MANAGEMENT AND SUPERVISORY CONTROL: CONTEXTUAL ANTECEDENTS AND CONSEQUENCES FOR PERFORMANCE, SATISFACTION, AND COMMITMENT

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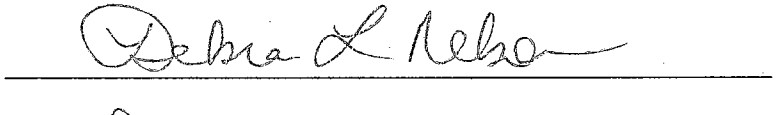

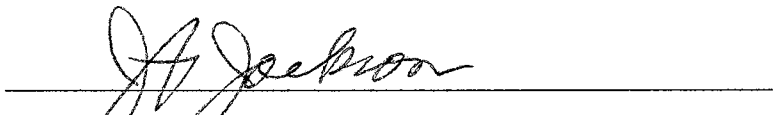

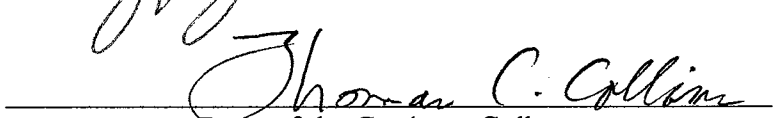

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TABLE OF CONTENTS

Chapter Page

Chapter Page

Chapter Page

LIST OF TABLES

Table Page

Table Page

Table Page

Table Page

LIST OF FIGURES

CHAPTER I

THE PROBLEM

Management control is an important construct in the management literature. The importance of management control is related to the central roles it plays in the areas of management principles, strategic management, and organization theory. Control is widely viewed as one of the five basic functions of management: planning, organizing, staffing, directing, and controlling (Fayol, 1949). Control is also considered to be one of the three phases of the strategic management process: formulation, implementation, and evaluation/control. In addition, management control is a widely-recognized construct in organization theory, taking its place alongside size, strategy, structure, technology, and environment as an important organization theory variable. Because of the importance of management control to these areas, any increase in the understanding of the management control construct should have widespread beneficial effects.

Control is also an important concept in other fields, such as accounting, finance, and engineering. The purpose of control in these fields is similar to management control; each seeks to ensure a specified level of performance. Management control differs, however, in that it is the performance of people that is being controlled, rather than the performance of finances or physical processes. The focus of this study is management control.

The management control function seeks to ensure that an organization or organizational unit achieves its objectives or in strategic control, that the organization effectively implements formulated and emergent strategies while responding to

environmental and competitive changes. Because the management control process attempts to ensure the accomplishment of important organizational or departmental goals, it is an area of importance to practitioners. Management control may be emerging as an especially significant topic given current workplace trends such as the use of self-managed work teams and tele-commuting, which appear to require management control methods different from the typical bureaucratic forms of management control. Thus control is a compelling topic, of interest to both organizational theorists and practitioners.

Despite being a crucial area of organizational science, management control has been less researched and understood than the other management functions and many other organizational theory constructs, such as structure (Eisenhardt, 1985). In 1958, the management control function was described as "one of the most neglected and least understood areas of management activity" (Dauten, Gammill, & Robinson, 1958). In 1960, the management control literature was described as "one of the thorniest areas of management today" (Rathe, 1960: 30). In 1967, Mockler noted that "in spite of the fact that management control is one of the basic management functions, there is no comprehensive body of management control theory and principles..." (Mockler, 1967: 80). Eleven years later, Hofstede referred to "the poverty of management control philosophy" (Hofstede, 1978: 450). Management control theory remains somewhat ignored and enigmatic today despite significant theoretical advances during the past few decades (Das, 1989; Eisenhardt, 1985).

There are several possible reasons for the relative neglect of management control in the literature. One possibility is simply semantics--the word "control" is largely perceived in a negative sense. Individuals may often equate control with manipulation; and since bureaucratic controls are the most common management control system option in many companies, the manipulative elements of control are among those most often observed. As Nelson and Machin (1976: 287) stated:

> One often detects a reaction to the idea of control as involving constraint on individual managers, which is then condemned as being contrary to the spirit of currently evolving social values and to notions of self-realization and management motivation.

Thus the negative connotations of the term "control" may be partially responsible for the sparse attention to this area.

A second reason for the lack of definitive research in the management control area is the frequent confusion between the structure and management control constructs. Structure has been widely studied in the organization theory literature, while management control has received far less attention. Ouchi and Maguire (1975) empirically verified that structure and management control are separate constructs. Structure refers to the grouping of individuals and departments within an organization, including formal reporting relationships, levels of hierarchy, span of control, and coordination and integration systems (Daft, 1989). Key variables used to describe structure are differentiation, formalization, and centralization (Ouchi, 1977). Management control, however, refers to the mechanisms used by an organization to ensure the accomplishment of its objectives (Ouchi, 1979). Some researchers, however, fail to clearly differentiate between control structure and structure (e.g., Zeffane, 1989), and much of the literature on structure purports to have been studying various aspects of management control. As a result, a great amount of attention has been given to the relationships between context factors and structure, but little attention has been given to the relationships between context factors and management control. Because of the similarities and confusion between structure and management control, and because of the importance of management control as a construct in its own right, a direct examination of the relationships between context factors and management control is necessary.

