beyond the sample. Quality as well as quantity of research is needed in this field.

Research links organizational environment to structure. The people-structure relationship appears to exist. However, the research conclusions are not generalizable and at times are insignificant. There appears to be a relationship between organizational size and structure. However, the conclusions are sometimes unclear
and often non-generalizable due to differences in definitions of concepts and research methodology.

As Ford and Slocum (1977) suggest, much research is needed with close attention paid to research methodology. Concepts such as size and environment continue to need refinement in definition and measurement. Sampling needs to be broadened to include a variety of service industries. The effect of high numbers of professional staff in the organization also needs to be addressed. Research methodology utilizing multivariate analysis rather than case studies would further enhance the research conclusions and generalization of findings.

Health Care Organizations Literature

There is a smaller body of literature that has developed as a subspecialty of organizational literature dealing with health care organizations. The development of health services research was triggered by the previously discussed Anderson and Warkov (1961) research using hospitals (Neuhauser and Andersen, 1972). Researchers concentrating on health services organizations have continued with the organizational research on a limited basis since that time.

The health care organizations literature serves to identify organizational variables studied in previous research. The variables that are most commonly used to
study hospitals in the health services literature have been hospital size, location, teaching status, ownership, complexity, administrative intensity, health care costs, and span of control (Neuhauser and Andersen, 1972). Hospital complexity (i.e. variety of services offered, types of patients) and size are strongly and positively correlated with span of control in the literature (approximately .70) (Neuhauser and Andersen, 1972; Dewdney and Thorne, 1969). Size and administrative intensity were found to be positively correlated ($r=.63$) (Neuhauser and Andersen, 1972) as were hospital size and formalization (Neuhauser, 1966; Saathoff and Kurtz, 1962; Fearon, 1969). Starkweather (1970), however, found no relationship between formalization and size but instead between formalization and hospital complexity (variety of services).

The health services literature is an extension of the organizational research dealing with the question of structure and the environmental variables that influence structure, as well as the influence structure has on process and outcomes. The size of the hospital is recognized as an influence on structure. Type of hospital is also thought to influence structure; however, empirical studies to confirm this hypothesis have not yet been performed. Structure is thought to influence the organizational process and outcome (Neuhauser and Andersen,

The definition of size by number of beds, is consistent in the health services research. The structure of hospitals is most commonly described in the literature as bureaucratic (Hall, 1982; Mintzberg, 1983; Galbraith, 1977; Shortell and Kaluzny, 1983; Haiman, 1973). In other words, hospitals are perceived to use centralized decision-making, depending on a high degree of specialization and formalization to achieve their goals. At this time, no studies have been reported that incorporate the measures of centralization, specialization, and formalization as defined in the current study to describe hospitals' organizational structure. Other researchers have used number and types of employees to further describe structure (Neuhauser and Andersen, 1972). The location of the hospital (metropolitan, non-metropolitan), referring to the community being served, is commonly used to describe the hospital organizational environment. Another common definition of environment is ownership, whether the hospital is for-profit or not-for-profit. This study incorporates these measures in the definition of organizational environment. Hospital teaching status is most commonly used to define hospital complexity and so, was collected as descriptive data.
More recent literature discusses the health care corporation rather than the hospital itself. This change has occurred because many hospitals are now simply one piece of the whole health care corporation. Thus, instead of reporting research about the organizational structure, most of the health care organization literature entails authors sharing their experiences or proposing alternate means of structuring health care corporations.

Some authors examine the issues of restructuring (Burda, 1986; Gallwan, 1986) in terms of health care organizations changing to survive the economic environment of the health care industry. Other authors primarily present diversification (Snook, 1987; Simon and Cohen, 1989; Liszewski, 1988; Giardina et al, 1990; Sabatino, 1989,1990; Ives, 1989) as the best means of the organization continuing to exist. Diversification to these authors includes the restructuring of health care organizations into profit and non-profit components and the development of foundations and parent holding corporations.

Joint venture as a means of decreasing risk and increasing return for hospitals is proposed by Pelfrey and Theisen (1989) and Rosenfield (1985). Vertical integration is presented as a better alternative than diversification by Fox (1989) because, as described by Fox, it allows the health care organization to withstand the ill effects of
today's business environment. He recommends broader coverage (ambulance services, medical offices, rehabilitation services) and the linking of institutions for "centers of excellence," as well as the redesigning of operations to decrease cost.

Some authors describe their experiences downsizing departments within hospitals. Mullaney (1989) reports her experience with downsizing a hospital and health care services. She describes the process as a planned response to the decrease in service utilization. Structural changes such as elimination of services and/or numbers of personnel were implemented as part of the downsizing. Shaffer (1989) reports his experience of downsizing clinical engineering and Mahoney (1990) in pharmacy services, both in hospital settings. Though the above authors address different hospital departments, they all predict that more downsizing of hospital services yet occur. These authors share the description of their experience as an organizations' response to the environment in which it operated.

Clearly, the underlying theme or concern in these more recent writings appears to be the survival of the health care organization in difficult economic times. The structure of the organization is discussed from a perspective of restructuring in response to this time of economic crisis in health care. The quality and quantity
of the information varies with the author. In addition, very little research is reported and conclusions and recommendations must be viewed skeptically. Research is needed on the variety of organizational changes proposed as well as longitudinal studies to look at the long term effect of these changes.

Nursing Literature

Introduction

As a profession, nursing has not defined how its' practice organizations need to be structured. Munson and Clinton (1979) have described how nursing has organized at the unit level over time from a functional assignment pattern to a primary nursing pattern. The advantages and disadvantages of each pattern is described. There is no comparable work for the department of nursing as a whole nor for examination of the relationship between the unit structure and the departmental structure.

Strassen (1988) defines the traditional nursing department in acute care hospitals as having been or being bureaucratic in nature. "Bureaucratic" was not defined nor did she report how this conclusion was reached. Strassen goes on to describe the nursing organizational structure as having three to five levels of nursing management personnel. This organization is described as being slow to
change, unresponsive to its' customers (nurses, patient, physicians, hospital administrators), and costly to operate because of the layers of personnel. However, it is unknown how these descriptions were arrived at, whether through experience, observation or research. These conclusions appear based on untested assumptions.

Nursing Organizational Structure Characteristics

Specific aspects of nursing departments' structure have been addressed in the literature by different authors. For example, the most common element discussed in the literature today appears to be centralization versus decentralization. Decentralization is deemed desirable because it lies more closely in line with the philosophical belief of the professional being in control of their practice (Clifford, 1982; Christman, 1976, 1986; Althaus et al, 1981; Scherer, 1988; Kerfoot, 1989; Bryant, 1988). In decentralized nursing departments, the decisions are to be made at the lowest level possible—preferably, by the practitioners themselves. In this fashion, the nurse giving care has responsibility and authority not only for decision making (Althaus et al, 1981) but for implementation as well.

Singleton and Cameron (1988) write a dissenting voice regarding the decentralization of nursing services. They identify several problems, including loss of vision of the
whole department, competitiveness among divisions and/or units, slow decision making, and questionable quality of communication with an increase in the number of people participating in the decision making. Other problems identified are underutilization of specialists, duplication of services with increased cost, and non-uniformity of policies and procedures from unit to unit. They also raise the question of whether there is management competence from those who are promoted based on clinical competence. Again, these authors voice concerns but do not identify how these issues were recognized.

Concern was expressed by Singleton and Cameron (1988) that the nursing department head would move up into the corporate realm and so lose the nursing perspective needed to guide and speak for the nursing department. They go on to warn that potentially, this position could be filled by a non-nursing person. If this were to occur, who would represent nursing and speak for it in a unified voice (Singleton and Cameron, 1988)?

The element of specialization, or the segmentation of work into distinct jobs, is rarely discussed in the nursing literature. Nursing theory proposes that the whole patient is the focus of nursing care (Meleis, 1985; Levine, 1969, 1973; Rogers, 1970; Roy, 1984). The expert nurse is therefore considered to be one who can give total care to the patient, a highly skilled and knowledgeable
practitioner who is needed at the bedside (Beecroft, 1988). In writing about the organizations of the future, Drucker (1988) describes this as the knowledge expert. However, this philosophy is not reflected in the splintering of patient care into specialized jobs.

For example, the creation of nurse chemotherapists, discharge planners, patient educators and IV teams reflects the segmentation of patient care into specialized jobs. The creation of these positions is not discussed from the specialization perspective, but from a perspective of bringing expertise to the staff nurse at the bedside, and/or from the perspective of quality control for specific tasks (Farkas, 1982).

More recent writing shows a trend to use case management in patient care assignment. Case management reflects the total decentralization of patient care with the nurse having 24 hour responsibility for specific patient's care (Kerfoot, 1988; Olivan et al, 1989). In a sense case management is an evolution of primary nursing.

The development of primary nursing has decreased the functional specialization of nursing seen in the past years (Munson and Clinton, 1979). However, the more recent past has seen the development of specialized jobs in staff positions. In turn, this has introduced matrix structures in nursing.
Yano-Fong (1988) and Flynn (1991) propose the use of matrix structures with the implementation of product line management in hospitals (described in more detail below). Nursing (e.g., surgical nursing, ophthalmology nursing, orthopedic nursing) would be the functional manager with the product line manager (e.g., heart transplant, cataract surgery, hip replacement) in the orthogonal staff positions (Yano-Fong, 1988; Flynn, 1991). However, evaluation of the utility of this structure is scant and based on very limited short term implementation.

Formalization is not discussed in the nursing literature except as necessary personnel management strategies to meet organizational goals (Fine in Marriner, 1982; Gillies, 1982; Stevens, 1980). Formalization, or the use of rules and regulations to control employee behavior, is seen in the use of policies, procedures, and job descriptions to direct and control nursing practice. Policies and procedures are usually decided by a committee of nurses representing nursing management or by specific nursing administration personnel (Stevens, 1980). The question can then be raised as to whether the nurse providing patient care is in control of practice or is practice defined externally by management.

Bryant (1988) recommended nursing practice by professional standards rather than by rules and regulations. This alternative to using departmental
formalization to control nursing practice would also increase the professionalization of staff members in the provision of patient care. This would be closely aligned with what Drucker (1988) described as future organizations and can be seen in the development of case management. Professional standards of care are developed for the profession with the practitioner in control of practice. Quality control then becomes an issue of recruiting practitioners who maintain professional standards.

Nursing Organizational Design Literature

Much of the nursing literature addressing the organizational design of practice organizations consists of reports of personal experiences or descriptive reports of observed organizations. Some of these reports reflect the manner in which nursing departments are structured and the decision making involved in the structuring; these reports are reviewed in this paper. In addition, some reports of innovative structures are also reviewed because they serve to illustrate recent trends in the structuring of nursing departments.

Descriptive Studies

The nursing literature in the area of organization design reflects the experiences of a select group of writers describing the manner in which they have organized
a department of nursing or their observations of how a
department of nursing has been organized (Sovie, 1981;
Schaefer, 1975, 1976; Christman, 1976; Kenwood and Van
Cura, 1979; Brown, 1979; Marriner, 1980; Clifford, 1983;
Scherer, 1988; Kellenhouser, 1987; Friss, 1987; Bryant,
1988). These writings could be considered brief summaries
of case studies, but the depth of analysis of the
organization varies with the author.

Variables that appear to influence choice of design
can be gleaned from the writings of this group of nursing
authors. One of these variables is the purpose of the
department of nursing, such as quality patient care,
education, research, or combinations thereof (Sovie, 1981;
Schaefer, 1975, 1976; Christman, 1976, 1989; Pannell, 1982;
Clifford, 1983; Bryant, 1988; Cilliers, 1989; Friss, 1987).
Another variable that appears to influence choice of design
is the philosophy of nursing (Christman, 1976, 1989; Sovie,
1981; Clifford, 1983; Hoesing and Kirk, 1990; McClure,
1989). The third variable that appeared to influence
organizational design decisions that could be gleaned from
the literature review was the method by which patient care
is assigned, specifically primary nursing (Sovie, 1981;
Christman, 1976, 1989; Pannell, 1982; Brown, 1976;
Marriner, 1983; Clifford, 1983) and case management
(Kerfoot, 1988; Olivan et al, 1989).
Brown (1976), Christman (1975, 1976), Sovie (1981), Pannell (1982), Schaefer (1975, 1976), and Marriner (1983) wrote from the perspective of large acute care nursing service settings and/or nursing education settings. None of these authors address small nursing departments nor nursing departments in a variety of hospital settings. The variables which influence design in the cited nursing studies appear to correspond to the variables identified in the organization design literature as previously summarized.

Other nursing authors (Bernhard and Walsh, 1981; Beyers and Phillips, 1979; Gillies, 1982; Marriner, 1980, 1982; Stevens, 1976, 1980) writing about organizational structures in nursing simply report the organizational design literature. These reports rarely include the original research involved and there are no nursing studies cited to support or refute the organizational literature in a nursing context or health care context. For the above authors, the underlying assumption appears to be that nursing in hospital settings is organized primarily in one manner, which is functional, and that all hospital settings are equal.

Joyce Clifford, writing of her experience at Beth Israel in Boston (Clifford, 1983), is one exception to the above assumption. In her report, the organization of the nursing department is described in a framework of nursing
practice. The structure implemented is decentralized to support the decentralization of decision making, authority, and accountability to the practitioner delivering nursing care based on stated beliefs about nursing professional practice (Clifford, 1983). According to Clifford (1983) primary nursing is implemented as the delivery of care method, which in turn according to Clifford (1983), requires a decentralized structure in which to function effectively. However, this decentralized nursing department organizational structure is not defined nor differentiated from past nursing organizational structures. Again, Clifford wrote from the perspective of the nursing administrator in a large urban hospital. She did not address whether these beliefs apply to nursing departments in other settings.

Another exception is Kellenhouser (1987), who described a nursing department that is structured without a department head and without divisional (functional) department heads (e.g., pediatrics, medical, surgical nursing). Instead, divisional supervisors manage the department as a team through what is called a Nursing Council. The Nursing Council reports directly to the hospital chief executive officer and is responsible for department wide decisions such as salaries and services provided. Head Nurses are responsible and accountable for all unit management decisions such as hiring, firing,
schedules and job descriptions. The Council meets on regular occasions and each Council member meets on a regular basis with the head nurses that report to that person.

Kellenhouser (1987) described the positive outcomes of this organizational structure as increased morale, increased retention, improved communication and increased participation in decision making. The downside is reported as a slowing down in decision making because of the numbers of people involved in the process. However, Kellenhouser does not describe the size of the hospital or the nursing department in any fashion. The type and location of the hospital is not provided. The length of time this structure has been in place is also not provided, nor are the reasons for this restructuring. Scherer (1988) described four innovative nursing departments. One of the nursing departments is Beth Israel in Boston, which has been described above. Another is Beth Israel in Newark. At this hospital, Orems' model of self care was implemented as the framework for the nursing department in which nurses function in a capacity that supports self care by patients. The nursing department as a whole was not described in terms of the changes implemented to effect this change.

Scherer (1988) also described the nursing department at Santa Monica Hospital which implemented a plan to re-educate the staff to perceive the nursing units as
franchises. Each nursing unit operates as a separate franchise. The unit staff "own and manage" the unit with total responsibility for the functioning of that unit. This change impacted at the unit level. The nursing department as a whole must have been effected by this change, however, if restructuring was implemented in the organization of the department, these structural changes are not described.

The fourth hospital described by Scherer (1988) was the Lutheran Hospital Society Corporation in California. In this nursing department, all support services were placed under the department of nursing. These services included dietary, housekeeping, central supply, admissions, physical therapy and respiratory therapy. In this manner, all services that provided patient care and/or services are under the management of one person, the nursing department head who was retitled as patient services administrator. With this restructuring, middle managers were eliminated. Patient services were integrated at the unit level. Head nurses became nursing chiefs. The outcome for the restructuring is reported as an increase in job satisfaction by staff and an increase in quality of care. It is unknown how these results were measured. No concerns or problems with this organizational restructuring were reported.

Unfortunately, Scherer (1988) however, does not provide background information on the size, location
or type of hospitals for the above reports. The quality and quantity of information on each of the departments is inconsistent and a case study of each nursing department would have been beneficial. However, the article does serve to show that some alternate means of structuring do exist in nursing departments.

Beecroft (1988) wrote a proposal for the organizational design of nursing departments from the perspective of staff satisfaction in the organization and the retention of qualified staff. She proposed that hospitals need to provide an environment in which professional nurses achieve professional status, have authority over practice, and are accountable to themselves and the patient for the services provided. Beecroft proposed the achievement of this situation through the development of the Nursing Staff Organization (NSO), which would function parallel to the Medical Staff Organization. The Nursing Staff Organization would report to the Board, make recommendations to hospital administration and operate on a shared governance model. The NSO would determine nursing practice policy, make decisions regarding nursing policy, nurture professional practice, and operate by participation by its' members in decision making.

The other change recommended by Beecroft (1988) is a change in the mode of reimbursement for nursing services. This could be done using a contractual basis for payment.
Rather than being hospital employees per se, the hospital would contract out nursing services through the NSO. In a sense, this is not much different than what is now arranged through staff extender services at the unit level. If this reimbursement method were implemented, restructuring of the department would be imperative as subordinate-superior relationships may no longer exist. However, this model has not been implemented at this time and lacks empirical support.

Daman, Noble, and Russell (1984), Kenwood and Van Cura (1979), Kimbro and Kimbro (1980), Marriner (1983), Pannell (1982), Valentine and Valentine (1983) and Olivas et al (1989) presented alternate non-functional structures for nursing to implement such as case method and variations of primary nursing. However, they focused primarily on the unit level, examining and proposing various methods of providing care, instead of focusing on the department of nursing organization as a whole. In addition, these authors do not address the relationship of nursing unit structure to the nursing department structure.

Yano-Fong (1988) is one nursing author who has advocated the implementation of product line management. This model would effect the unit level as well as the departmental level. There appears to be much written about product line management (Yano-Fong, 1988; O'Malley et al, 1991; Flynn, 1991) with the implementation of a matrix
structure. However, implementation reports are scarce and short term. Time and further reports will serve to evaluate their usefulness in health care.

Empirical Studies

There have been some empirical studies that examined the structure of nursing departments. However, much of the research has been tied to the quality of care issue. Some of these studies are reviewed.

Haussman, Hegyvary, and Newman, (1976, 1977), in their research evaluating quality of care, examined the effect of structural variables on the outcome of patient care. Hospital size, defined by number of beds, was found to have a negative correlation to the components of care (r = - .12 to -.29) (Haussman et al, 1976). This negative relationship was maintained between the unit size and quality of care relationship. The sign of the beta weights for the regression tests were not always consistent with the sign of the r score. The type of hospital (teaching, medical center referring to complexity) appears to have a negative relationship on the quality of nursing care (r = -.16 to -.41) (Haussman et al, 1976) which was contrary to the hypothesis proposed by Neuhauser and Andersen (1972) for quality of medical care.

The picture presented by the Haussman et al (1976) results is indeed a mixed picture. The relationship between
size and quality of care, and type of hospital and quality of care is not clear or negative. The structure of the nursing department as a whole, was not addressed by Haussman et al (1976, 1977). The relationship of the size and context variables to the structure of the nursing department was not investigated. The relationship of the department of nursings' structure and quality of care was also not examined and it is questionable whether these results can be generalized to smaller/larger and/or rural nursing departments.

From a patient satisfaction perspective, Abdellah and Levine (1958) showed that patient satisfaction with nursing care increases with an increase in the number of hours of professional nursing care per day provided per patient. New, Nite, and Callahan (1960) supported this conclusion by showing that patients opinions of nursing care increase as the number of hours a professional nurse is available per day increases. Along with this, the opinion of nursing units (favorable) increased with an increase in RN ratio to total staff. In turn, this supports the concept of primary nursing utilizing RN staff as the means for patient assignment.

Haussman et al. (1976) empirically show that RN hours per patient day, the use of primary nursing as the unit assignment pattern, and the coordination of patient care relate positively to the quality of patient care. Since the
number of RN hours per day, primary nursing, and the coordination of patient care are dependent on the number of RN staff, the best predictor of quality of patient care by the nursing department can be said to be the ratio of RN staff to patients. Therefore, this ratio is used in the current study to indicate quality of patient care provided by nursing departments.

Summary

Nursing is the largest labor expense of the acute care facility (Strassen, 1988) accounting for 20-40% of the total operating budget for hospitals with 300-500 beds. From a nursing administration research perspective, nursing authors (Christman, 1986; Henry, 1987) do identify nursing department structures as a priority research topic, in particular, the relationship of the nursing department structure to quality of care issues such as increased patient satisfaction, decreased number of complications, and shorter hospital stays. The question of the relationship between nursing department structures and productivity is raised (Henry, 1988), specifically identifying the need to look at nursing department structures along with the cost of nursing care services. Strassen (1988) reminded us that nursing needs to develop methods of caring for sicker patients within the limited
resources of hospitals. Nursing administrative research such as this, is a move in this direction.

It was evident from the review of nursing literature that the nursing practice organizational structure has not been defined nor described as a multi-dimensional concept. Instead, nursing authors discuss it primarily by one dimension, either centralization or specialization. This research examined nursing organizational structures from a multi/dimensional perspective using the structural dimensions identified in the Lawrence and Lorsch (1967) contingency research.

The nursing literature does not report any organizational research that utilized a large, national sample like that used in the current study. Neither does the nursing organizational literature report any research that utilized a sample stratified by the research variables hospital number of beds (size), location and type. The current study implemented a research design that included a large (n=98) national stratified sample of nursing departments in acute care hospitals to better describe the population.

In addition, there was scant nursing research that examined the interaction between the nursing practice organizational structure and the environment. The interaction between the nursing department structure as a subunit and the whole organization (hospital) as the
environment has not been previously examined. The current study investigated the relationships between these variables.

It was evident from the literature reviewed that organizational structures continue to be a focus of organizational design research. Size and context appear to influence structure, however, the strength and direction of the relationships remain unclear. Nursing organizations design research is limited in both number and scope of studies. Most of the nursing literature uses a case study approach rather than multivariate research examining the organization variables across a large sample of nursing departments. This study contributes to the organization design knowledge by addressing questions that have not previously been addressed. In turn, this study's results will provide a basis for continued research in nursing organization design.
CHAPTER 3

Chapter Three contains the research design, definition of terms, instruments, sampling plan and methods used to answer the research questions. As previously stated, the research questions were:

1. To what extent do acute care hospital directors of nursing perceive size, type, and location of hospital; philosophy of nursing; purpose of the department of nursing; and method of assigning patient care as influencing the design decisions for the nursing department structure?

2. To what extent are the nursing organizational structures utilized by nursing departments in acute care hospital settings centralized, specialized, and formalized?

3. What is the relationship between size (i.e., number of beds, numbers of personnel, budget) and the structural measures of centralization, specialization, and formalization for nursing departments in acute care hospitals?

4. Is there a difference in the structural measures of centralization, specialization and formalization in the nursing departments in acute care hospitals in different locations (i.e., metropolitan, rural)?

5. Is there a difference in the structural measures of centralization, specialization and formalization in
nursing departments in the two types of financial basis of acute care hospitals (i.e., profit, non-profit)?

6. Is there a difference in the structural measures of centralization, specialization and formalization in nursing departments in acute care hospitals by quality of care as indicated by the RN/patient ratio?

Research Design

This is an exploratory descriptive study of nursing organizational structures utilizing the contingency theory of Lawrence and Lorsch (1967) to examine the nursing organizational structure. The research methodology is based on the Aston Group (Pugh et al., 1969) multivariate approach to organizational research. The subjects are departments of nursing in acute care hospital settings in the continental United States. Directors of nursing or his/her designee are the source of data for the study.

As a result of the research, the organizational structures utilized by nursing departments are described. In addition, the relationships between size and structural measures of centralization, specialization, and formalization for nursing departments are identified. Also identified are the effect of different contexts on the structural measures of nursing departments were identified. Finally, the relationships between the quality of care and
nursing organizational structure are described. This is an exploratory study since these relationships had not been identified or examined prior to this study. Awareness as to those variables that directors of nursing perceived as having an influence on their decisions about design was increased.

This study does not address causality relationships. Cook and Campbell (1979) remind us that there is need for many tests to determine a causal relationship. It must be recognized that the research done in this study was field research, with no controls except in sampling. In this study, no manipulation of variables was done in order to measure the outcome or effect. Because the interrelationships of the variables were not known, due to lack of previous research, the question of causality was not addressed in this study. The results simply serve to point to relationships that will need further research from a causation perspective.

Many of the previous studies in the field of organization design used a case study approach. Because of the methodology of these studies, conclusions are only applicable to the specific sample. In turn, the sample is not representative of organizations in general nor, more specifically, health care organizations. Therefore, this study used a probability sampling approach, so as to provide a means to draw inferences about the larger
population. In studying the research questions in the nursing practice arena, a contribution was made to both nursing knowledge and organizational theory knowledge.

**Definition of Terms**

**Organizational Structure**

Pugh et al. (1968, 1969) defined organizational structure as consisting of five dimensions. These are (1) specialization, (2) standardization, (3) formalization, (4) centralization, and (5) configuration. These are the sum total of the ways in which labor is divided into distinct tasks, and in which coordination among the parts is achieved to meet the organizational goals. In hospital departments of nursing, the organizational structure is comprised of the delineation of nursing tasks (i.e., patient care, support services, management), the persons or groups of people who carry out those tasks, and the coordination of the people and tasks to meet the nursing department goals within broader hospital goals.

According to Hall (1982), structure serves two functions. The first function is that structures are intended to produce outputs (outcomes) and achieve organizational goals. Without structure, the organization cannot produce a service or product, nor can it achieve its' goals. Conversely, without goals, the organization has no reason for existence. Secondly, structures serve to
minimize or regulate the influence of individual variation. In this manner, the organizational outcomes become predictable and controlled.

The organizational structure can be diagrammed in an organizational chart and/or described in terms of its attributes. Organizational structures are dynamic in nature (Galbraith, 1977; Steiner and Miner, 1977) as organizations change to meet the varying demands over time such as advances in technology, market fluctuations, and leadership turnovers.

The Aston Group (Pugh et al., 1968) identified structural attributes or measures with which to compare various structures. For the purposes of this research, these structural measures were used to define the nursing organizational structures. These dimensions were:

1. **Centralization** of authority,
2. **Specialization** reflected by task differentiation, and
3. **Formalization** or the use of rules and procedures to control employee behavior.

Centralization:

Centralization was defined in this study as the total amount of control exercised over the participants and vested through the accumulation of authority and responsibilities in the various superiors along the whole
chain of supervision (Samuel and Mannheim, 1970). Samuel and Mannheims' (1970) Hierarchy of Control Index was used to measure centralization (See Appendix A for all instruments). Authority was determined by the total span of subordinates accountable to one superior directly as well as through other intermediate superiors (Samuel and Mannheim, 1970).

Based on the definition, Samuel and Mannheim (1970) developed a size standardized index of centralization. The structural control intensity (C) is computed relative to the range of the extremes possible within the organization. The instrument consists of one question: It requests that the data provider make a drawing of the organizational chart. To be included were the numbers of personnel reporting to each position throughout the department. Paper was provided for the directors/designee to draw their organizational structure. The data provider also had the option of attaching a copy of the organizational chart used at the organization.

The centralization score was calculated by totaling the number of subordinates at all levels in the organization after having identified the number of subordinates reporting to the ith member of the decision
unit. The following example illustrates the calculation of the centralization score.

\[ C = \frac{J - J_{\text{min}}}{J_{\text{max}} - J_{\text{min}}} = \frac{J - (n-1)}{\frac{[n(n-1)]}{2} - (n-1)} \]

where

\[ 0 < C < 1 \text{ and } n > 1 \]

\( C = \) structural control index from organizational chart
\( J = \sum_j \) cumulative sum of the number of subordinates at all levels
\( j = \) number of subordinates reporting to the \( i \)th member of the decision unit
\( n = \) total number of participants in the decision unit

\[
\begin{align*}
\text{j1} &= 19 \\
j2 &= 6 \\
j3 &= 1 \\
j4 &= 9 \\
j5 &= 4 \\
j6 \text{ through } j8 &= 0
\end{align*}
\]

\( J = 39 \)
\( n = 20 \)

\( J_{\text{max}} = \frac{n(n-1)}{2} = \frac{20(19)}{2} = 190 \)

\( J_{\text{min}} = n-1 = 20-1 = 19 \)

\[ C = \frac{39 - 19}{190-19} = \frac{20}{171} = .1169 \]
As can be seen in the example, the centralization score was then calculated from the information provided by the organizational chart. The possible score range was from greater than zero to one. The higher the score, the greater the degree of structural centralization in the organization. Conversely, the lower the score, the lesser the degree of centralization. For example, a centralization score of .0985 would identify a structure with a greater degree of centralization than an organization with a centralization score of .0024.

The standardized index of control has three advantages according to Samuel and Mannheim (1970). These are (1) being sensitive to the height of the structure as well as to the cumulative authority of each successive link in the control chain; (2) reflecting variations of span of control within and between levels of supervision; and (3) avoiding the view of the organization as a simple pyramid. Therefore, it is possible to apply this instrument to any organization in any setting.

Reliability has been reported by previous researchers (Sathe, 1974; Ford, 1979). The Kuder-Richardson (KR-8) reliability of the instrument is reported by these researchers as 0.799 (Ford, 1979) and 0.864 (Sathe, 1978). Instrument validity testing was not reported.

The centralization instrument has a history of utilization in previous research to identify relationships
between size and centralization by Routamaa (1985). Therefore, the instrument was judged to have construct validity. In the first pretest, the instrument collected the data that it purported to collect for analysis. The instrument was reviewed for clarity and relevance by nursing administration personnel and no changes were necessary. Therefore, this instrument was found to have content validity.

Specialization:

Specialization was defined as the degree of differentiation of a given work segment into separate specializations or categories of work commonly called jobs (Samuel and Mannheim, 1970). A job included all the similar positions of workers doing the same work. The greater the number of distinct jobs, the higher the level of differentiation or specialization in the organizations. Samuel and Mannheims' (1970) Specialization Index was used to measure specialization.

Samuel and Mannheim's (1970) measure of specialization was composed of two elements. The first element was functional differentiation. This was the degree of differentiation of a given work segment into separate specializations or categories of work (Samuel and Mannheim, 1970). A job included all similar positions of workers doing the same work. The greater the number of distinct
jobs, m, the higher the level of differentiation. However, this measure (m) alone did not identify the internal pattern of differentiation. It was an incomplete measure unless the internal distribution of workers per job was taken into account.

The standardized index developed by Samuel and Mannheim (1970) takes into account the number of job categories (m), the number of workers within the organization (n), and \( n_i \), the number of positions in job i where \( i = 1, 2, ... m \). This standardized model allows for comparison of patterns across departments.

The specialization instrument consisted of a listing of all functional areas within the nursing organization. This entailed listing the numbers of personnel by job title in each functional area such as medical, surgical, pediatric, maternal/child, psychiatric and/or other nursing areas. This was self-reported information.

Based on this data, the specialization score was then calculated in the following manner.
\[ F = - \frac{1}{\ln(m)} \sum_{n} \ln \left( \frac{\text{ni}}{n} \right) \]

F= specialization index

\( m = \) the number of distinct jobs within the department of nursing. ie. On one unit there may be 1 head nurse, 1 assistant head nurse, 3 advanced clinical nurses, 45 staff nurses, and 2 unit secretaries. There are 5 distinct jobs so that \( m = 5 \). These calculations were done for the whole department of nursing.

\( n = \) total number of employees in all jobs

\( \text{ni} = \) number of employees in the \( i \)th job

\( \ln = \) natural logarithm

Using the example below, the specialization score was calculated as follows.

\[
\begin{align*}
n1 &= 150 \\
n2 &= 15 \\
n3 &= 3 \\
n4 &= 5 \\
n5 &= 2 \\
n6 &= 1 \\
n7 &= 7 \\
n8 &= 4 \\
n9 &= 3 \\
n10 &= 1 \\
n11 &= 1 \\
n12 &= 1 \\
n13 &= 2 \\
n14 &= 4 \\
n15 &= 1 \\
n &= 200
\end{align*}
\]

\[
F = - \frac{1}{2.70805} (-.96853) = .3575
\]

The possible score ranged from zero and to one. The higher the score the greater the degree of specialization. The lower the score, the less specialization or job differentiation existed in the organization.
The KR-8 reliability as reported by Sathe' (1978) was 0.704 and by Ford (1978), 0.726. No instrument validity testing was reported. This instrument does reflect the concrete definition of specialization and it does measure what it purports to measure in its' operational definition. The instrument has a history of previous utilization in research, specifically by Routamaa (1985) in identifying relationships between specialization and size, location and ownership. Therefore, this instrument was found to have construct validity. The instrument was used to collect data in the first pretest and served to collect data that it purported to collect in the manner designated. Therefore, the instrument was found to have content validity.