Researchers also may have avoided the study of management control systems due to the lack of and conflicts among established frameworks and measurement

instruments in the field. Management control is not a simple area to study, and most research in this area has been exploratory (e.g., Ouchi & Maguire, 1977; Ouchi, 1977; Eisenhardt, 1985). Management control should be a major factor in organizational design. Current management control frameworks, however, offer little useful assistance. Current theory is either too general and simplistic for specific applications, or has insufficient empirical evidence to support its validity.

Organization theorists share some areas of agreement concerning management control. First, the other management functions precede control in the logical sequence of activities, since controlling presupposes the existence of organizational objectives and systems (although management control systems may be established simultaneously with objective-setting in the planning process). Control provides feedback to the other management functions and to the goal-setting process. Second, without appropriate management control, the planning function becomes meaningless. It makes little sense to set objectives without having some means to ensure their accomplishment. These general conclusions concerning the importance of the management control process, however, do not greatly enhance the understanding of how to manage and implement the control process. One important goal of this research project is to improve the understanding of the management control process and its application to organizations by investigating context factors and structure as antecedents of bureaucratic and cultural management control systems at the department level, and by examining the relationship of the congruence of these antecedents and control systems and the outcome variables of job satisfaction, organizational commitment, and department performance.

Definitions of Management Control

Because the term "control" has been used in a wide variety of settings, it is necessary to distinguish among these meanings, and to define the meaning of the term

"control" within this research project. This section reviews and analyzes several different ways to define and categorize management control, and specifies the meaning of the control construct in this research.

Management control can be defined as "the mechanisms through which an organization can be managed so that it moves toward its objectives" (Ouchi, 1979: 833). Organizations require management control; without control, organizational members may not act in ways leading to goal accomplishment (Robey, 1991). Early research often characterized control as a three-step cybernetic process of setting standards, monitoring performance, and taking any necessary corrective action (Giglioni & Bedeian, 1974). More recent research focuses on the latter two steps, relegating the setting of standards to the planning function. Most definitions of control, however, are consistent with the above definition. An alternative construct was suggested by Tannenbaum (1968), who defined control as the total interpersonal influence within an organization. Tannenbaum's definition emphasizes the political aspects of the control process.

There are several ways to organize or categorize information relating to the management control construct. Three of these are explained below: (1) types of control used at various organizational levels; (2) cybernetic versus homeostatic control; and (3) control methods of interest to researchers in various disciplines.

One way to categorize management control is by the type of control exercised at different levels of analysis. At the strategic business unit (SBU) level of analysis, the emphasis is on strategic control. A strategic control system supports managers in "assessing the relevance of the organization's strategy to its progress in the accomplishment of its goals" (Lorange, Morton & Ghoshal, 1986: 10), and tends to focus on long-term performance over a five-to-ten year horizon. Strategic control concentrates on ensuring that the organization accomplishes its strategic objectives. At the departmental level of analysis, the emphasis is on managerial control systems.

Managerial controls focus on regulating the behavior of and ensuring goal accomplishment within departmental units. At the individual level of analysis, supervisory controls focus on the performance of individuals (Daft, 1989). This research examines both managerial control systems and supervisory control methods. Throughout this research, the term "managerial control systems" (MCS) refers to the primary mode of control at the departmental level, while the term "supervisory control methods" (SCM) refers to the primary mode of control used by supervisors to monitor and evaluate the performance and goal accomplishment of individual workers. Occasionally these terms are shortened to "control systems" and "control methods." Strategic controls are beyond the scope of this research.

A second way to categorize management control is as cybernetic versus homeostatic (Hofstede, 1978). The cybernetic model assumes that the information flows necessary for measuring and correcting performance are readily available to managers. Where these information flows are not readily available or easy to obtain, homeostatic control may be used. Homeostatic control is a self-regulating mechanism in which individuals or organizational units behave like living cells, regulating their own behavior (Hofstede, 1978). This research considers both cybernetic and homeostatic controls, but does not focus on this method of categorization.

A categorization of management control based on the primary interests and disciplinary focus of management researchers provides a useful method of grouping the vast and disparate literature concerning management control. Three areas emerge from this categorization: information systems, sociology, or human relations. Researchers in accounting and management information systems often study management control from an information systems approach, with an emphasis on the information flows required in the control process. Researchers in organizational behavior usually follow the human relations approach, with an emphasis on the consequences of management control systems and methods. Researchers in

organizational theory and sociology tend to follow the sociological approach, with an emphasis on the antecedents and determinants of management control systems and methods. The literature review in the next chapter makes use of this system of categorizing the management control literature.

Purpose of the Study

This research has two major objectives. The first is to develop a comprehensive model of management control, with a focus on the antecedents and consequences of management control systems. The second is to test a significant portion of the newly-developed model. The following section explains the rationale for choosing these two objectives for this study.