Formalization:

Formalization, or the use of rules and procedures to control employee behavior, was defined as the extent to which the organization employs rules and regulations, and role defining documents, to prescribe employee behavior (Inkson et al, 1970). The Inkson, Pugh and Hickson (1970) subscale of formalization of role definition as revised by Sathe' (1974) was used. Revisions in language were made to fit the nursing context. For example the term head nurse was used instead of area manager.

This instrument consisted of seven questions of which four were multiple choice. The remaining three questions
were yes/no choices. All the questions addressed the existence and availability of written protocols. The responses were weighted. The possible score range was zero to nine. The higher the score the higher the degree of formalization and, conversely, the lower the score the lower the degree of formalization.

Sathe (1974, 1978) reported a KR-8 reliability of 0.826. Again, no validity testing was reported. This instrument is very simple in design. The instrument has been used in organizational research (Pugh et al., 1968; Routamaa, 1985) so that the instrument has construct validity. The instrument was evaluated by other nursing professionals for clarity and applicability in the nursing arena. In the first pretest, the instrument served to collect the data necessary for data analysis in the designated manner. Therefore, the instrument was found to have content validity.

**Organizational Environment**

In this study, organizational environment is defined by three variables. These variables have been identified in earlier research as having relationships with the organizational structure measures. The first variable is the location of the hospital, whether metropolitan or rural. The second variable was hospital type, whether for profit or non-profit. The third variable was size.
These environmental variables were selected because they have previously been identified in the literature as relating to the organizational structure (Pugh et al, 1968; Blau and Schoenherr, 1971; Leatt and Schneck, 1981; Routamaa, 1985). Specifically, hospital research and nursing research utilize these variables to describe the organizational environment of hospitals and nursing departments.

Hospital Location and Type

Organizational environment is the milieu in which the organization operates. In the management literature, the most common empirical definition of environment focuses on the element of stability or uncertainty (Ford and Slocum, 1977). This is reflected in the works of Burns and Stalker (1961), Thompson (1967), Lawrence and Lorsch (1967) and Duncan (1972).

Nursing exists in a health care environment that is experiencing much upheaval and change, as reflected in the health care organization and nursing literature review. In the current study, it was assumed that the nursing climate is uncertain. Therefore, this study did not examine the organizational environment aspect of uncertainty but rather expanded the definition of environment to describe the hospital milieu in which nursing departments exit.
Previous research has expanded the definition of environment beyond the original concept. Pugh et al. (1969) used several variables to define organizational environment, including size, ownership and location. Routamaa (1985) defined organizational environment by size, ownership, and location among other variables (i.e., method of operation).

The health services literature utilizes ownership (profit and non-profit), and location to describe hospital environment (Neuhauser and Anderson, 1972). Nursing literature (Haussman et al, 1976, 1977) also uses type and location of hospital as environmental variables influencing quality of care. Therefore, hospital location (whether metropolitan or rural) and type (whether profit or non-profit), were used to define organizational environment in this study.

Data on the hospital teaching status was collected so as to provide an additional description of the hospitals in the sample. This provided a framework in which to interpret the results.

The first part of the instrument consisted of three questions soliciting the type, location and teaching status of the hospital. The responses were circled by the respondent. A category of "other" was provided with a request for description. As is evident, this instrument
reflected the concreteness in definition of hospital environment, giving the instrument strong face validity.

The hospital type and location data provided by the directors was compared to the AHA database for the sampled hospital. There was 100 percent agreement in the databases. It was therefore assumed in this study that the data was reliable.

**Hospital Size**

In the organizational theory literature, organizational size is not defined and measured with any consistency (Ford and Slocum, 1977). Because of this inconsistency, it is difficult to generalize from the conclusions reported in the literature (Routamaa, 1985).

Size was found to have a relationship with the three structural measures utilized in the current research by Pugh et al (1969), Gringer and Yasai-Ardekani (1981), Leatt and Schneck (1982), Blau and Schoenherr (1971), Routamaa (1985). Most of the above studies defined size by number of employees however, some used other definitions in addition to number of employees or instead of number of employees [i.e., net assets (Pugh et al, 1969), number of beds (Leatt and Schneck, 1982)].

There is consistency in the health services literature in the definition of hospital size by the number of beds. There is some utilization of the number and types
of employees to define size both in the organizational literature and the health services literature (Ford and Slocum, 1977; Newhauser and Andersen, 1972, Leatt and Schneck, 1982). At this time, no standardized instruments are available in the literature.

Gupta (1980) empirically tested the congruence of three size measures. These measures were traditional, cycles of completion, and energy. The traditional size measure was defined as the number of employees in the organization. The cycles of completion approach was defined as the number of cycles completed by the organization. In nursing this would be the number of patients (beds) to which nursing care is provided. The energy approach measures the energy consumed and produced. The nursing personnel budget partially defines size by the energy consumed in the form of personnel cost. This study used the three measures of size.
For the purpose of this study, organizational size was defined as:

1. the mean number of beds utilized along with the occupancy rate;
2. the number of people responsible for the management of the department of nursing;
3. the number of people responsible for direct caregiving in the department of nursing;
4. the number of people responsible for providing staff support in the department of nursing; and
5. the cost of the personnel budget for the department of nursing.

The time frame utilized for the above measures was the 1988 calendar year because data was collected during 1989.

Number of beds has been used both in hospital organizational research and nursing research. However, it may not provide a complete picture of size. Therefore, this study incorporated both number of beds and occupancy rate. This data was self-reported data collected by open ended questions.

The number of management, direct caregivers, and support personnel defines the type of personnel in the department of nursing and was collected by open ended questions. The personnel budget, salaries plus benefits, for the nursing departments, was also collected by an open ended question. This was self-reported data.
The size measure as defined in this study utilized very concrete measures and was reflected in the questions used to collect the data. Because of the concrete nature of this data, number of beds, occupancy rate, numbers of personnel, and budget there was strong validity in the instrument. Questions may arise as to the reliability of the data because of collecting self-reporting data by means of a survey.

One indicator of data reliability was the comparison of reported number of beds to the AHA listing number of beds. In comparing these two pieces of data, there was 100 percent agreement in the two databases. All the subjects remained in the same number of bed categories from which they had been sampled. It was therefore assumed that the reported data in this study was reliable.

Quality of Care

Organizational goals are those statements of purpose that an organization identifies as its' purpose for existence, both short and long-term. Lawrence and Lorsch (1967), Drucker (1974), and Hall (1982) stress the importance of organizational goals as related to structure. Without goals, there is no reason for an organization to exist. In turn, without structure, the organization will not achieve its' goals.
Organizational effectiveness has been defined as the degree to which an organization realizes its' goals (Hall, 1982). Kovner (1972) defines effectiveness as the level of goal achievement. One ideal goal for hospitals is the provision of optimal health services to a given patient population (Kovner, 1972). In other words, one measure of organizational effectiveness for hospitals has been identified as the provision of quality patient care (Heydebrand, 1973; Hall, 1982). High quality of patient care indicates high organizational effectiveness.

It was assumed in this study that departments of nursing in acute care hospital settings share common goals. The reason for existence for any nursing department is to provide a service to society known as nursing care. Nursing care is "helping people, sick or well, from birth to death, with those activities of daily living that they would perform unaided if they had the strength, will and knowledge" (Henderson, 1980, p. 48). The purpose, embedded in this relationship between nurse and patient, is to "help the person gain or regain their independence, and when this is not possible, to cope with handicaps and irreversible diseases, or finally, to die with dignity when death is inevitable" (Henderson, 1980, p. 48).

The goal of the nursing department is the provision of quality patient care to those persons identified as needing nursing services. Using Hendersons' (1980)
definition of nursing, the degree to which independence is gained, handicaps and irreversible diseases coped with, and/or death with dignity achieved is the measure of how effective a nursing department is.

Heydebrand (1973) was the first to identify the RN/patient ratio concept in non-nursing literature. He concluded from his research of hospitals that perhaps the only measure which comes close to gauging the quality of patient care is the nurse/patient ratio. Empirical studies have shown that the registered nurse (RN) to patient ratio is one indicator of quality of care (Haussman et al, 1976, 1977). The higher the number of nurses to patients, the higher the quality of patient care provided. For the purposes of this study, the RN/patient ratio was used as a surrogate measure for quality of care. The lower the number of patients in the RN/patient ratio, the higher the quality of care. Conversely, the higher the number of patients in the RN/patient ratio, the lower the quality of care. For example, an RN/patient ratio of 1:20 would indicate that the quality of care would be low. This nurse would be less able to provide quality care to 20 patients. With an RN/patient ratio of 1:2, there would be one nurse for two patients. Therefore, the quality of care would be higher.

The data were collected by means of an open ended question. The data provider was asked to report the ratio
of RNs to the number of patients, for example 1/5, 1/8. This was self reported data.

As is evident, the RN/patient measure is a simple concrete means of assessing the quality of care. The instrument has content validity. There was no way to insure the accuracy of the data except by on-site visit and observation, and on-site observation would have had to been long enough to obtain an average of the measure. Because this type of data collection was beyond the time and financial constraints of this study, it was not possible to do on site data collection. Therefore, the data was assumed to be reliable.

**Variables Perceived to Influence Design**

The current study included a research question that addressed the director of nursings' perception of the influence of specific variables on organizational design decisions. As previously reported by Ford and Hegarty (1984), structure is influenced by decision makers perceptions. In other words, these perceptions serve as a filter on decision making about structure and in turn may lead to inappropriate actions.

The specific variables studied were size, type, and location of hospital; philosophy of nursing; purpose of the department of nursing; and method of assigning patient care. These variables have previously been identified in
the literature. Organizational design research identified organizational size, type and location as influencing organizational structure. Nursing authors identified nursing philosophy, nursing department purpose as influencing organizational structure decisions at the departmental level. At the patient care level, nursing authors identified patient care assignment patterns (e.g., primary, case management) as influencing organizational design decisions.

Directors of nursing were asked to identify the extent of influence the variables had on decision making to restructure the nursing department. A Likert Scale was used for data collection. The Likert Scale was based on a five point scale ranked as follows: (1) little or no influence, (2) little influence, (3) moderate influence, (4) large influence, and (5) a great influence.

**Descriptive Data**

Descriptive data were collected to provide a framework for interpretation of results. Data were collected on the tenure on top nursing executives as well as the time employed at the hospital, descriptions of recent organizational restructuring, and if the later was yes, which person (s) was (were) involved in decisions to restructure the nursing department.
Pretest 1

Prior to the current study, two pretests were performed. The first pretest provided an estimate of the survey return rate and feasibility of data collection. One hundred surveys were mailed out to acute care hospital directors of nursing with a usable survey return rate of 10 percent. The 10 percent return rate was used as a basis for estimating the number of surveys to be mailed for the current study.

The first pretest also served to test the feasibility of data collection as the instruments had not previously been used in the health care service industry. The same centralization, specialization, and formalization instruments used in the pretest were used in the current study. Ten surveys were returned completed. The data provided were usable for data analysis. One survey was returned incomplete and unusable for data analysis. The incomplete survey did not provide complete distribution of employees by job (specialization data). It was therefore concluded that the instruments could be used to collect needed data on the nursing organizational structures. The sample was too small to do any statistical testing.

Pretest 2

Prior to the current study, questions were raised about instrument reliability and a second pretest was done
to address the questions. Reliability is the ability to consistently reproduce the same results. Because the study used one data source for each nursing department, it was not possible to do internal reliability testing. Reliability of instruments was reported by previous researchers, but the research did not utilize health care organizations. Therefore, an attempt was made to examine the reliability of the organizational structure instruments in a nursing setting.

The pretest was designed so that the nursing administrators within one hospital would provide data on the whole nursing department, thus allowing reliability issues to be examined. The pretest was performed at one metropolitan non-profit hospital in a large midwestern city. The hospital had over 600 beds at the time of data collection. The survey was completed by the Vice President for Nursing and the seven nursing division Chairpersons (medical, surgical and operating rooms, pediatric, psychiatric, gerontological, obstetrics and gynecology, and community health).

The introduction to the study and the directions for the completion of the survey stated that the survey applied to the whole department of nursing. However, the data provided by the subjects consisted of information pertinent only to their own functional division. The Vice
President alone was able to provide nursing department-wide data.

In interviews with two chairpersons, it was discovered that the nursing divisions function as "independent hospitals" unaware of how the other divisions are organized or function. Because of the manner in which these seven divisions operate the survey was interpreted to pertain to their own division, not the nursing department as a whole. According to the two subjects interviewed, to have completed the survey about the whole nursing department they would have "sent the survey to the nursing research/statistics person" or by calling that same person and "soliciting the information". Had this been done, the information provided would have been identical for all nursing division subjects making the instrument appear reliable when actually the same person would have provided all the data.

The seven division heads provided data that was requested in the manner requested but for each division. The questions regarding the hospital type, location and teaching status were answered identically by all subjects so there was 100 percent reliability for those questions. Where it was possible to do reliability testing, it yielded strong results. The pretest results are in Appendix D.

The pretest made it apparent that the best source of information regarding the whole nursing department was the
nursing department head. The other individuals within the nursing administrative group had knowledge about the area in which they worked but not the whole department. Thus, for the purpose of data collection in the current study, data was obtained from the nursing department head.

**Sampling Plan**

Stratified random sampling was used to generate the needed study population. The benefit in using stratified random sampling was an increase in precision in the estimates of characteristics of the whole population by the creation of stratas (Cochran, 1977). In a sense, each strata became an independent population (Cochran, 1977). In turn, this technique maximized the variance between groups and minimized the variance within the groups (Cochran, 1977; Yamane, 1967) when the subjects were grouped by homogeneous strata.

Acute care general hospitals in the United States were stratified by the research variables: number of beds, type, and location. The necessary sample size from each strata was randomly selected from those hospitals in each strata.

By using stratified random sampling, each hospital within the strata had an equal probability of selection (Yamane, 1967; Hess et al, 1975; Cochran, 1977). Because the variables were not randomly present in the population,
the only way to ensure the presence of the variables in the sample was to stratify hospitals by number of beds, type, and location.

Random sampling alone was not adequate because of the skewness of the distribution towards the smaller hospitals. Larger hospitals would not have been as apt to be selected by random sampling as the smaller hospitals as demonstrated in Table 1.

Table 1

<table>
<thead>
<tr>
<th>Number of Beds</th>
<th>Number of Hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>99 or less</td>
<td>2468</td>
</tr>
<tr>
<td>100 - 199</td>
<td>1312</td>
</tr>
<tr>
<td>200 - 299</td>
<td>725</td>
</tr>
<tr>
<td>300 - 399</td>
<td>423</td>
</tr>
<tr>
<td>400 - 499</td>
<td>215</td>
</tr>
<tr>
<td>500 and up</td>
<td>312</td>
</tr>
<tr>
<td>total</td>
<td>5455 (AHA, 1988)</td>
</tr>
</tbody>
</table>

However, if stratified random sampling had been done solely by number of beds, hospital type (profit, non-profit) would not have been adequately represented across the sample. The distribution of hospitals by type and number of beds was not random, therefore, both variables had to be considered for stratification to ensure adequate representation in the sample. General acute care hospitals
in the United States for 1987, stratified by type and number of beds, are seen in Table 2.

Table 2

Number of General Acute Care Hospitals
by Number of Beds and Type

<table>
<thead>
<tr>
<th>Number of Beds</th>
<th>Non-Profit</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>99 or less</td>
<td>2108</td>
<td>360</td>
</tr>
<tr>
<td>100-199</td>
<td>1016</td>
<td>296</td>
</tr>
<tr>
<td>200-299</td>
<td>616</td>
<td>109</td>
</tr>
<tr>
<td>300-399</td>
<td>400</td>
<td>23</td>
</tr>
<tr>
<td>400-499</td>
<td>197</td>
<td>13</td>
</tr>
<tr>
<td>500 +</td>
<td>308</td>
<td>4</td>
</tr>
<tr>
<td>total</td>
<td>4654</td>
<td>805</td>
</tr>
</tbody>
</table>

N = 5455 (AHA, 1988).