As mentioned earlier, control is the least understood of the management functions, yet the control function is extremely important to managers in that it seeks to ensure goal accomplishment. Management control is therefore of interest to both practitioners and theoreticians. A more comprehensive model of management control—one which examines the antecedents and consequences of management control system choices—is needed. A greater understanding of the management control process may allow managers to ensure a higher degree of goal accomplishment without jeopardizing other important areas such as the job satisfaction and organizational commitment of their employees. In addition, the management control literature has several weaknesses that the development of such a model seeks to overcome. First, many of the management control models have received little empirical testing (e.g., Hofstede, 1978; Ouchi, 1977, 1980). Second, the majority of empirical studies of the management control process have had a relatively narrow focus (e.g., Ouchi & Maguire, 1975; Ouchi, 1977; Eisenhardt, 1985). The sample for these empirical studies included only retail department stores, thereby limiting their generalizability to other populations. Third, models with a narrow domain have been

the focus of empirical studies; no study has examined a comprehensive management control model. Fourth, where authors have studied similar models, they have often focused on different aspects. The different methods of studying the different segments have made integration of results difficult.

The model developed for this study overcomes some, but not all, of these limitations. A single industry is still used for the sample, but rather than examining retail department stores, hospitals are the sample for this study. Examining hospitals adds another industry to the empirical base while also providing a sample with a greater variety of employee and task characteristics than retail department stores. In addition, the management control model examined in this study has a larger focus than those used in earlier studies, in that it includes context factors, structure, management control systems, task characteristics, supervisory control methods, and three outcome variables. In addition, in that the management control model subsumes several earlier models, it facilitates integration of the results, although several industry-specific measures still complicate direct comparisons.

Many organizational theory researchers have adopted the term "contextual dimensions" (also referred to as context elements or factors) to refer to elements in the organization's setting that influence its internal characteristics (Pugh, Hickson, Hinings, & Turner, 1969; Daft, 1989). Context elements usually include the variables of size, environment, technology, ownership, dependence, and resources, among others. These are typically contrasted with structural dimensions such as formalization, centralization, and complexity, which focus on an organization's internal characteristics. It is within the environment of these context factors that structural and management control choices occur (Hickson, Pugh, & Pheysey, 1969).

In a model developed for teaching purposes, Daft (1989) examined the relationships between the context factors of size, technology, and environment, along with structural factors, and organizational control systems. Daft's (1989) model

attempts to synthesize much of the literature on management control and its structural and contextual determinants. Because of its intuitive appeal, his model becomes an interesting point of departure for this research. It should be noted that while Daft's model is intuitively appealing and pedagogically useful, it has not been empirically tested.

The second purpose of this research is to test a significant portion of the newly-developed comprehensive model of management control. The empirical portion of this research focuses on the contextual and structural antecedents of the two most common management control systems: bureaucratic and cultural control. The research also examines the relationships among management control systems, supervisory control methods, and the important outcome variables of job satisfaction, organizational commitment, and department performance. Since previous studies have tested some of the relationships between individual factors and control choices, the additional relationships tested in this study will allow a greater understanding of the control process than has previously been available.

In addition to its theoretical contributions, this study has the potential to be of benefit to practitioners. By learning more about the relationships of contextual and structural factors and management control systems, the results of this study may help provide managers with information concerning how to make management control system choices consistent with the structure and context of their departments, and to increase important department and organizational outcomes. This study should also provide insights into controlling employees in varying contexts and settings within an organization. This may help practitioners accommodate differing groups of employees within an organization, while simultaneously ensuring departmental and organizational goal accomplishment.

Overview of the Dissertation

Chapter 1 provided an introduction to the management control function and to the scope and purpose of this research project. Chapter 2 reviews the management control theory literature. This chapter presents an analysis of existing frameworks and develops an integrated framework for management control system choices, and contains a review of the appropriate literature related to various job outcomes. These bodies of literature provide a conceptual foundation for the comprehensive management control model presented in chapter 2, which in turn provides the basis for the hypotheses of the study. Chapter 3 outlines the research methodology, including a description of the sample, the research design, the development of the test instruments, and other appropriate issues. In addition, specific literature related to the sample under study is presented. Chapter 4 reports the findings of the study. Finally, chapter 5 summarizes the results of the study, discusses the implications and limitations of the findings, and provides suggestions for future research.

CHAPTER II

REVIEW OF THE LITERATURE

This chapter presents a theoretical basis for the delineation of a model of management control systems and methods and their relationship to structure and the context factors of size, technology, and environment. The first section of the chapter reviews the management control literature, thereby providing a theoretical foundation for the development of the management control model. The review of the management control literature begins with an overview of the early development of management control theory, followed by a summary of three recent approaches to studying management control: the information systems approach, the human relations approach, and the sociological approach. This review gives special attention to recent advances in understanding management control theory, and to the most common management control models.

The remainder of the chapter builds and develops the management control model by reviewing the organization theory literature concerning context factors and structure. As each context factor is presented, hypotheses relating it to management control systems are given. Following this, the comprehensive management control model is explained, along with hypotheses for the relationships among management control systems and supervisory control methods. The chapter concludes with an explanation of the congruence of the model and hypotheses concerning outcome variables.