The third research variable was hospital location, whether metropolitan or non-metropolitan/rural. In 1987, there were 2839 metropolitan general acute care hospitals in the United States (AHA, 1988). This is equivalent to 52.04% of the total number of hospitals. There were 2616 (48%) non-metropolitan acute care hospitals during the same year (AHA, 1988). The distribution of acute care hospitals by number of beds, type and location is summarized in Table 3 based on the 1987 AHA acute care hospital listing. There are a total of 24 stratas or sample cells when stratified by these variables.
Table 3

Number of Acute Care Hospitals by Beds, Type and Location

<table>
<thead>
<tr>
<th># beds</th>
<th>Metropolitan</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-Profit</td>
<td>Profit</td>
</tr>
<tr>
<td>99 or less</td>
<td>410</td>
<td>176</td>
</tr>
<tr>
<td>100-199</td>
<td>526</td>
<td>223</td>
</tr>
<tr>
<td>200-299</td>
<td>491</td>
<td>102</td>
</tr>
<tr>
<td>300-399</td>
<td>371</td>
<td>23</td>
</tr>
<tr>
<td>400-499</td>
<td>197</td>
<td>13</td>
</tr>
<tr>
<td>500 &amp; more</td>
<td>303</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>2298</td>
<td>541</td>
</tr>
</tbody>
</table>

(AHA, 1988)

Stratification by teaching status was considered and rejected. In 1985, there were three for-profit teaching general acute care hospitals (AHA, 1987). This was approximately .05% of the total general acute care hospitals. In the same year there were 286 not-for-profit teaching hospitals or approximately 5% (AHA, 1988). Teaching hospitals appear to have a direct relationship with number of beds, the opposite of that seen in Table 1 and 2. The number of teaching hospitals, stratified by size, is summarized in Table 4.
Table 4

Number of General Acute Care Teaching Hospitals by Size

<table>
<thead>
<tr>
<th>Number of beds</th>
<th>Number of hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>99 or less</td>
<td>1</td>
</tr>
<tr>
<td>100 - 199</td>
<td>13</td>
</tr>
<tr>
<td>200 - 299</td>
<td>39</td>
</tr>
<tr>
<td>300 - 399</td>
<td>59</td>
</tr>
<tr>
<td>400 - 499</td>
<td>69</td>
</tr>
<tr>
<td>500 +</td>
<td>186</td>
</tr>
<tr>
<td>total</td>
<td>367</td>
</tr>
</tbody>
</table>

(AHA, 1988)

In other words, 51 percent of the teaching hospitals had 500 beds or more. However, only three percent of the total number of general acute care hospitals in the United States were teaching hospitals of 500 or more beds. By further stratifying the number of teaching hospitals by hospital location and type, the sample sizes became too minute for statistical testing. Therefore, in evaluating the cost, time, and benefits of stratifying by teaching status, it was decided to reject further stratification. Instead, data was collected that identified those hospitals in the study that were teaching hospitals.

Total sample size was calculated by using the formula suggested by Yamane (1967) for determining sample size when
doing proportional sampling. The formula took into consideration the strata sample size (Nh), and the proportion (Ph) in the strata sample that would meet the Ho criteria. In other words, for this study the Ph is that proportion of the sample that was estimated to be centralized, specialized, and formalized. Because there were no previous studies from which to estimate the proportion, the most conservative estimate was used as suggested by Cochran (1977). A proportion estimate of .5 was the most conservative, producing the largest sample size.

The formula suggested by Yamane (1967) was also reported in Cochran (1977) for determining sample size for proportional sampling. Hess et al (1975) presented the same formula for determining sample size for proportional sampling, the difference being that the formula had been factored. Hess et al (1975) recommended a Ph of .2 as being adequate for most proportional sampling estimates. The formula for determining sample size (Yamane, 1967) is as follows.
\[ n = \frac{N \cdot Nh \cdot Ph \cdot Qh}{N (D^2) + Nh \cdot Ph \cdot Qh} \]

where \( n \) = sample size

\( Nh \) = strata sample size

\( Ph \) = proportion in strata sample that meet Ho criteria

\( Qh = 1 - Ph \)

\( N \) = sum of the \( Nh \)'s (population size)

\( D \) = desired variance

(Yamane, 1967, pg. 154).

Therefore, using the data from Table 3 above,

\[ N = 5455 \]

\[ n = \frac{N \cdot Nh \cdot Ph \cdot Qh}{N (D^2) + Nh \cdot Ph \cdot Qh} = \frac{(N) \cdot Ph \cdot Qh}{N (D^2) + Ph \cdot Qh} = \frac{5455 \cdot (.5) \cdot (.5)}{5455 \cdot (.05)^2 + (.5) \cdot (.5)} = 1363.75 = 98.2 \approx 98 \]

A sample size of 98 was necessary for this study based on the 1988 AHA listing of acute care hospitals.

Stratification for the study was done using the AHA listing of acute care hospitals in the continental United States. The AHA listing identified hospitals by several variables, including the research variables. Hospitals were coded by the three research variables. Then, using the software program Quattro Pro, the hospitals were sorted according to numbers of beds, location, and type. Random checks were implemented to verify the accuracy of the entries.
To select the strata sample size, proportional sampling allocation was done as developed by Yamane (1967). Proportional allocation compares favorably with the other allocation methods (Yamane, 1967). At the same time, proportional allocation is considered simpler and more convenient than the other methods (Yamane, 1967). The proportional allocation formula used to identify strata sample sizes follows.

\[ nh = \frac{Nh}{N} \times n \]

where \( nh \) = sample strata size

\( Nh \) = number of hospitals in strata

\( N \) = population size

\( n \) = total sample size

(Yamane, 1967, pg. 124) Simply, this shows that \( n \) should be allocated according to \( Nh/N \) (Yamane, 1967). The strata sample sizes for this study based on the AHA listing acute care hospitals in the United States are summarized below in Table 5. The numbers were rounded up when there was a decimal of .5 or above.
<table>
<thead>
<tr>
<th>Beds</th>
<th>Metropolitan</th>
<th>Rural</th>
<th>Metropolitan</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 100</td>
<td>7</td>
<td>3</td>
<td>31</td>
<td>3</td>
</tr>
<tr>
<td>100-199</td>
<td>9</td>
<td>4</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>200-299</td>
<td>9</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>300-399</td>
<td>7</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>400-499</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>500 +</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>9</td>
<td>44</td>
<td>4</td>
</tr>
</tbody>
</table>

(AHA, 1988)

Random sampling within the strata was done to select the sample hospitals using the Quattro c program. Random sampling was done as it saved time, effort, and cost (Cochran, 1977; Yamane, 1967) and ensured the equal opportunity of selection for the hospitals in each strata. In turn, number of beds, type, and location of hospitals were adequately represented in the sample. The AHA hospital listings was used for each strata's sampling.
Data Collection

From an ideal research perspective, the use of interviews of subjects rather than surveys is the preferred method for data collection in research (Levy and Lemeshow, 1980). It is recognized in the research literature that it is possible that those subjects who respond to a survey are different from the subjects who do not respond to the survey (Levy and Lemeshow, 1980). Therefore, questions can arise about the generalizability of the conclusions. However, because of time and money constraints related to the current study, it was not possible to interview all the directors of nursing in the sample. Instead, surveys were used to collect the data. The differences of the respondents/non-respondents could be a potential problem. The researchers' name and phone number were provided to those in the study in case questions arose on the part of the subjects.

The surveys were mailed to the Vice President/Directors of Nursing at the sample hospitals during the late summer and fall of 1989. The survey was to be completed by the directors of nursing or their designee. The name and phone number of a contact or resource person at the hospital was solicited in case there were problems understanding the data (e.g., legibility). Upon completion of data analysis said information was destroyed. In this manner, confidentiality was maintained.
IRB approval was received from Case Western Reserve University. Consent was obtained from the subjects after information regarding the purpose of the study was provided. The return of the completed instrument demonstrated consent to participate (See Appendix B for consent).

The surveys were mailed out with a letter from the researcher explaining the study, along with the consent and postage paid return envelope. A cover letter from the researchers' dissertation committee chairman at that time in support of the nursing administration research was included.

The number of surveys mailed out was based on the 10 percent return rate in the first pretest. The surveys were mailed out in batches by sample cell. Postcards were mailed 4 weeks after the surveys were mailed (See Appendix C for postcard). The postcards served two purposes. They served to thank those who had already mailed in their survey as well as to remind those who had not mailed it back to please put it in the mail.

Second mailings of surveys were needed for the metropolitan hospital sample cells of 200 beds and more. Random selection with replacement was used in selecting for the second mailing. For some sample cells, the return rate far exceeded the number of subjects needed, especially in the rural cells. The return rate did provide the number
surveys needed for a total of 98 subjects. In those cells with extra surveys, subject selection was based on the completion of the survey. The return rate by sample cell is summarized in Table 6.

There were 1051 surveys mailed out. The total survey return rate was 15 percent. A number of those surveys were incomplete and necessitated phone calls to complete or clarify the data. Two pieces of data were commonly omitted. These were the nursing budget and the average number of nursing shifts per week. Other pieces of missing data were organizational chart, RN/patient ratio, and/or some numbers of employees.

Four letters were received from nursing directors stating they could not participate in the study because of workload. Nine surveys were returned without data accompanied by a note that they could not participate in the research due to workload. One survey was returned with comments but without data of any kind. These surveys were not counted in the return rate.
Table 6  
Sample Cell Sizes and Return Rates  

<table>
<thead>
<tr>
<th>Beds</th>
<th>Metropolitan</th>
<th>Rural</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Profit</td>
<td>Non-Profit</td>
<td>Profit</td>
</tr>
<tr>
<td>&lt;100 beds</td>
<td>3 (10)</td>
<td>7 (9)</td>
<td>3 (6)</td>
</tr>
<tr>
<td>100-199</td>
<td>4 (6)</td>
<td>9 (18)</td>
<td>1 (4)</td>
</tr>
<tr>
<td>200-299</td>
<td>2 (2)</td>
<td>9 (15)</td>
<td>0 (1)</td>
</tr>
<tr>
<td>300-399</td>
<td>0</td>
<td>7 (7)</td>
<td>0</td>
</tr>
<tr>
<td>400-499</td>
<td>0</td>
<td>4 (4)</td>
<td>0</td>
</tr>
<tr>
<td>500+</td>
<td>0</td>
<td>5 (5)</td>
<td>0</td>
</tr>
<tr>
<td>total</td>
<td>9 (18)</td>
<td>41 (58)</td>
<td>4 (11)</td>
</tr>
</tbody>
</table>

Note:  \( x \ (y) = \)

\( x \): number needed in sample cell  
\( (y) \): number of returned surveys  

Analysis of Data  

For data analysis purposes, due to the low numbers in the sample cells above 300 beds, the stratas of 300 beds and more were collapsed into one strata. The new strata was labeled 300 + beds. The new sample cell sizes are summarized in Table 7. Instead of 24 cells, there were 16 sample cells in the study of which 13 were used for data analysis. Three cells contained no subjects.
Table 7
Sample Cell Sizes Used for Data Analysis

<table>
<thead>
<tr>
<th>Beds</th>
<th>Metropolitan</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Profit</td>
<td>Non-Profit</td>
</tr>
<tr>
<td>&lt;100 beds</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>100-199</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>200-299</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>300+</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>total</td>
<td>9</td>
<td>41</td>
</tr>
</tbody>
</table>

The analysis of data was done using the QuattroPro and SPSSPC+ programs. The only modification made in the program was to change the Quattro variance formula. The Quattro variance formula was for the population n. Therefore, the formula was modified to n-1 for the sample variance.

Descriptive statistics were used to describe the sample. The influence of the different organizational variables on the restructuring decision making was addressed using descriptive statistics as well. Analysis of variance (ANOVA) tests were used to test the effect of hospital location and type on the organizational structure. Regression was used to test the relationship between quality of care, the RN/patient ratio, and the nursing
organizational structure. In this manner each of the research questions was addressed.
CHAPTER 4

The directors of nursing in the sample are described followed by a description of the nursing departments in the study. The results addressing each research question are then reported.

Sample Description

Data were collected to provide a framework for interpretation of results. The hospital number of beds, location, type and teaching status were used to stratify the hospitals. Data regarding the employment in the nursing director positions and in the hospitals were collected. Descriptions of recent restructuring were collected along with the reasons for the restructuring and the people making the decisions to restructure. Lastly, the RN/patient ratios data were collected as indicators of the quality of care.

Hospital Number of Beds, Location, Type, and Teaching Status

The sample was selected by stratified random sampling based on the three research variables number of beds, hospital location and hospital type. By number of beds, there were 44 hospitals with less than 100 beds, 23 between 100-199 beds, 13 between 200-299 beds, and 18 with 300 beds or more. There were 48 rural and 50 metropolitan hospitals.
in the sample. There were 13 profit and 85 non-profit hospitals.

To better describe the sample, data regarding the hospital teaching status were collected. No definition of teaching hospital was provided in the instrument. Out of the 98 hospitals in the study, 70 nursing directors identified their hospitals as teaching hospitals. This was a disproportional high number of teaching hospitals for the sample based on the numbers of teaching hospitals in the population. Some directors commented that they were the clinical site for nursing, medical, practical nursing, nursing aide, and tech students. As was evident, "teaching hospital" had a unique meaning to each respondent. While the directors of nursing labeled the hospital as a teaching hospital, they used a different criteria than the AHA to designate teaching hospital status.

The AHA defines teaching hospitals as membership in the Council of Teaching Hospitals (AHA, 1991). The AHA acute care hospital listing used for sampling purposes in this study was based on this definition of teaching hospital (AHA, 1991). Therefore, this may explain the differences in data. Other criteria used by the AHA to define teaching hospital was the existence of an approved residency program and medical school relationship to the American Medical Association.
Nursing Directors Length of Time in Department Head Positions

The sampled nursing directors had been in the department head position anywhere from less than two years to more than 14 years. Thirty four department heads had been in the position less than two years. Thirty directors had been in the position for 2-5 years. Thirteen directors for 6-9 years and 12 directors 10-13 years. Nine directors had been in the department head position 14 years or longer. One respondent wrote in "other" without any comments or explanation.

Nursing Directors Length of Time Employed By Hospital

For the total sample, the average length of time employed by the hospital was 9.3 years. The longest time employed was 34 years and the shortest .08 years. The majority of the department heads had been at the hospital for longer lengths of time so that they had moved up into the department head positions from other positions within the same institution. However, the distribution was bimodal. In other words, directors of nursing had been employed by the hospital for either a short or long time. Very few nursing directors had been at the hospital for a medium range of time.
Size

Four measures of size defined the hospitals: number of hospital beds, occupancy rate, numbers of nursing employees and nursing budget.

Number of Beds

Data collected identified the mean number of beds utilized during calendar year 1988. The smallest hospitals consisted of 8 beds and the largest 916 beds. For the total sample, the average number of beds was 163 (s.d. = 164.91). The large range of numbers of beds speaks to the large variance in the sample.

Stratified sampling was done using number of beds as a stratifying variable, ensuring the selection of subjects across all the sizes needed in the study. Therefore, the high standard deviation was not unexpected in this situation.

Occupancy Rates

The bed occupancy rate for the total sample ranged from a high of 100 percent to a low of 10 percent. The average occupancy rate for the sample was 59 percent (58.87, s.d. = 18.93).

Number of Nursing Employees

The number of employees in the nursing departments was broken down into three categories. These categories were nursing caregivers, managers and support staff. Caregivers were any nursing staff who provided direct
patient care on a regular basis. Managers were those from the head nurse position up to and including the nursing director. Support staff were those who were not in the line positions and provided support to staff such as nurse educators, clinical specialist, and/or quality assurance personnel.

The average number of caregivers in the sample was 251.14 (s.d. = 248.73) with a high of 1078 and a low of 6. The sample variance is extremely large reflecting the diversity of numbers of caregivers in the nursing departments.

The average number of managers for the nursing departments in the sample was 14.61 (s.d. = 11.68) with a high of 62 and a low of 1. For the department which consisted of one manager, that person was both the director of nursing and head nurse for the hospital. Again, a large variance was seen.

The number of support staff for the sample nursing departments ranged from a high of 150 to a low of zero. The average number of support staff was 25.68 (s.d. = 34.23). The standard deviation was larger than the mean reflecting the extremely large variance in this group. In other words, the group was more dissimilar than similar.

For this sample, the smallest category of employee was nursing managers; this category also had the smallest standard deviation. In the sample, using these averages,
there was .06 managers per caregiver. That means there were, on the average, 16.73 caregivers per manager in the sample. On the other hand there was .10 support staff per caregiver or 9.65 caregivers per support staff personnel. Using these same averages, by combining caregivers plus support staff, nursing managers had 18.47 employees for whom they were responsible.

Nursing Personnel Budget

The last element used to define size was the personnel budget of the nursing department. Seventy five of the 98 respondents provided this data. However, 23 respondents did not provide any numerical data, though some provided comments. Phone calls were made to those who did not comment in an attempt to determine why this data was not provided. Six directors replied that they did not share this information outside of their institution. Two respondents commented that it was too difficult to access the information and fifteen reported that they did not have this information available to them. It was surprising that 17% (n=17) of the nursing department heads did not have access to their nursing budget.

Of the directors who did provide budget data, 50% were directors of larger hospitals. Because of the lack of sufficient data across the sample, nursing personnel budget was not used in statistical testing of hypothesis.
Guptas' (1980) results identified the empirical congruence between the three measures of size. Correlations between the number of beds and number of caregivers, managers and support staff identified strong relationships between number of beds and number of caregivers ($r=.91$), number of managers ($r=.87$), and number of support staff ($r=.56$). Therefore, to reduce redundancy and decrease the probability of error by data manipulation, number of beds alone was used for statistical (correlation) testing.

**Quality of Care**

The indirect measure of quality of care was the RN/patient ratio. For the purposes of calculating means and standard deviations and statistical testing, the RN/patient ratios were converted into decimal numbers. To be able to interpret the results, the numbers were converted back into ratios.

Guilford (1954) discusses the reduction of proportional ratios into decimal number for statistical purposes. His discussion was based on earlier research which successfully employed this mathematical strategy. Therefore, this study employed this mathematical technique.

The total sample RN/patient ratio mean was 1 nurse to 5 patients (1:5 or .20, s.d.=.12). The lowest number of patients to one nurse was a ratio of RN/patients of 1:2
(.5). The highest number of patients to one nurse was a ratio of 1:20 (.05).

In examining the frequency distribution table, there was a cluster at the 1:5 ratio with a very long right tail. The peak at the 1:5 ratio had 29 subjects. The long tail ranged up to a ratio of 1:20. These results are summarized in Table 8.

Table 8

Frequency Distribution of RN/Patient Ratios

<table>
<thead>
<tr>
<th>RN/Patient Ratios</th>
<th>Number of Departments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:2</td>
<td>7</td>
</tr>
<tr>
<td>1:3</td>
<td>5</td>
</tr>
<tr>
<td>1:4</td>
<td>11</td>
</tr>
<tr>
<td>1:5</td>
<td>24</td>
</tr>
<tr>
<td>1:6</td>
<td>17</td>
</tr>
<tr>
<td>1:7</td>
<td>6</td>
</tr>
<tr>
<td>1:8</td>
<td>8</td>
</tr>
<tr>
<td>1:9</td>
<td>0</td>
</tr>
<tr>
<td>1:10-1:20</td>
<td>20</td>
</tr>
<tr>
<td>total</td>
<td>98</td>
</tr>
</tbody>
</table>

Nursing Shortage

Data were collected describing the nursing directors' experiences with a nursing shortage. Eighty one nursing
directors reported that they had experienced a nursing shortage and 17 directors responded that they had not experienced a shortage. As is evident, a majority in the sample had experienced a shortage of nurses during 1988.

To better describe the nursing shortage, data were collected defining the percent of the budgeted nursing positions that remained vacant, on the average, during calendar year 1988. The average percent of budgeted positions that remained vacant was 8.69 (s.d. = 7.49). The high for the total sample was a 37 percent vacancy and the low was no vacancy.

Recent Nursing Department Restructuring

Data were collected describing whether there had recently been any restructuring and what that change was in the nursing department. The reasons for the restructuring were also solicited. Sixty percent (n=59) of those directors in the study described recent restructuring that had occurred in their nursing departments.

Nineteen nursing directors identified specific reasons for the restructuring and 16 of the 19 identified budgetary constraints as the reason for restructuring changes. A shortage of nurses was identified by 9 subjects as their reason for restructuring. Other reasons given for restructuring included the desire to increase autonomy, responsibility and accountability of nursing personnel.
Some respondents identified more than one reason for restructuring.

Table 9

Distribution of Nursing Department Restructuring Data

<table>
<thead>
<tr>
<th>Restructuring Change</th>
<th>Number of Departments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decentralization</td>
<td>12</td>
</tr>
<tr>
<td>Inclusion of non-nursing services</td>
<td>9</td>
</tr>
<tr>
<td>Elimination of management layer and/or position</td>
<td>9</td>
</tr>
<tr>
<td>Head Nurse acquired 24 hour responsibility</td>
<td>7</td>
</tr>
<tr>
<td>Added nursing administration positions</td>
<td>7</td>
</tr>
<tr>
<td>Changed position titles</td>
<td>6</td>
</tr>
<tr>
<td>Downsizing</td>
<td>6</td>
</tr>
<tr>
<td>Shorter work week for unit personnel</td>
<td>6</td>
</tr>
<tr>
<td>Realignment of reporting relationships</td>
<td>5</td>
</tr>
</tbody>
</table>

The most common restructuring implemented by the nursing departments was "decentralization." It was unclear what was meant by this response since this term was not described nor defined by any of the respondents. Table 9 summarizes the distribution of recent restructuring changes in the nursing departments.

Other changes that involved decentralization, such as eliminating layers of managers or management positions,
that were not identified as decentralization by the respondents were tabulated separately. When combined, decentralization plus elimination of manager layers or managers, 21 nursing departments had recently implemented decentralization strategies.

The inclusion of non-nursing services into the nursing department was the second most common restructuring change. The nursing department head in turn was promoted to a Vice President for Patient Services position. Other patient services realigned under the new vice president position were social services, physical therapy, housekeeping and surgical services.

More nursing departments phased out management positions (n=9) than those that added management positions (n=7). Along with the shift in number of managers, head nurses acquired 24 hour accountability for their nursing units.

Some respondents identified the changing of position titles. These included Clinician III to Head Nurse, Division Director to Associate Nursing Administrator, Head Nurse to Clinical Manager, and Director of Nursing to Vice President for Nursing Services/ Patient Services. These changes appear to imply a shift from clinical titles to managerial titles.

"Downsizing" and/or "streamlining" were identified as recent restructuring changes that had been implemented.
No details were given as to how many or at what level positions had been eliminated nor as to how the downsizing was accomplished (attrition and/or lay-off's).

Except for the head nurse changes, all the restructuring described above was nursing department wide. At the unit level, restructuring changes had also been implemented. These changes involved the implementation of shorter work weeks (24-36 hours), implementations of clinical ladders (n=2), conversion of LPN position into RN positions (n=2), and the implementation of primary nursing (n=1) or modular nursing (n=1). Adding other services—such as long term care units and home health services (n=1), and cross training and sharing of staff across services (n=1)—were also identified as restructuring changes that had been implemented recently within the nursing departments.

For this sample of nursing departments a large number of restructuring changes were implemented. This finding supports the notion that nursing directors need a nursing organizational design knowledge base from which to make design decisions.

**Persons Making Decisions To Restructure**

**The Nursing Department**

All the nursing directors responded when asked who made the decisions to restructure the nursing department. Sixty two percent (n=61) selected more than one response,
with 37 selecting only one response for a total of 174 responses.

Seventy six percent (n=75) of the subjects selected the nursing department head as the person who made the decision to restructure the nursing department. The next most common response (46%) identified the senior nursing administrative staff as involved in the decision making. Nursing personnel, nursing department head plus senior nursing administrative staff, were identified by a majority of directors, 69 percent (n=68), as making the decision to restructure the nursing department. On the other hand, these results indicated that in 23 nursing departments, the nursing director did not make the decision to restructure.

The hospital chief executive officer (CEO) was identified by 37 percent (n=36) of the nursing directors as making the decision to restructure the nursing department. Ten nursing directors identified the senior hospital administrative staff as involved in the decision making. These two groups of personnel, hospital CEO and senior management staff, function outside the nursing department but within the hospital. It was assumed in this study that the nursing directors report to the hospital CEO.

Four subjects identified consultants as the ones making the decisions to restructure. Consultants function
externally to the nursing department as well as externally to the hospital. This could mean that the nursing director and the hospital management team relinquished the control over the decision making.

Other people involved in the decision making about the nursing organizational structure were identified in comments by the nursing directors. These included nursing staff (n=3), head nurses (n=3), nursing division heads (n=1) and charge nurses (n=1). The board of directors was identified by one director.

Resolution of Research Questions

Research Question #1: To what extent do acute care hospital directors of nursing perceive size, type, and location of the hospital; philosophy of nursing; purpose of the department of nursing; and method of patient assignment as influencing organizational design decisions?

The first research question addressed the extent of influence that a variety of identified factors had on the decisions about the restructuring of the nursing departments. Respondents indicated on a five point Likert scale the degree of influence each of the six variables was perceived to have on restructuring decisions. Responses
outside the Likert scale range (i.e., 0,6) were excluded from statistical analysis.

The first three variables to be ranked--hospital size, type and location--were the organizational environment variables studied in this research. They have previously been identified in the literature as having relationships with the structural measures. It must be noted that they are external to the department of nursing, describing the organizational environment in which the nursing departments exist. The nursing philosophy and purpose variables were identified from the nursing literature as influencing decision making. These variables are internal to the nursing department. The last variable, patient assignment pattern, was identified in the nursing literature as well and is a patient care unit organizational structure variable.

Ordinal value containing the median was chosen as the ranking value. In turn, the median value identified the nursing directors degree of perceived influence for the given variable. For this sample of nursing directors, four of the variables, size, purpose, philosophy, and patient assignment pattern, were tied for highest rank for influencing design decisions (Table 10). These variables were followed by type of hospital (profit, non-profit) and location of hospital (rural, metropolitan) lastly perceived to have the weakest influence.
Table 10

Variables Influencing Decision Making About the Nursing Organizational Structure

<table>
<thead>
<tr>
<th>Variable</th>
<th>Likert Ranking</th>
<th>Median Likert Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>5 6 17 33 36</td>
<td>4</td>
</tr>
<tr>
<td>Location</td>
<td>30 24 17 16 10</td>
<td>2</td>
</tr>
<tr>
<td>Type</td>
<td>12 13 26 28 16</td>
<td>3</td>
</tr>
<tr>
<td>Philosophy</td>
<td>4 7 15 33 39</td>
<td>4</td>
</tr>
<tr>
<td>Purpose</td>
<td>0 3 11 44 39</td>
<td>4</td>
</tr>
<tr>
<td>Patient assignment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pattern</td>
<td>3 3 14 46 30</td>
<td>4</td>
</tr>
</tbody>
</table>

Other factors that influenced the decision making in restructuring nursing departments were identified in comments by the directors of nursing. Cost, in the form of budgetary constraints, was identified by five directors. Five directors identified availability of professional staff as an influence. The variety of services offered by the nursing department was identified by four directors as was philosophy of nursing management. The skills and educational preparation of administrative (leadership) staff and nursing staff was identified by three directors.
as having influence when making nursing organizational design decisions.

Total hospital factors influencing decision making were also identified. Hospital administration (n=2), hospital strategic directions (n=2), and quality of support services (n=1) were also identified as influential in decision making. These variables were identified by directors of larger hospitals, primarily in metropolitan locations. Many other factors were identified and these were quality assurance and risk management; preferences of the chief nursing officer; staffing needs; work load; blending practice, education and research; and outside regulatory agencies and reimbursement methods.

Research Question # 2

Research Question # 2: To what extent are the organizational structures utilized by the nursing departments in acute care hospital settings centralized, specialized and formalized?

The second research question explored the nursing organization as defined by the three organizational structure variables in this study. These variables were degree of centralization, specialization and formalization.
Centralization Scores

The centralization score had a possible range of 0.0 to 1. The higher the score, the higher the degree of centralization. This sample of nursing departments had a relatively low mean centralization score of 0.03 (s.d. = 0.04). The highest score was 0.17 and the lowest was 0.0. Eighty six percent (n=85) of the subjects fell within one standard deviation from the mean. The frequency distribution results are seen in Table 11.

In summary, the centralization scores in the sample were concentrated at lower levels of the range. The small variance speaks to the similarity in the degree to which nursing departments had low levels of centralization.
Table 11

**Distribution of Centralization Results**

<table>
<thead>
<tr>
<th>Centralization Score</th>
<th>Number of Hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>.00 - .009</td>
<td>33</td>
</tr>
<tr>
<td>.01 - .019</td>
<td>24</td>
</tr>
<tr>
<td>.02 - .029</td>
<td>13</td>
</tr>
<tr>
<td>.03 - .039</td>
<td>6</td>
</tr>
<tr>
<td>.04 - .049</td>
<td>2</td>
</tr>
<tr>
<td>.05 - .059</td>
<td>2</td>
</tr>
<tr>
<td>.06 - .069</td>
<td>3</td>
</tr>
<tr>
<td>.07 - .079</td>
<td>3</td>
</tr>
<tr>
<td>.08 - .099</td>
<td>2</td>
</tr>
<tr>
<td>.10 +</td>
<td>8</td>
</tr>
<tr>
<td>total</td>
<td>98</td>
</tr>
</tbody>
</table>

**Specialization Scores**

The possible range for the specialization scores was a low of 0.0 to a high of 1. The nearer the score to 1, the higher the degree of specialization and conversely, the lower the number the lower the degree of specialization. The mean specialization score for the sample was 0.64 (s.d. = 0.17), reflecting a moderate degree of specialization. The highest score in the sample was
0.91 and the lowest score 0.02. The frequency distribution of the specialization scores can be seen in Table 12.

As can be seen from these results, nursing departments in the study had a moderate degree of specialization. The distribution was very narrow, with 78 percent of the subjects falling within one standard deviation from the mean. In other words, these departments were more similar than dissimilar in the degree of specialization.

Table 12

Distribution of Specialization Results

<table>
<thead>
<tr>
<th>Specialization Score</th>
<th>Number of Hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; .49</td>
<td>11</td>
</tr>
<tr>
<td>.50 - .59</td>
<td>27</td>
</tr>
<tr>
<td>.60 - .69</td>
<td>24</td>
</tr>
<tr>
<td>.70 - .79</td>
<td>23</td>
</tr>
<tr>
<td>.80 - .89</td>
<td>12</td>
</tr>
<tr>
<td>.90 - .99</td>
<td>1</td>
</tr>
<tr>
<td>total</td>
<td>98</td>
</tr>
</tbody>
</table>

Formalization Scores

The formalization scores clustered at the upper end of the range. The possible score range was a low of 0 and
a high of 9. The higher the score, the higher the degree of formalization.

The sample average was 8.15 (s.d. = 0.92) with a high score of 9 and a low score of 4. Ninety percent (n=88) of the nursing departments fell within one standard deviation from the mean. These results show a trend towards a high degree of formalization or a high use of rules, policies and procedures in controlling employee behavior. The frequency distribution table is seen in Table 13.

Table 13

Distribution of Formalization Results

<table>
<thead>
<tr>
<th>Formalization Scores</th>
<th>Number of Hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 7.0</td>
<td>8</td>
</tr>
<tr>
<td>7.0 - 7.9</td>
<td>15</td>
</tr>
<tr>
<td>8.0 - 8.9</td>
<td>53</td>
</tr>
<tr>
<td>9.0</td>
<td>22</td>
</tr>
<tr>
<td>total</td>
<td>98</td>
</tr>
</tbody>
</table>

Results By Sample Cells

It was also possible to look at organizational structure measures at the individual sample cell level. The centralization measure averages for the sample cells are summarized in Table 14. The within-sample cell differences as seen in the standard deviations, were very
small. Again, the nursing departments were very similar to each other in the degree to which they were decentralized.

Table 14

**Centralization Results By Sample Cells**

<table>
<thead>
<tr>
<th>Beds</th>
<th>Metropolitan</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Profit</td>
<td>Non-profit</td>
</tr>
<tr>
<td>&lt;100 beds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mean</td>
<td>.05</td>
<td>.04</td>
</tr>
<tr>
<td>s.d.</td>
<td>.05</td>
<td>.04</td>
</tr>
<tr>
<td>100-199 beds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mean</td>
<td>.02</td>
<td>.01</td>
</tr>
<tr>
<td>s.d.</td>
<td>.01</td>
<td>.00</td>
</tr>
<tr>
<td>200-299 beds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mean</td>
<td>.01</td>
<td>.01</td>
</tr>
<tr>
<td>s.d.</td>
<td>.00</td>
<td>.01</td>
</tr>
<tr>
<td>300+ beds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mean</td>
<td>-</td>
<td>.01</td>
</tr>
<tr>
<td>s.d.</td>
<td>-</td>
<td>.00</td>
</tr>
</tbody>
</table>

The sample cell specialization results identified a trend of decreasing specialization as the number of beds increased. However, it must be noted that there appears to be a leveling off of the specialization scores in the two middle categories (100-300 beds). This may indicate that
there is some point that a full complement of jobs is reached and from that point on, more people are added by size rather than more jobs. The profit hospital nursing departments had a slightly higher degree of specialization when compared to the non-profit hospitals. The metropolitan non-profit hospital nursing departments had a slightly lower degree of specialization when compared to their rural counterparts. Table 15 summarizes these results.