Approaches to Management Control Research

The early literature on management control focused on the steps in the management control process and on the cybernetic nature of control. After the foundation for management control theory was developed, further investigation appears to have split into three approaches, based on the disciplinary focus of the researchers. Researchers in accounting and management information systems normally study management control from an information systems approach, with an emphasis on the information and data flows used as measures in the management control process. Researchers in organizational behavior usually follow the human relations approach, with an emphasis on the consequences of management control systems and methods. Researchers in organizational theory and sociology tend to follow the sociological approach, with an emphasis on the antecedents and determinants of management control systems and methods. The following sections present these three approaches, paying special attention to the sociological approach, which provides many of the theoretical underpinnings of the management control model used in this research.

Early Management Control Literature

The most recent large-scale review of the management control theory literature covered the period of 1900-1972 (Giglioni & Bedeian, 1974). Giglioni and Bedeian attempted to show that, despite the slow development in the management control theory area, there was sufficient information available to assist managers in implementing management control in organizations. Giglioni and Bedeian noted that the basic concept of management control was first delineated in the early twentieth century, and that the first set of management control principles was specified by Urwick (1928). Urwick's five management control principles were: (1) the principle of responsibility, (2) the principle of evidence, (3) the principle of uniformity, (4) the principle of comparison, and (5) the principle of utility (Urwick, 1928).

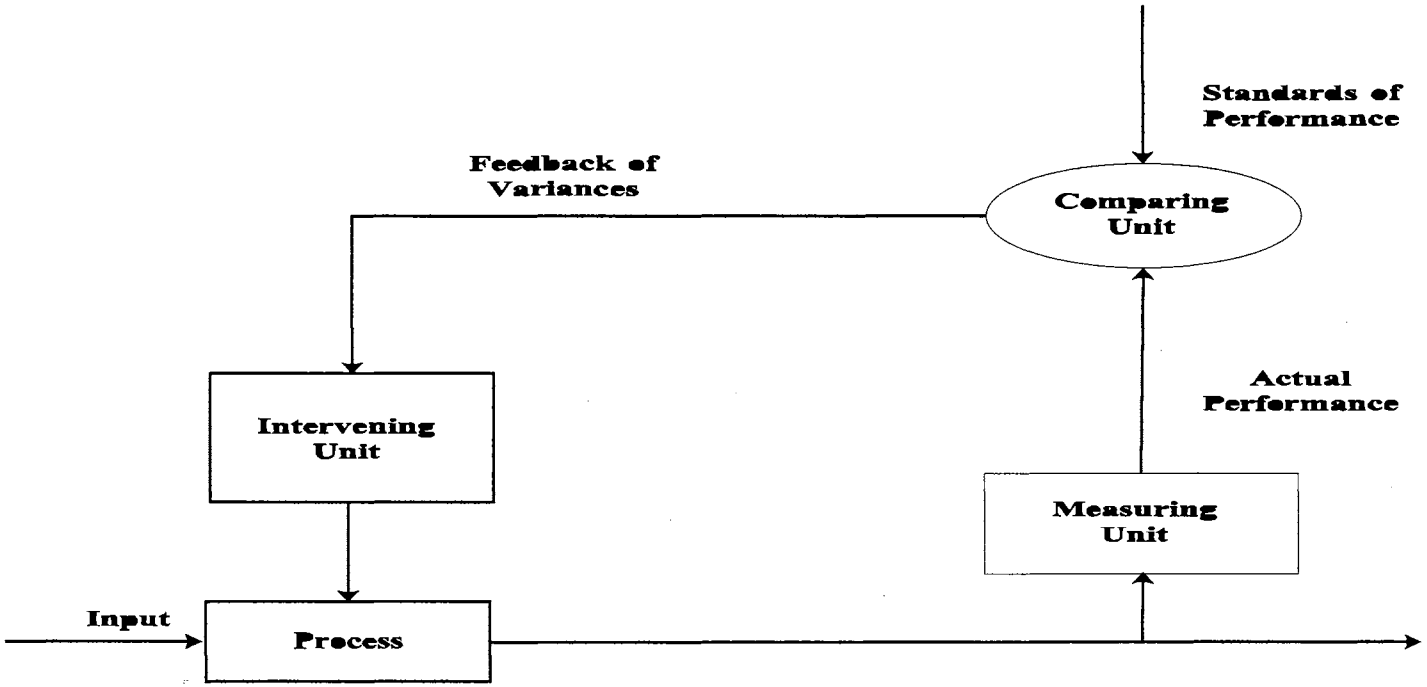
The next major formulation of management control principles was not published until 1958 (Koontz, 1958), and contained eighteen principles of planning and control. Included in these were four basic principles of control: (1) the principle of strategic point control, (2) the principle of organizational suitability, (3) the principle of future controls, and (4) the principle of direct control. The 1950's and 1960's saw the beginnings of the development of a science of management control theory and control models. Inevitably, these models were mechanistic and cybernetic in nature. Giglioni and Bedeian concluded that:

> Even though control theory has not achieved the level of sophistication of some other management functions, it has developed to a point that affords the executive ample opportunity to maintain the operations of his firm under check. Unquestionably, however, continued interest and research in this area are necessary to bring control theory to new levels of sophistication and, above all, pragmatism (1974: 301).