Table 15

**Specialization Results By Sample Cells**

<table>
<thead>
<tr>
<th>Beds</th>
<th>Metropolitan Profit</th>
<th>Metropolitan Non-profit</th>
<th>Rural Profit</th>
<th>Rural Non-profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;100 beds</td>
<td>mean .60</td>
<td>.70</td>
<td>.80</td>
<td>.76</td>
</tr>
<tr>
<td></td>
<td>s.d. .06</td>
<td>.09</td>
<td>.07</td>
<td>.11</td>
</tr>
<tr>
<td>100-199 beds</td>
<td>mean .64</td>
<td>.59</td>
<td>.63</td>
<td>.67</td>
</tr>
<tr>
<td></td>
<td>s.d. .03</td>
<td>.04</td>
<td>-</td>
<td>.08</td>
</tr>
<tr>
<td>200-299 beds</td>
<td>mean .69</td>
<td>.59</td>
<td>-</td>
<td>.64</td>
</tr>
<tr>
<td></td>
<td>s.d. .18</td>
<td>.08</td>
<td>-</td>
<td>.07</td>
</tr>
<tr>
<td>300+ beds</td>
<td>mean -</td>
<td>.39</td>
<td>-</td>
<td>.50</td>
</tr>
<tr>
<td></td>
<td>s.d. -</td>
<td>.19</td>
<td>-</td>
<td>.15</td>
</tr>
</tbody>
</table>
Lastly, in examining the formalization results at the sample cell level, there was very little difference seen between the cells. Within-cell sample variances were small. The largest variance was seen in the rural hospitals with less than 100 beds. Table 16 summarizes these results.

Table 16

Formalization Results By Sample Cells

<table>
<thead>
<tr>
<th>Beds</th>
<th>Metropolitan Profit</th>
<th>Metropolitan Non-profit</th>
<th>Rural Profit</th>
<th>Rural Non-profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;100 beds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mean</td>
<td>8.42</td>
<td>8.25</td>
<td>8</td>
<td>7.90</td>
</tr>
<tr>
<td>s.d.</td>
<td>0.38</td>
<td>0.81</td>
<td>1.00</td>
<td>1.26</td>
</tr>
<tr>
<td>100-199 beds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mean</td>
<td>8.69</td>
<td>8.11</td>
<td>6.75</td>
<td>8.42</td>
</tr>
<tr>
<td>s.d.</td>
<td>0.38</td>
<td>0.83</td>
<td>-</td>
<td>0.45</td>
</tr>
<tr>
<td>200-299 beds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mean</td>
<td>8.88</td>
<td>7.81</td>
<td>-</td>
<td>8.9</td>
</tr>
<tr>
<td>s.d.</td>
<td>0.11</td>
<td>0.59</td>
<td>-</td>
<td>0.18</td>
</tr>
<tr>
<td>300+ beds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mean</td>
<td>-</td>
<td>8.33</td>
<td>-</td>
<td>8.75</td>
</tr>
<tr>
<td>s.d.</td>
<td>-</td>
<td>0.16</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

In summary, the nursing department organizational structures in this sample had a low level of
centralization. In other words, the low centralization results would indicate that nursing organizational structures in hospital settings were relatively flat.

The nursing departments were found to be organized in such a manner as to have a moderate degree of specialization. All the nursing departments showed a high degree of formalization. Nursing departments were found to depend on rules and regulations, policies and procedures, and/or job descriptions to control employee behavior to a high degree. The nature of the rules and regulations used in nursing and their control of nursing practice were not examined in this study.

The variances for the three structural measures were consistently low. This would indicate that the nursing departments, along the structural measures of centralization, specialization and formalization, were more similar than dissimilar in their organizational design.

Research Question # 3

Research Question # 3: What is the relationship between size (number of beds) and the structural measures of centralization, specialization and formalization for nursing departments in acute care hospitals?
The third research question identified the relationships between the nursing organizational structure, as measured by degree of centralization, specialization and formalization, and size. Correlations were done between number of beds and numbers of nursing staff and they were found to be correlated. Number of beds and managers were correlated at $r = .87 \ (p \leq .005)$, number of beds and caregivers were correlated at $r = .91 \ (p \leq .005)$ and number of beds and staff support were correlated at $r = .56 \ (p < .005)$. As was evident, the number of beds and numbers of employees were highly correlated. Because the number of employees was a redundant measure of size and the increased probability of error due to data manipulation, number of beds alone was used in statistical testing.

For the sample, the number of beds and centralization were found to have an inverse relationship in the moderate range with a correlation of $r = -.45 \ (p \leq .05)$. In other words, as the number of beds increased, the degree of structural centralization decreased. However, the strength of the relationship was moderate. Table 17 summarizes these results.
Table 17
Correlations Between Centralization, Specialization, Formalization and Number of Beds

<table>
<thead>
<tr>
<th></th>
<th>Centralization</th>
<th>Specialization</th>
<th>Formalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beds</td>
<td>-.45 (≤.05)</td>
<td>-.78 (≤.005)</td>
<td>.13 (n.s.)</td>
</tr>
</tbody>
</table>

The relationship between number of beds and specialization was inverse and strong. The results show a correlation of $r = -.78$ ($p ≤ .005$) between these variables. Indeed, degree of specialization can be described as an inverse function of number of beds. Therefore, as numbers of beds increased, there were fewer jobs with more people doing the same jobs in the nursing department.

The correlation between degree of formalization and size was positive but not significant. The formalization and number of beds correlation was $r = .13$. The nursing departments uniformly had a high degree of formalization, regardless of size.

In order to examine the relationships among the organizational structure variables, correlations were done between centralization, specialization, and formalization. The results show that specialization and centralization were correlated ($r = .43$, $p ≤ .05$) positively and of moderate
strength. In other words, the more centralized the nursing department, more specialization occurs. These two variables are not independent of each other. Both of these variables are related to counting numbers of employees in different ways. Centralization counted numbers of employees vertically whereas specialization counted numbers of employees horizontally within the organization. In the current study, formalization had a very weak, non-significant positive relationship with specialization (r=.15) and centralization (r=.16). The results are summarized in Table 18.

Table 18
Correlations Between Centralization, Specialization and Formalization

<table>
<thead>
<tr>
<th></th>
<th>Centralization</th>
<th>Specialization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialization</td>
<td>.43 (≤.05)</td>
<td></td>
</tr>
<tr>
<td>Formalization</td>
<td>.17</td>
<td>.15</td>
</tr>
</tbody>
</table>

In summary, size was found to have a relationship with the degree of centralization in the nursing department organizational structure. The nature of the relationship was inverse with moderate strength. Specialization had a strong inverse relationship with size. Formalization was found to be high regardless of size.
Research Question #4

Research Question #4: Is there a difference in the structural measures of centralization, specialization and formalization in nursing departments in acute care hospitals in different locations (metropolitan, rural)?

The fourth research question examined the relationship between hospital location and nursing organizational structure measures. In examining the relationship between hospital location and organizational measures, the nursing departments were sorted into two groups based on either their metropolitan or rural location. There were 48 rural and 50 metropolitan hospitals in the current study.

The results support the notion that the hospital location was related to the degree of centralization in the nursing organizational structures. The ANOVA test result was $F = 19.44$ with 96 degrees of freedom. With alpha at .05, the null hypothesis was rejected since the test score was greater than the critical value of 3.95 with $p < .005$. The ANOVA test result can be seen in Table 19. The rural nursing departments (mean = .05) were significantly more centralized than their metropolitan counterparts (mean = .02).
Table 19

**ANOVA Table For the Effect of Hospital Location on Centralization**

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>.02</td>
<td>1</td>
<td>19.44</td>
<td>&lt;.005</td>
</tr>
<tr>
<td>Within Groups</td>
<td>.11</td>
<td>96</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The hospital location was found to influence the degree of specialization in the nursing departments organizational structure. The ANOVA test result was $F = 36.86$ with 96 degrees of freedom. With alpha set at .05, the null hypothesis was rejected since the test score was greater than the critical value of 3.95 with $p < .005$. The rural nursing departments (mean = .73) were significantly more specialized than the metropolitan counterparts (mean = .55). Table 20 summarizes the test results.
Table 20

ANOVA Results for the Effect of Hospital Location on Specialization

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>.76</td>
<td>1</td>
<td>36.86</td>
<td>&lt;.005</td>
</tr>
<tr>
<td>Within Groups</td>
<td>1.98</td>
<td>96</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hospital location was found to have no effect on the degree of formalization in nursing departments in either rural or metropolitan locations. The ANOVA test result was F= .97 with 96 degrees of freedom. With an alpha of .05, the null hypothesis was maintained since the test score was less than the critical value of 3.95. Table 21 summarizes the test results.

Table 21

ANOVA Results for the Effect of Hospital Location on Formalization

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>.82</td>
<td>1</td>
<td>.97</td>
<td>n.s.</td>
</tr>
<tr>
<td>Within Groups</td>
<td>80.65</td>
<td>96</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
These results show that rural and metropolitan hospitals differ in their organizational structure in the degree of centralization and specialization. However, the hospital location had no effect on the degree of formalization.

These results contrast with the results of the first research question. In the results of the first question, the nursing directors ranked hospital location as having very little to no effect on the decision making of how to structure the nursing department. It would appear that rural and metropolitan nursing departments' were organized significantly different in the two measures, even though the directors did not perceive hospital location to be influential.

Further Exploration

Post hoc exploration was carried out to test the effect of location regardless of size on the centralization and specialization measures. The sample was not normally distributed by size which may have contributed to the location results discussed above.

Multiple regression analysis were carried out to identify the effect of location and size on centralization and specialization. The number of beds data was transformed using natural log resulting in normalization of data (Kolmogorov-Smirnoff = .0732, significance >.20). The
regression test showed that once the effect of size was controlled, location did not have a significant effect on centralization. In other words, the relationship between location and centralization was an artifact of number of beds. The scatterplot of the residuals indicate a relatively good fit (Durbin-Watson= 1.98) between the expected and actual residuals. These results are summarized below.

Table 22

Regression Results of Size and Location

Relationship with Centralization

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Beta</th>
<th>SE Beta</th>
<th>T</th>
<th>Sig T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centralization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Log/Beds</td>
<td>-.017</td>
<td>.003</td>
<td>-5.16</td>
<td>&lt;.005</td>
</tr>
<tr>
<td>Location</td>
<td>-.008</td>
<td>.007</td>
<td>-1.04</td>
<td>.30</td>
</tr>
</tbody>
</table>

R^2 = .35

F = 25.61 Significant F = <.005

The regression test of the relationship of number of beds and location on specialization indicated that location did influence specialization regardless of size. The nature of the relationship was inverse. Again, the natural log of the number of beds was utilized. The scatterplot of the residuals shows a good fit (Durbin-Watson= 1.68) between
the actual and expected residuals. These results are summarized below.

Table 23

**Regression Results of Size and Location and Specialization**

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Beta</th>
<th>SE Beta</th>
<th>T</th>
<th>Sig T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Log/beds</td>
<td>-.62</td>
<td>.01</td>
<td>-7.12</td>
<td>&lt;.005</td>
</tr>
<tr>
<td>Location</td>
<td>-.17</td>
<td>.03</td>
<td>-1.95</td>
<td>.05</td>
</tr>
</tbody>
</table>

\[ R^2 = .52 \]

\[ F = 53.33 \quad \text{Significant } F = <.005 \]

Research Question # 5

**Research Question # 5:** Is there a difference in the structural measures of centralization, specialization and formalization in nursing departments in the two types of financial basis (profit, non-profit) of hospitals?

Research question number five examined the effect of the hospital type, profit or non-profit, on the nursing organizational structure measures. The subjects were sorted by type of hospital. There were 13 profit and 84 non-profit hospitals in the study.
There was no effect of the hospital type seen on the degree of centralization in nursing departments. The ANOVA test result was $F = 0.36$ with 96 degrees of freedom. With alpha set at .05, the null hypothesis was not rejected because the test score was less than the critical value of 3.95. The following ANOVA table summarizes these results.

Table 24

ANOVA Results of the Effect of Hospital Type on Centralization

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>0.00</td>
<td>1</td>
<td>0.36</td>
<td>n.s.</td>
</tr>
<tr>
<td>Within Groups</td>
<td>0.13</td>
<td>96</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Specialization was also not influenced by the type of hospital in which the nursing departments existed. The ANOVA test resulted in an $F$ score of 1.59 with 96 degrees of freedom. An alpha of .05 was used and since the test score was less than the critical value of 3.95, the null hypothesis was not rejected. These results are summarized in Table 25.
Table 25

ANOVA Results of the Effect of Hospital Type on Specialization

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>.04</td>
<td>1</td>
<td>1.59</td>
<td>n.s.</td>
</tr>
<tr>
<td>Within Groups</td>
<td>2.70</td>
<td>96</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The type of hospital (profit and non-profit) had no effect on the degree of formalization in the nursing departments. The ANOVA test result was $F = .013$ with 96 degrees of freedom. Using an alpha of .05, the null hypothesis was not rejected since the test score was less than the critical value of 3.95. Table 26 summarizes these results.

Table 26

ANOVA Results on the Effect of Hospital Type on Formalization

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>.01</td>
<td>1</td>
<td>.013</td>
<td>n.s.</td>
</tr>
<tr>
<td>Within Groups</td>
<td>81.46</td>
<td>96</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Based on the results of the ANOVA tests, the nursing departments in profit and non-profit hospitals were found not to be significantly different in the organizational structure measures of centralization, specialization and formalization.

Research Question #6

Research question # 6: Is there a difference in the structural measures of centralization, specialization and formalization in nursing departments in acute care hospitals by quality of care as indicated by the RN/Patient ratio?

The last research question examined the relationship between quality of care, as indicated by the RN/patient ratio, and the nursing organizational structure measures of centralization, specialization and formalization. Regression tests were used to identify the percent of variance in the three structural measures due to differences in the RN/patient ratios.

As previously discussed, the RN/patient ratio were reduced to their decimal value based on Guilford's (1954) recommendation. Regression was used to test the relationship between the RN/patient ratios and the structural values. It was assumed in this study that, based on the degree of quality of care the nursing director
decides for the nursing department, the structure would be
designed so as to support that quality of care. Therefore,
different levels of care would be expected to relate to the
different degrees of centralization, specialization and
formalization.

The regression test between the RN/patient ratios
and centralization showed that very little variance,
$R^2=.0003$ ($F=.006$), was explained by the changes in the
RN/patient ratio. Transformations of the RN/patient data
were performed with minimal improvement in the fit of
residuals. The square root of the RN/patient ratio was the
best fit resulting in an $R^2=.003$ ($F=.33$). The Durbin-
Watson test result ($d=2.0$) indicated that there was no
apparent pattern of residual correlation. These two
variables were independent variables. It was concluded that
the RN/patient ratio had no relationship to centralization.

The regression test between RN/patient ratios and
specialization showed that very little variance, $R^2=.016$
($F=.49$), in specialization scores was explained by
differences in the RN/patient ratios. No data
transformations improved the result. The Durbin-Watson test
result ($d=1.4$), a positive serial correlation, indicating
that the adjacent residuals were similar. It was concluded
that the RN/patient ratios had no relationship to the
specialization results.
The regression test between the RN/patient ratios and formalization showed that very little variance ($R^2 = .0028$; $F = .27$) in formalization was explained by differences in the RN/patient ratios. The Durbin-Watson test ($d = 1.97$) indicated that there was no apparent pattern of residual correlation. No transformations of data improved the results. It was again concluded that the RN/patient ratios had no relationship to the degree of formalization seen in the nursing organizational structures.

In summary, the quality of care as indicated by the RN/patient ratio was found not to be useful in the prediction of the degrees of centralization, specialization and formalization found in the nursing organizational structures. It was concluded that the differences in the structural measures were not due to the differences in the quality of care provided by the nursing departments.
CHAPTER 5
Discussion

The Lawrence and Lorsch (1967) contingency theory proposes that organizations are influenced by the environment in which they exist. In other words, organizational structures are influenced by the organizational environment. This study utilized the notion of a relationship between the organizational environment and structure proposed by the Lawrence and Lorsch contingency theory (1967) to examine the nursing departments in acute care hospital settings. The research methodology utilized in the study was based on the methodology developed by the Aston Group (1968, 1969). The influence of specific variables identified from the literature on the decision making about structure was identified. The nursing department organizational structures were described using the structural measures of centralization, specialization, and formalization. The relationships between the nursing organizational environment and structure were examined. The environmental variables used in this study were hospital size, location and type. Hospital size was defined by number of beds, hospital location as either rural or metropolitan, and hospital type as either profit or non-profit. In addition, the relationship between one measure of quality of care,
RN/patient ratio, and the organizational structure was examined.

The study was an exploratory descriptive study that used a quantitative approach. In this manner, the organizational structures could be compared across a number of nursing departments in hospitals with different characteristics. Surveys were used to collect data from 98 nursing departments. The response rate was 15 percent. The hospitals were stratified by hospital size, location and profit status. Sample selection was done based on proportional sampling techniques, using random sampling at the sample cell level. There were 48 rural and 50 metropolitan hospitals in the sample and 13 profit and 85 non-profit hospitals. By number of beds, there were 44 hospitals with less than 100 beds, 23 between 100-199 beds, 13 between 200-299 beds, and 18 with 300 beds or more. Most of the respondents (n= 70) identified their hospitals as being teaching hospitals.

Most of the organizational research reviewed used a small sample, usually less than 60 organizations. No previous study of nursing departments across the United States using a large sample, 98 departments, stratified by hospital size, location and type has been reported in the literature. Because the large sample was representative of acute care hospitals in the United States, the results of
the study are generalizable to all nursing departments in acute care hospitals.

The study found that the nursing departments had low degrees of centralization, moderate degrees of specialization, and high degrees of formalization. Size was found to be related to the structural measures centralization and specialization. Location was found to be related to specialization. Formalization was found to be high and was not related to the hospital size, location or type (i.e., profit status). The type of hospital and the RN/patient ratio were found to be unrelated to centralization, specialization, and formalization. The hospital location was found to be unrelated to centralization and formalization.

Based on earlier research by Pugh et al. (1969), Leatt and Schneck (1982), and Routamaa (1985), the results of this study should have revealed a relationship between the selected environmental variables and the structural measures. However, no such relationship was found between the environmental variable hospital type and structure. No relationship was found between the environmental variable location and centralization and formalization. In addition, formalization for all nursing departments was uniformly high and unrelated to any environmental variables; and, the RN/patient ratio had no relationship with the structural
measures. Thus, contingency theory was not adequate in explaining all the results of this study.

What relationships support contingency theory?

Some relationships between the organizational environment and structure measure supported the Lawrence and Lorsch (1967) contingency theory. The notion of a relationship between aspects of the organizational environment and structure proposed by Lawrence and Lorsch contingency theory (1967) did serve to explain these relationships. Relationships were found between the environmental variable size and the structural measures of centralization and specialization. Hospital location was found to be related to specialization. Earlier researchers identified direct relationships between size and centralization (Pugh et al., 1969; Routamaa, 1985; Blau and Schoenherr, 1971). However, Anderson and Warkov (1965) found inverse relationships between administrative intensity and size (1961). The Anderson and Warkov (1965) findings were supported by the results from this study. The Anderson and Warkov (1965) research was done on hospitals. In discussing their results, Anderson and Warkov (1965) hypothesized that the difference in results from previous researchers who had found direct relationships between the research variables may have been due to the presence of large numbers of professional staff in the
organizations (hospitals). In the current study examining nursing departments, the staff was primarily professional and again the relationship between size and centralization was inverse.

It is hypothesized that the presence of professional staff in the organization contributed to the decreased need for centralization as size increased. Most likely, there is decreased need for supervision of professional staff. The specialization results indicate that there are more people doing the same job as size increases. These results support the notion that less supervision is needed as more people do the same work, in particular, professional staff.

Pugh et al. (1969), Blau and Schoenherr (1971), Gringer and Yasai-Ardekani (1981) and Routamaa (1985) found a positive relationship between size and specialization. In other words, the work to be done in organizations continued to be divided into smaller and smaller units (jobs) as size increased. The current results indicate the opposite occurs in nursing departments.

Leatt and Schneck (1982) found a weak inverse relationship between size and specialization in their research using nursing units. This study found a strong inverse relationship between size and specialization. These are major difference in the results from other organizational studies. Both the current study and that of Leatt and Schneck (1982) examined nursing organizations in

One explanation for the differences in results may be due to the different nature of the organizations studied. The personnel in manufacturing organizations most likely consisted of non-professional staff whereas nursing departments consist of large proportions of professional staff. Blau and Schoenherr (1971), based on research using a government social service industry, found that at some point in size the corresponding degree of specialization begins to slow down. Blau and Schoenherr (1971) identified a slowing down of the number of jobs created as size continued to increase. This trend was seen in the scatterplots where the outer end of the regression line became concave as size increased. The change in the regression line was interpreted to represent a point where the number of jobs did not continue to be created at the same pace as the size of the organization continued to increase.

Based on the above Blau and Schoenherr (1971) notion, it is hypothesized that as hospital size increases, nursing departments reach a point where there is a full complement of jobs within the department. Then, rather than the adding of more jobs, more personnel are simply added to existing jobs. The nursing professional allegiance would buffer
professional staff to the efforts of the organization towards further specialization with any continuing increase in size. The work to be done by nurses does not continue to be divided into smaller and smaller units as seen in other organizations. In other words, there is a limit to the amount of specialization or division of labor that can occur within nursing departments because of the professional nature of the work.

Routamaa (1985) found location influenced the structural measures of centralization and specialization. Leatt and Schneck (1982) found positive weak relationships between location and formalization and centralization. No relationships between location and centralization and formalization were found in the current study. However, Leatt and Schneck (1982) also found a negative relationship between location and specialization and the results of the current study supported the Leatt and Schneck (1982) finding. In this study, location was found to have a negative relationship with specialization regardless of size.

The rural and metropolitan nursing departments were found to be significantly different in number of jobs and the distribution of personnel in those jobs. One explanation for the differences in results between rural and metropolitan nursing departments may be tied to the availability of professional staff (RN). Where the
metropolitan hospitals may have a larger pool of professional staff to draw from, the rural nursing departments may not. In turn, the rural departments may use non-professional staff to fill positions. The jobs for the non-professional staff may then be more specialized than had they been filled by a professional who can provide a broad spectrum of patient care.

Another explanation for the result may be that the rural hospitals may not have access to large pools of specialized professional staff such as clinical specialist, enterostomal therapist, infection control, and/or surgical technicians so that if there is a specialized position, there may be one person in that job. In turn, metropolitan nursing departments may create specialist positions utilizing several persons in the jobs. Therefore, specialization would be higher in the rural nursing departments reflecting the adaptation of the departments to the environment in which they exist.

Pugh et al. (1969) identified the relationship between strategic choice and structure. Ford and Hegarty (1984) proposed that managers' perceptions of organizational characteristics serve as a filter on decision making about the organizational structure. In turn, misperceptions could lead to inappropriate decision making regarding the structure implemented.
Nursing directors perceived size as influencing decision making, supporting the relationship found between size and structure. Ford and Hegarty (1984) found the same result in their study of managers perception of size as an influence on decision making. Nursing directors perceived location as having little or no influence on decision making and yet location was found to be related to specialization. The effect of this misperception of location remains unknown. Type of hospital was perceived to have little influence and indeed it was found not to have a relationship with any of the structural measures.

Nursing directors perceived the variable hospital type (profit, non-profit) to have little to no influence in the decision making about organizational structure. This finding supported the absence of any relationship found between type of hospital and structural variables. However, Routamaa (1985) had found positive relationships of moderate strength between ownership and formalization and specialization. The relationship between ownership and centralization was positive though very weak. Pugh et al. (1969) found that ownership was not related to the structural variables as did the current study.

The nursing directors perceived the influence of variables internal to the nursing department in design decisions such as philosophy of nursing, nursing department purpose, and patient assignment pattern, rather than the
variables external to the nursing department such as hospital location. The variables extracted from the descriptive nursing literature identifying nursing philosophy, purpose and patient assignment pattern were empirically supported by the results of this study.

Many other variables were identified in descriptive data that had not previously been identified. The shortage of professional nurses and money was identified in the descriptive data of recent restructuring and in research question number one. Other hospital environmental aspects perceived by the nursing directors as influencing the decision making were hospital management styles, hospital strategic direction and quality of support services. These variables were not included in this research.

Why did the data not support contingency theory?

No relationships were found between the type of hospital and structure or between location and centralization and formalization and between size and formalization. There are several possible explanations for the lack of support for the Lawrence and Lorsch (1967) contingency theory. One explanation for the lack of support may be related to the differences in the operationalization of variables. Lawrence and Lorsch (1967) defined those environmental aspects relevant to their research rather than all aspects of the environment. Researchers have
studied organizations attempting to identify other aspects of organizational environment that influence structure. Location and type (i.e., profit status) were identified by Routamaa (1985), Anderson and Neuhauser (1972), and Saathoff and Kurtz (1962) as influencing organizational structure. Leatt and Schneck (1980) utilized these same variables when examining nursing units relationships with the hospital environment. Sampling methods in the reviewed literature are questionable and operationalization of variables varied from author to author. This methodological problem makes the results of the reviewed research questionable. Although this study used environmental aspects identified in previous research, the differences in results may be due to the different operationalization of variables and the quality of the reported research.

A second explanation for the lack of support for the contingency theory may be the environmental variables defined in this study, which may not be the environmental variables that influence the nursing department structure. There may be other environmental variables that influence the nursing organizational structure that research has not yet identified. Several environmental variables were identified in the descriptive data of this research. These included the financial climate, shortage of qualified staff, hospital administration, hospital strategic direction, quality of support services, preferences of
nursing director, work load, and outside regulatory agencies. One example, is the financial climate in the health care industry at the time of data collection. Because of recent changes in the hospital reimbursement methods, the health care industry is in a state of uncertainty (Curtain, 1984). Thus nursing directors have smaller budgets and have reported the elimination of middle management positions due to budget cuts. This can be described as the effect of the environment (i.e., financial cutbacks) on the nursing organizational structures. Another variable identified in the descriptive data influencing the design decisions was the shortage of professional staff. Because of the nursing shortage at the time of the study, the organizational structure may have been designed differently. However, these environmental variables were not part of this study.

A third explanation for the lack of support may be that contingency theory evolved out of the study of manufacturing organizations rather than service organizations. This could lead to lack of support because of fundamental differences between the two types of organizations. For example, as seen in the descriptive data, in nursing practice organizations almost 60% of the caregiving staff consisted of professional nurses. The work force in most of the manufacturing organizations examined in the literature most likely did not include large
proportions of highly trained professional staff. In turn, the nursing organizational structures may have evolved to support the large number of professional staff at the patient care level regardless of certain aspects of the organizational environment in which they existed, supporting the notion of professional identity buffering the effect of organizational demands.

A fourth possible explanation for the lack of support for the contingency theory may be related to the level of analysis in the research. It must be noted that earlier researchers such as Pugh et al (1968, 1969) and Routamaa (1985) examined the total organization rather than the subunits of the organization. Blau and Schoenherr (1971) studied the total organization as well as the subunits (local offices) of the federal government social service agency. Leatt and Schneck (1982) studied subunits of departments of nursing within the context of the hospital. The current study examined a subunit, nursing department, of the total organization (hospital) rather than the total organization. These differences in level of analysis may serve to explain the differences in results.

No relationship was found between the RN/patient ratio and the structural measures. A relationship between these variables was expected. This study assumed that nursing directors decided the quality of care to be provided by the nursing department and structured the
nursing department in such a manner as to support that quality of care. Should this assumption be found false, the relationships between quality of care and structure would not be expected. One possible explanation for the result may be that the quality of care measure, the RN/patient ratio, may not have been adequate as a measure of quality of care. Had another measure of quality of care been used, a relationship might have been found.

Formalization remained high regardless of any of the environmental variables. Ford and Hegarty (1984) identified that managers believed professionals to be in need of less formalization than non-professional staff. However, based on this result nursing is dependent on high levels of formalization. Other researchers (Pugh et al, 1969; Routamaa, 1985; Blau and Schoenherr, 1971; and Leatt and Schneck, 1982) found formalization to be related positively to size. Routamaa (1985) found formalization to be related to location as well. However, this study found formalization to be unrelated to any of the identified environmental variables. This result may have been affected by forces outside the nursing department, even outside the hospital. For example, the expectations of accrediting bodies such as Joint Commission of Accreditation of Health Organizations (JCAHO) may have impacted directly on this structural measure. Because reimbursement for health care is dependent upon the hospital accreditation by this
agency, requirements that they may have for nursing departments policies and procedures may simply override the influence of other variables such as size and location. Other industries such as manufacturing simply may not have this kind of factor in their operations so that formalization is not connected to payment in these other industries. Thus this factor may help explain the differences in results between this study and other studies.

All nursing departments in the study were found to have very similar organizational structures as seen in the standard deviations for the structural measures. They all had low degrees of centralization, moderate degrees of specialization, and high degrees of formalization. These results supported the notion proposed by Harrison et al (1988) that organizations of like nature would structure in a similar manner. In turn, the very narrow distributions may have influenced the relationships between the organizational environment variables and structure measures studied. Had there been more differences between the nursing departments in each of the measures, it may have been possible to identify relationships between organizational structure and environment.
Intercorrelations of structural variables.

Pugh et al. (1968) found a correlation of −.53 between centralization and specialization in their research. This result was interpreted to mean that as the organization utilized less centralization of authority, more specialization of jobs and personnel was utilized. However, in nursing, the results indicated that the opposite holds true. As centralization increased, so would the degree of specialization. Or vice versa, with less centralization of authority, less specialization was apparent.

One possible explanation may be the high number of professional staff in nursing departments. The presence of highly trained professional staff may influence the need for centralization and specialization in practice organizations. The proportion of professional staff to total staff in nursing departments may provide some indication of the relationship between centralization and specialization.

Another possible explanation for the differences in results may be the sample selection. Hospital size was not normally distributed because of the proportional stratification of the sample. The smaller hospitals were found to have the higher degrees of centralization and the higher degrees of specialization. It may be that size may
have influenced the nature of the correlation between centralization and specialization.

Formalization was found to have a weakly positive correlation with centralization and specialization. Pugh et al. (1968) found a strong positive correlation between formalization and specialization. Pugh et al. (1968) hypothesized that organizations with a high degree of specialization would utilize more procedures to regulate activities of employees. This notion appears to hold true in nursing departments. However, Pugh et al. (1968) found a weak inverse relationship between formalization and centralization. This finding was supported in the Gringer and Yasai-Ardekani (1971) replication. Pugh et al (1968) proposed that control of employees through the use of rules and regulations would increase as the centralization of authority decreased. The opposite was found in this study most likely due to the high degree of formalization across all variables.

Serendipity Finding

A serendipity finding of this study was the identification of the fact that 17% of the nursing directors did not know or have access to the nursing department budget. This study assumed that nursing directors had knowledge and control of their nursing budget in order to make management decisions.
Conclusions

The Lawrence and Lorsch contingency theory (1967) did not serve to explain all the results of this study. No relationship was found between specific aspects of the nursing organizational environment, hospital location and type, and the structural measures of centralization, specialization and formalization. The RN/patient ratio was found not to be related to the organizational structure. However, there was indication of a relationship between location and specialization and between size and centralization and specialization.

Limitation

There were some limitations in this study. The study did not include specialty (i.e., psychiatric), military and/or government hospitals. Research including these hospitals may result in different findings.

There was limited means of ensuring validity and reliability of instruments. The use of single observations did not allow for such testing. However, where possible, testing was done. For example, hospital number of beds, type and location were found to have 100% reliability. The instruments were found to have construct and content validity. However, the instruments were borrowed from organizational research and adapted to fit the nursing
field. These factors may have influenced the research results.

Data collection was done by means of a mail survey using the directors of nursing/designe as the data source. The self selection strategy may have built in response bias. Data collection could have been done by subject interviews with nursing directors and/or administrative personnel along with on-site observation of the nursing departments. The findings might have been different had a different research methodology been implemented.