The Information Systems Approach

Researchers in accounting and management information systems often view control from an information systems approach. This approach focuses on the process of control, and on the information flows necessary to monitor and correct deviations from planned performance. The content of this research is similar to earlier work on control in its mechanistic and cybernetic nature, but this area has developed in sophistication along with developments in information systems technology.

According to Hofstede (1978), "cybernetic" refers to a process that involves setting goals, measuring results, comparing results and goals, providing the process under control with feedback on undesirable variances, and correcting deviations (Figure 1). By this definition, most of the literature surveyed by Giglioni and Bedeian (1974) should be labeled as "cybernetic". Research from an information systems focus primarily attempts to increase the effectiveness of cybernetic-based management control systems. Reimann and Negandhi (1974), for example, showed that



Adapted from Hofstede, G. (1978). The poverty of management control philosophy. *Academy of Management Review*, 3, 450-461.

Figure 1. Cybernetic Control Model

organizational control methods are more effective when formalized procedures are used to control both human and material resources in a balanced fashion, rather than emphasizing one or the other. Sihler (1978) demonstrated the importance of the management-by-exception principle in designing management control systems, and the importance of timely feedback in the efficiency of control systems. The management-by-exception principle submits that managers do not need to spend time reviewing performance that is within normal ranges; managerial attention is required only when performance varies beyond a certain amount.

Hofstede (1978) observes that cybernetic control models are based on three assumptions that frequently are unrealistic in organizational situations: (1) a standard for goal accomplishment exists, (2) the process that the organization wants to control is measurable, and (3) it is possible to use information on performance deviations to eliminate undesirable outcomes. These assumptions are valid when dealing with machines, and may have some validity when dealing with highly structured industrial organizations (such as assembly-line manufacturing), but are less valid in most organizational situations (for example, in a research laboratory or a mental health counseling center). Many of the processes in organizations either are not easily measured, or the information is not available in a form useful for correcting deviations expeditiously. In these situations, cybernetic control models cannot satisfy management control requirements. The continued use of a cybernetic control model when its assumptions are not met leads to pseudo-control—a "state of affairs in which a system is under control on paper...but not in reality" (Hofstede, 1978: 453). In these situations, management control can be accomplished either within the work group—a self-regulating or homeostatic unit—or through political processes, where decisions are based on judgment, negotiation, and power; and where control is largely determined through selection of personnel and assignment of responsibilities. In these situations, the focus of study shifts from the information flows to concerns for the individual or

the work group—the foci of the human relations and sociological approaches, respectively.

The Human Relations Approach

Researchers in organizational behavior and psychology often view management control from a human relations approach. The primary concerns of this approach are the motivation and control of individual performance, and the consequences of the use or design of management control systems and methods. For example, using data collected from interviews of 787 senior British managers in 78 firms, Child (1973a) found that using structured activities to accomplish management control led to higher levels of interpersonal conflict, and that centralization of authority led to higher levels of conformity. Kerr and Slocum (1981) used an expectancy theory framework to demonstrate that managers can motivate employees to accomplish organizational objectives. The thesis of their literature review was that "the creation and distribution of incentives—whether intrinsic or extrinsic—and the dissemination of information about these incentives are considered critical to controlling the performances of people in organizations" (Kerr & Slocum, 1981: 117). Kerr and Slocum reviewed several methods for ensuring management control, including familiar organizational processes such as role clarification, goal setting, leader initiation of structure, feedback, consideration, stroking, and the administration of rewards and punishments.

For example, Kerr and Slocum (1981) contend that role specification is an important form of management control, but that it is often very difficult to specify organizational roles unambiguously. As a result, managers use motivational tools such as goal setting and leader initiation of structure in the role clarification and role-making process. Feedback then provides employees with information concerning performance, which facilitates management control. When these methods of role clarification and feedback are used in conjunction with each other, the ability of employees to perform

increases, and their desire to perform also often increases. The resulting level of motivation raises the likelihood of successful goal accomplishment, which is the focus of the management control process.

Kerr and Slocum (1981) also reviewed how several substitutes for direct managerial oversight can be used in controlling performance. When both task predictability and workflow predictability are high, for example, the tasks themselves provide control over performance (Slocum & Sims, 1980). Another substitute for managerial oversight is professional orientation. Professionals are socialized to perform with high standards without the need for centralized controls (Miller, Glick, Wang, & Huber, 1991; Saxberg & Slocum, 1968). Professional expertise may reduce the need for task-related information, and professional standards may reduce the willingness for a professional to be controlled by the organization (Kerr & Slocum, 1981). For professionals, bureaucratic controls may conflict with their professional standards, which originate outside the organization (Abernethy & Stoelwinder, 1991; Miller, 1967). Work groups may also serve as internal substitutes for managerial oversight, performing the tasks of role clarification and feedback (Kerr & Slocum, 1981; Kerr & Jermier, 1978).

A common interest of researchers in the human relations school is the relationship of management control processes to job satisfaction. For example, Anderson and O'Reilly (1981) found that the three traditional components of management control—goal-setting, measurement, and corrective action—as administered through performance evaluations, were positively related to performance, but not to satisfaction. Specifically, difficult goals, top management support for the performance appraisal system, and high-quality feedback were associated with increased managerial performance. Snavely (1987), in a study of hospital staff nurses, found that more bureaucratic methods of control were positively related to job satisfaction as well as to effective performance correction. Her findings imply that

bureaucratic control methods may be superior to other methods of management control in terms of both satisfaction and performance, at least in some types of organizations or with certain groups of individuals.

The human relations approach, therefore, offers several insights for management control theory. First, it appears that highly-structured management controls may increase conflict. Second, rewards and feedback, especially if used with role clarification or specification through the planning function, may help facilitate effective management control. Third, it is possible for individuals or groups to exercise some form of self-control. Finally, the relationship between management control and job satisfaction appears to be modified by situational characteristics.

The Sociological Approach

The sociological approach centers on group norms, and the effects that management control systems have at the group and individual level. It focuses on the antecedents and determinants of management control systems and methods. Many of the recent advances in management control theory, including those of Ouchi and his colleagues, have emanated from this perspective. This section uses a chronological approach to examine these contributions to management control theory.

Ouchi's Supervisory Control Framework

The development of the Ouchi framework began with a study of department store managers and employees. Questionnaires were answered by 2,398 department store employees in 197 departments in five stores, including 329 managers (Ouchi & Maguire, 1975). Ouchi and Maguire differentiated between two bureaucratic types of supervisory control: behavior control and output control. Behavior control seeks to ensure desired outcomes by regulating worker behaviors, while output control regulates performance by measuring outputs. Contrary to Blau (1956), who asserted

that behavioral and output controls were substitutable, Ouchi and Maguire (1975) proposed that these control methods are not interchangeable, but serve two different functions. They found that the use of behavior control increases as a manager's knowledge of means-ends relationships increases, and the use of output control increases as a manager's need to provide legitimate evidence of performance increases. Their results indicated that output controls and behavior controls are independent, and thus are not substitutes. In addition, Ouchi and Maguire found that the use of output control increased, and the use of behavioral control decreased, at higher levels of the organization. The perceptions of employees as to the extent they were controlled were also related to hierarchical level, with employees at lower levels of the organization perceiving that they were more controlled than those at higher levels. Hierarchical level, however, was strongly intercorrelated with task complexity. Because of this correlation, it is impossible to determine without further study which of these two variables is the more important factor affecting control.

In a second study, Ouchi (1977) used a sample of 78 department stores drawn from the Ouchi and Maguire (1975) sample of 197 stores. One informant per store filled out a self-report questionnaire. In this study, Ouchi examined the appropriate conditions for the use of either output control or behavior control (Ouchi, 1977). He proposed that to use behavior control, there must be an understanding of (or at least an agreement about) means-ends relationships. Output control required reliable, valid, and accepted output measures. A third type of control, "ritual control," existed where there was neither an understanding of means-ends relationships nor the availability of acceptable output measures. Ritual control is based on the concept of individual employees and groups of employees enforcing organizational norms. Ritual control depends on the worker to agree with and act in accordance with the established norms of the organization, a process that relies heavily on the selection process and socialization into the norms of the organization (Snell, 1992). Ritual control has been

referred to by several names in the literature: ex ante control (Flamholtz, 1979), input control (Snell, 1992; Jaeger & Baliga, 1985), and socialization control (Govindarajan & Fisher, 1990). Some researchers have treated ritual control as a subset of behavior control (e.g. Govindarajan & Fisher, 1990). The variety of terms and frameworks used for this construct indicates weak construct definition (Snell, 1992). Figure 2 shows the resulting framework for control systems. Note that either behavior control or output control is predicted when the availability of output measures is high and the knowledge of the transformation process is also high. While either is possible, it is not likely that both will be used, since organizations rarely can afford the expense of monitoring redundant control signals (Govindarajan & Fisher, 1990).

Ouchi found that the completeness of output measures was related to organizational structure. The structural variables of vertical and horizontal differentiation were related to increased completeness of output measures, while increased task homogeneity was related to less complete output measures. Ouchi (1977) speculated that increased differentiation led to the need for output measures that could be compared across units. Formalization was not related to output control. The completeness of output measures was positively related to the use of output control. Ouchi (1977) also found evidence to support the contention that an increased knowledge of the transformation process results in a decreased reliance upon output control.

Ouchi's Management Control Framework

The focus of Ouchi's management control research then shifted from supervisory control methods to managerial control systems. As mentioned in Chapter One, supervisory controls operate at the individual level, while managerial controls

	Knowledge of the Transformation Process	
Availability of Output Measures	**Perfect**	**Imperfect**
High	Behavior Control/ Output Control	Output Control
Low	Behavior Control	Ritual Control

Ouchi, W.G. (1977). The relationship between organizational structure and organizational control. *Administrative Science Quarterly*, 22, 95-113.