The response rate was 15%, lower than the standard 35% in research. Because it was 15%, it suggest inadequacy of response and generalizability. However, the response rate achieved the necessary response rate for the study population. Confidence can be had in generalizing the results.

Further Research

In this time of major health care change, it is imperative that nursing administration research continue to focus on the department of nursing. The nursing department structures continue to need examination so that nursing is better able to provide the organizational components required to meet nursing department goals, satisfy its members, and increase professionalization within the larger hospital context.
In further examination of nursing department organizations, research can be geared to a more specific investigation of the centralization and specialization measures. These were the two measures found to be related to the nursing organizational environment. It was proposed that the high number of professional staff may explain the results. Empirical research needs to be carried to test this notion. The comparison of professional and non-professional organizations may serve to examine this notion.

There may be other environmental variables that impact on these structural measures and the results of this study point to the need for further exploration of each of these measures.

The relationship between the organizational structure and environment needs further exploration. One possible environmental variable that needs further research is the effect of the financial climate on the nursing department structure. Using the Lawrence and Lorsch (1967) definition of environment along the aspect of uncertainty, the relationship between financial climate and structure could be explored. Descriptive data from this study identified this variable as influencing the structural decision making in nursing departments. Further research would serve to validate this finding.
Additional research examining the quality of care and structure interaction needs to be done. Another measure of quality of care or even a variety of measures of quality of care might identify a relationship between quality of care and structure. For example, using a measure such as the ratio of professional staff (RN) to total staff based on Full Time Equivalents (FTE's) staffing as a quality of care measure. Another approach could be the use of multivariate statistics incorporating several measures of quality of care. In this way, a relationship between quality of care and structure may be identified.

The high degree of formalization needs further investigation as does the nature of the rules and regulations utilized by nursing departments. A descriptive study of the policies and procedures for nursing departments could be done in which the types of rules and regulations (i.e., management, patient care) could be identified. The role each of these sets of rules and regulations has in the management of the nursing department could then be explored.

The metropolitan and rural nursing departments were found to be structured significantly different in degree of specialization. Further research is needed to understand these differences as well as to identify other possible differences. A body of management literature that addresses
the issues and concerns of the rural nursing departments needs to be built.

Lastly, nursing directors' lack of knowledge and access to the nursing department budget needs exploration. For example, descriptive data could serve to validate this finding. In turn, further exploration could serve to identify the fiscal knowledge needed and used by nursing directors. The reasons for nursing directors lack of access to and control of the budget could be explored by data collection from nursing directors, hospital CEO's and hospital comptrollers.
APPENDICES
Appendix A

Scoring for Instruments

I. Structural Measures

A. Centralization
(From Samuel and Mannheim, 1970)

\[ C = \frac{J - J_{\min}}{J_{\max} - J_{\min}} \]

\[ = \frac{J - (n-1)}{\frac{n(n-1)}{2} - (n-1)} \]

\[ 0 < C < 1 \quad \text{and} \quad n > 1 \]

C = structural control index from organizational chart of sample department of nursing

\[ J = \sum_j \] cumulative sum of the number of subordinates at all levels

j = number of subordinates reporting to the ith member of the decision unit

n = total number of participants in the decision unit

Example

```
   1-8
  / \
 /   /
2   3-11
     /   /
4   6-15
     /   /
5   7-16
```

\[ j_1 = 19 \]
\[ j_2 = 6 \]
\[ j_3 = 1 \]
\[ j_4 = 9 \]
\[ j_5 = 4 \]
\[ j_6 \text{ thru } j_8 = 0 \]

\[ J = 39 \]
\[ J_{\max} = \frac{n(n-1)}{2} = \frac{20(19)}{2} = 190 \]
\[ J_{\min} = n-1 = 19 \]

\[ C = \frac{39 - 19}{190 - 19} = \frac{20}{171} = .1169 = .117 \text{ or low centralization} \]

instrument continued
B. **Specialization**  
(From Samuel and Mannheim, 1970)  
\[ F = -\frac{1}{\ln(m)} \sum_{n} \frac{\ln (n_i)}{n} \]  

F = functional diversification index  

m = number of distinct jobs within the department of nursing; i.e., on one unit there are 1 head nurse, 1 assistant head nurse, 3 advanced clinical nurses, 15 clinical nurses, 5 staff nurses II, 4 staff nurses I, and 2 unit secretaries. These are 7 distinct jobs. The totals for the department of nursing are then added up to get the value of 'm'.  

n = total number of employees in all jobs; i.e., using the above example, n = 31  

n_i = number of employees in the ith job  

\ln = natural logarithm  

Example  

m = 15  

n_1 = 150 \quad n_6 = 1 \quad n_{11} = 1  

n_2 = 15 \quad n_7 = 7 \quad n_{12} = 1  

n_3 = 3 \quad n_8 = 4 \quad n_{13} = 2 \quad n = 200  

n_4 = 5 \quad n_9 = 3 \quad n_{14} = 4  

n_5 = 2 \quad n_{10} = 1 \quad n_{15} = 1  

\[ F = -\frac{1}{\ln(m)} \sum_{n} \frac{\ln (n_i)}{n} = -\frac{1}{2.70805} (.96853) = .3575 \]  

Specialization Index = .3575 or low specialization  

C. **Formalization**  
[Adapted by Sathe' (1974) from Inkson et al (1970)]  

**Score**  

1. Organizational chart given to  
   no one \hspace{1cm} 0.00  
   head of unit only \hspace{1cm} 0.25  
   head of unit plus one other supervisory personnel \hspace{1cm} 0.50  
   head of unit plus most or all other supervisory employees \hspace{1cm} 0.75  
   all employees \hspace{1cm} 1.00
continued

2. Percentage of non-supervisory employees given written operating instructions
   
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<th>Range</th>
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<tr>
<td>0 - 20%</td>
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<td>41 - 60%</td>
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<td>61 - 80%</td>
<td>0.75</td>
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<td>81 - 100%</td>
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3. Written job descriptions are given to
   
<table>
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<th>Head of Work Unit</th>
<th>Percentage</th>
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<tr>
<td>Supervisory Employees</td>
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<tr>
<td>Non-supervisory Employees</td>
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4. Manual of procedures available
   1.00

5. Written statements of policies available
   1.00

6. Written workflow schedule available
   1.00

7. Percent of employees turning in a written report to their supervisors on a regular basis (ie. evaluative reports)
   
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<td>81 - 100%</td>
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II. Organizational Size

1. The mean number of beds utilized in the past calendar year was

2. The percent bed occupancy rate in the past calendar year was

3. The number of people responsible for management (ie. head nurse and up) of the department of nursing during the past calendar year was

4. The number of people responsible for direct caregiving in the department of nursing during the past calendar year was

5. The number of people responsible for staff support (ie. clinical nurse specialist, secretaries, staff development, quality assurance) in the department of nursing during the past calendar year was
continued
6. The average RN/patient ratio for the past calendar year was

7. The department of nursing personnel budget (including benefits) for the past calendar year was

8. The average number of RN shifts per week was

III. Organizational Context

1. The type of hospital (as designated in its' charter) in which the department of nursing exists is
   for profit
   not-for-profit

2. The location of the hospital can best be described as
   metropolitan
   non-metropolitan

3. The hospital in which the department of nursing exists is considered a
   teaching hospital
   non-teaching hospital

IV. Variables Perceived to Influence Structure

The following variables are perceived to influence design decisions (use Likert scale)

size of hospital
location of hospital
type of hospital
nursing department purpose
philosophy of nursing
method of patient care  ie primary nursing
Nursing Organizational Structures in Hospital Settings:

Designs for Practice

Dissertation Research

This study examines the organizational structure of acute care hospital nursing departments. Please answer all the questions. Should you wish to comment on any questions or qualify your answers, please do so in the margins. Your comments will be read and taken into account.

Thank you for your help.

Miriam Stokes Zwitter
F.P.B. School of Nursing
Case Western Reserve University
Organizational Chart

I am interested in learning the reporting relationships in departments of nursing. Please draw the organizational chart of the whole nursing department as it is presently organized.

Record the numbers of personnel reporting to each position throughout the department. If you prefer, attach your current organizational chart as long as all revisions and numbers of personnel are included. If extra paper is needed, use the back of the page.
Functional Areas

Please indicate the various areas of specialization (i.e., medical nursing, surgical nursing, pediatric nursing) within the department of nursing. Record the number of personnel by job title for each functional area. Add functional areas and positions as necessary.

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<tr>
<th>Name of Functional Area</th>
<th>Number of Employees</th>
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| **Clericals** |  
| **Aides/Techs** |  
| **Other** | (please identify) |

8. ___________________________ Director/s ________  
Supervisors __________  
Head Nurses __________  
Asst Head Nurses ______  
Clinical Specialist ___  
Staff Nurses __________  
LPNs _________________  
Clericals ____________  
Aides/Techs __________  
Other ________________  
(please identify)

9. ___________________________ Director/s ________  
Supervisors __________  
Head Nurses __________  
Asst Head Nurses ______  
Clinical Specialist ___  
Staff Nurses __________  
LPNs _________________  
Clericals ____________  
Aides/Techs __________  
Other ________________  
(please identify)

10. __________________________ Director/s ________  
Supervisors __________  
Head Nurses __________  
Asst Head Nurses ______  
Clinical Specialist ___  
Staff Nurses __________  
LPNs _________________  
Clericals ____________  
Aides/Techs __________  
Other ________________  
(please identify)

Other Nursing Personnel Not Identified Above:  
**Title/ Functional Area**  
**Number of Personnel**

Total number of employees including yourself ______________
The questions below consider whether documents are available irrespective of whether they are used or not. A document is at minimum a single piece of paper with printed or typed content—not handwritten.

1. Who is given a copy of the organizational chart? (check one)
   ______ no one
   ______ head of the department only
   ______ head of the department plus one other supervisory employee
   ______ head of the department plus most or all the supervisory employees
   ______ all employees in the department

2. What percent of non-supervisory employees are given written operating instructions such as job description, job contracts, job assignments? (check one)
   ______ 0 - 20%
   ______ 21 - 40%
   ______ 41 - 60%
   ______ 61 - 80%
   ______ 81 - 100%

3. Are written terms of reference or job descriptions given to the following? (circle your answer)
   head of the department
     yes  no
   supervisory employees
     yes  no
   non-supervisory employees
     yes  no

4. Is a manual of procedures available? (circle your answer)
   yes  no

5. Is a written statement of policies available? (circle your answer)
   yes  no

6. Is a written work or job assignment schedule available? (circle your answer)
   yes  no

7. What percent of employees in your department turn in a written report (ie self evaluations, peer reviews, unit evaluation, quality assurance reports) to their supervisor on a regular basis? (check one)
   ______ 0 - 20%
   ______ 21 - 40%
   ______ 41 - 60%
   ______ 61 - 80%
   ______ 81 - 100%
Organizational Size

The following questions pertain to the size of the department of nursing for January through December (calendar year) 1988.

1. What was the mean number of beds utilized?

2. What was the percent bed occupancy?

3. What was the number of people responsible for management of the department of nursing (ie head nurse and above)?

4. What was the number of people responsible for direct caregiving in the department of nursing?

5. What was the number of people responsible for providing staff support (ie clinical nurse specialists, secretaries, Quality Assurance, Staff Development) in the department of nursing?

6. The average RN/patient ratio (ie. 1RN/xxpatients) for the department of nursing for January through December, 1988 was

7. The average number of RN shifts per week (other than summer and holidays) for January through December, 1988 was

8. The personnel cost, including benefits, for the department of nursing for January through December, 1988 was

\$  \hspace{1cm} \text{(can be rounded off)}


\hspace{1cm} yes \hspace{1cm} no

10. On the average, what percent of the budgeted nursing positions remained vacant during 1988?
Organizational Context

The questions below pertain both to the hospital milieu in which the department of nursing operates and to the milieu of the nursing department.

1. What is the type of hospital, according to its' charter, in which the department of nursing exists? (check one)
   ___ for-profit
   ___ not-for-profit
   ___ other (please describe)

2. What is the location of the hospital in which the department of nursing exists? (check one)
   ___ metropolitan
   ___ non-metropolitan
   ___ other (please identify)

3. What is the teaching status of the hospital in which the department of nursing exists? (check one)
   ___ teaching
   ___ non-teaching

Demographic Data

1. How long have you been in your present position? (check one)
   ___ less than 2 years   ___ 10 - 13 years
   ___ 2 - 5 years        ___ more than 14 years
   ___ 6 - 9 years

2. How long have you been employed at the present hospital?
   ----------------------

3. When was the last time a major change was implemented in the structure of the nursing department? Describe briefly what lead to the changes and what were those changes.

4. Who makes the decisions to restructure the department of nursing? (check one or more as appropriate)
   ___ hospital chief executive
   ___ senior hospital administrative staff
   ___ nursing department head
   ___ senior nursing administrative staff
   ___ consultants
   ___ others (please identify)
continued

5. Using the following scale, to what extent are each of the following factors **important** in influencing how to organize the department of nursing? Add additional factors that you identify as important in influencing design decisions.

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<th>2</th>
<th>3</th>
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<tr>
<td>Little or no extent</td>
<td>Slight extent</td>
<td>Moderate extent</td>
<td>A large extent</td>
<td>A very great extent</td>
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</table>

___ size of hospital
___ location of hospital
___ type of hospital
___ philosophy of nursing
___ purpose of the department of nursing (goals)
___ method of providing patient care (ie. primary, team, functional, other)

Other factors:

----
----
----

The source for the above personnel and organizational information was (check one or more and add as needed)

- personal knowledge
- computer systems
- paper records
- other

THANK YOU FOR PARTICIPATING IN THIS RESEARCH!
In order to maximize the data collection process, I am requesting that the name and phone number of a contact person at your institution be provided. You are not required to provide the requested information but it will facilitate the research process, should clarification of information be needed. Upon completion of data collection, this identifying information will be destroyed.

Should questions arise about the clarity of the data provided, may I contact someone?

   ___ yes       ___ no

If yes, whom may I contact?

Name ___________________________

Phone number  (   ) __________________
Appendix B

Consent Form

I am presently a Ph.D. candidate at the F. P. B. School of Nursing at Case Western Reserve University. Your cooperation is requested for a survey being conducted to examine how departments of nursing are organized. The survey may be completed by you or your designee. This data will be used in partial fulfillment of dissertation requirements.

There are no right or wrong answers because different jobs may require different organization. It takes approximately thirty to forty minutes to complete the questionnaire.

No institutional identification is placed on the questionnaire. Your name and the name of your institution will not be identified as having participated in this study.

Consent to participate will be indicated by the return of the questionnaire in the enclosed pre-addressed envelope. Should you have any questions, please feel free to contact me at (312) 724-3748. Should you have comments, please use the margins of the questionnaire.

Please answer all the questions on the pages that follow. Thank you for your time and effort in this project.

Miriam Stokes Zwitter
Ph.D. Candidate FPB School of Nursing
Case Western Reserve University
Appendix C

Postcard

You were recently selected to participate in a research study titled NURSING ORGANIZATIONAL STRUCTURES IN HOSPITAL SETTINGS: Designs for Practice. A survey was mailed to you for data collection. It is crucial to the study that you complete and return the survey. If you have done so, THANK YOU !!! If you have not returned the survey yet, please do. Should you need another survey, please contact me at 312-724-3748. Thank you for participating in this nursing research.

Miriam Stokes Zwitter RN
Case Western Reserve University
Appendix D
Reliability Pretest Results

Structural Variables

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<th>formalization</th>
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Hospital Context

metropolitan, not for profit teaching hospital

Demographic

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<th>5</th>
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<td>reorg.</td>
<td>-</td>
<td>closed</td>
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<tr>
<td>in organization</td>
<td>dept.</td>
<td>-</td>
<td>units</td>
<td>posit.</td>
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who makes decision senior nsg dept senior nsg hosp nsg
to reorganize nsg head adm staff CEO head

Priority of Variables Perceived to Influence Decisions in Reorganizing

| size of hospital | 5 | 3 | 4 | 2 | 4 | 3 | 4 |
| location | 2 | 3 | 3 | 2 | 1 | 4 | 3 |
| type | 5 | 4 | 4 | 1 | 3 | 5 | 4 |
| philosophy of nursing | 5 | 5 | 4 | 4 | 4 | 5 | 5 |
| method of pt assignment | 5 | 5 | 4 | 3 | 4 | 5 | 4 |
| other | 5 | staff sophistication | 5 | manager skill | 5 | teaching status | 5 | finances |
References