Figure 2. Control Type and its Antecedent Conditions

operate at the organizational work unit or departmental level. Ouchi (1979) theorized that an organization has three basic mechanisms through which it can control its workers: markets, bureaucracies, and clans. According to this theory, which Ouchi did not subject to empirical testing, markets achieve control primarily through the price mechanism, assuming that prices carry the necessary information for effective control. Market control is efficient if the markets are frictionless. If not, market control must be supplemented, usually with bureaucratic control, to be effective.

Bureaucracies rely on rules, rather than prices, to provide the basis of management control. Rules are only partial bundles of information providing arbitrary standards to be used for comparisons, while prices are complete bundles of information which imply that a comparison has already been made. Thus prices are more efficient than rules in an informational sense; however, frequently a frictionless price mechanism is not available, and, thereby, bureaucratic control emerges. At the supervisory control level, both behavior controls and output controls are considered to be bureaucratic control methods.

Clans rely on socialization to produce employees who internally monitor performance, thereby reducing the need for external standards of performance. In highly-socialized groups, workers will monitor their own and each other's behavior, using social pressures to ensure conformity to the performance standards of the group. In clan control, shared values help to create a cohesive organization out of diverse groups and individuals (Kunda, 1992; Tjosvold, 1986; Wilkins & Ouchi, 1983). In such organizations, the culture is a management control mechanism through which organizational members influence the behavior of its members (Kunda, 1992).

Ouchi (1979) theorized that social and informational prerequisites determine the choice of a management control mechanism (see Table 1). The information requirements are least stringent for clan control, and most stringent for market control; while the social requirements are least stringent for market control and most stringent

TABLE 1

PREREQUISITES FOR CONTROL SYSTEM CHOICE

Social and Informational Prerequisites

Control System Option	Social Requirements	Information Needs
Market	Norm of Reciprocity	Prices
Bureaucracy	Norm of Reciprocity Legitimate Authority	Rules
Clan	Norm of Reciprocity Legitimate Authority Common Values & Beliefs	Traditions

Adapted from Ouchi, W.G. (1979). A conceptual framework for the design of organizational control mechanisms. *Management Science*, 25 (9), 833-848.

Prerequisites using a Market Failures Framework

Control System Option	Tolerance of Evaluation Ambiguity	Tolerance of Goal Incongruence
Market	Little	High
Bureaucracy	Moderate	Moderate
Clan	High	Low

Ouchi, W.G. (1980). Markets, bureaucracies, and clans. *Administrative Science Quarterly*, 25, 129-141.

for clan control. Market control requires complete information in the form of frictionless prices. The information needs of clan control are less stringent; all that is required are traditions, which convey only partial information.

On the other hand, the market control mechanism requires the least stringent social requirements. Market control requires only a norm of reciprocity, i.e., "fair play". The bureaucracy requires the respect of and cooperation with legitimate authority, while the clan also requires shared beliefs and values. Thus the social requirements are most stringent for the clan, and least stringent for the market.

Ouchi summarizes the implications of the social and informational prerequisites of the control mechanisms with this analogy:

> If the price requirements of a Market cannot be met and if the social conditions of the Clan are impossible to achieve, then the Bureaucratic mechanism becomes the preferred method of control. In a sense, the Market is like the trout and the Clan like the salmon, each a beautiful, highly-specialized species which requires uncommon conditions for its survival. In comparison, the bureaucratic method of control is the catfish—clumsy, ugly, but able to live in the widest possible range of environments and, ultimately, the dominant species (Ouchi, 1979: 840).

Ouchi theorized that pure markets, bureaucracies, or clans are never observed; real organizations will contain elements of each. Organization design is therefore contingent upon the social and informational characteristics of each organizational or departmental work unit, and the costs to the organization of the various management control mechanisms.

Ouchi's Market Failures Framework

After theorizing that the above variables—information and social requirements—determine the choice of management control systems, Ouchi (1980) used a market failures framework (Williamson, 1975) to propose an additional set of variables to explain management control system choice. In this framework, the ability

to measure individual performance accurately and the extent of employer-employee goal congruence relate to the choice of management control system. Market control is possible where there is little ambiguity over performance, and where high levels of goal incongruence are tolerable. Where moderate amounts of ambiguity over performance or goal congruence exist, bureaucratic control mechanisms predominate. Where goal congruence is high, higher levels of performance evaluation ambiguity can be tolerated. With high goal congruence, workers presumably will pursue the goals of the organization, and thus the requirement for unambiguous performance evaluation is lessened; this is equated with the clan form of control. These relationships are summarized in Table 1. In terms of tolerance of ambiguity, market control is the most limited, while clan control can tolerate high levels of ambiguity. In terms of goal incongruence, the price mechanism of market control allows for high goal incongruence, while clans can tolerate only low levels of goal incongruence. Das (1989) used these two dimensions to develop a contingency framework, as shown in Table 2. His framework emphasizes the default nature of bureaucratic control systems. The market and clan systems operate only in the extremes; the bureaucratic system tends to be in evidence in all other combinations. In the table, all capital letters are used to designate where markets, bureaucracies, and clans are most appropriate, while small letters indicate where the default condition of bureaucratic control exists. Das' (1989) assertion that bureaucratic control is the default system is echoed by Hecksher (1994), who suggests that bureaucratic systems are self-perpetuating because of the positional power held by individuals in bureaucracies, and that concerted effort is necessary to overcome the bureaucratic default.

Eisenhardt's Agency Theory Framework

Eisenhardt (1985) adopted a framework similar to Ouchi's, but proposed that an agency cost perspective could add explanatory power to the model. Eisenhardt studied

TABLE 2

CONTINGENCY FRAMEWORK FOR MANAGERIAL CONTROL SYSTEMS

	Goal Incongruence		
Performance Ambiguity	**High**	**Moderate**	**Low**
High		Bureaucracy	CLAN
Medium	Bureaucracy	BUREAUCRACY	Bureaucracy
Low	MARKET	Bureaucracy	

All caps = strongest form

Das, T.K. (1989). Organizational control: An evolutionary perspective. *Journal of Management Studies*, 26 (5), 459-475.

specialty retailers in a large shopping center, in contrast to Ouchi, who studied salespersons and managers in large department stores (Ouchi & Maguire, 1975; Ouchi, 1977). Eisenhardt hypothesized that the costs of measuring outputs were as significant as the ability to measure them in the choice of behavior versus output control. Because agency theory assumes divergent preferences between owners and workers, the role of management control is to structure measures and rewards so the organization's best interests will be served through individuals pursuing their own best interests. The agency theory assumption of divergent preferences runs counter to Ouchi's (1979, 1980) concept of clan control, which assumes employer-worker goal congruence. In addition, agency theory adds a risk-bearing issue to management control. In organizations facing more uncertainty, output-based controls shift risk to the employees. The agency theory perspective also emphasizes the role of rewards in the control process. Rather than task characteristics being the primary determinant of the information available for control purposes, information is assumed to be a purchasable commodity, and thus behavior control is feasible even when the knowledge of the transformation process is imperfect. Based on the agency theory perspective, "principals will employ outcome control only when the cost of measuring behavior exceeds the cost of transferring risk to their agents" (Govindarajan & Fisher, 1990: 262).

Eisenhardt (1985), in a study of 54 retail stores, used discriminant analysis to show that task programmability was the most important predictor of the choice between behavior and output control; i.e., the nature of the selling task was most related to the form of compensation used. Behavior measures and cost of outcome measures were also significantly related to compensation mode. Thus, where employees received more supervision, salaries were more likely to be the mode of compensation. Smaller stores, for which the costs of output measures (commissions) were more expensive, were also more likely to use salaried compensation. Contrary to

Ouchi and Maguire (1975), Eisenhardt found behavior and output controls to be substitutes for each other.

Eisenhardt (1985) suggested that while an emphasis on task characteristics as determinants of the control method is more powerful than competing agency theory explanations, adding an emphasis on agency costs increases the power of the model. Her study, however, suffers from several shortcomings. One is the equating of salaries with behavioral control and commissions with output control. While there is a connection, this unidimensional representation of management control methods fails to explain the monitoring and evaluation process accurately. Another shortcoming is the narrow focus of the study, since neither market control nor clan control was included in the design.

Cultural Control Literature

Several other terms have been used somewhat interchangeably with the term "clan control." Baliga and Jaeger (1984) used the term "cultural control," Child (1973a) used the term "personal control," Edström and Galbraith (1977) applied the term "control by socialization," and Barley and Kunda (1992) used the term "normative" control for this concept. In this research, the term "cultural control" is used to include these other terms. Kerr and Jackofsky (1989) provide a good summary of cultural control in their description of the "clan culture":

> The clan culture rests on a reciprocal long-term commitment between the individual and the organization. There is close identification and interdependence among peers, and organization members adhere to a broad range of behavioral and attitudinal norms. These values and norms are passed down to younger managers from older ones who serve as role-models. In this culture, cooperation and conformity are more likely to be valued than aggressiveness and entrepreneurship (Kerr & Jackofsky, 1989: 166).

Cultural control systems differ from bureaucratic control systems in several important ways. The selection process is more important, since workers must identify with the culture and goals of the organization (Kunda, 1992; Posner, Kouzes, & Schmidt, 1985). This identification with the organization is often the result of both selection and job factors (Kunda, 1992; Wiener, 1988; Schneider, Hall, & Nygren, 1971). Education may be used as a screening device to select workers with values congruent with those of the organization (Cohen & Pfeffer, 1986).

Cultural control has a different focus than bureaucratic control. Bureaucratic control is external, and is largely motivated by external rewards; cultural control is internalized (Ray, 1986). Bureaucratic control relies on manipulation of rewards to produce loyalty, which results in increased productivity; cultural control relies on myth and ritual to produce identification with the firm, with resulting high productivity (Kunda, 1992; Ray, 1986). Contrasting assumptions about human nature are also implied: bureaucratic control views workers as rational and competitive; cultural control views workers as "emotional, symbol-loving, and needing to belong to a superior entity or collectivity" (Ray, 1986: 295). Barley and Kunda (1992) argue that cultural control and bureaucratic control represent another wave in a long, alternating cycle between rational and normative ideologies of management. These different management control methods tend to provide "opposing solutions to the problem of control: normative control and regimes of trust versus rational control and regimes of self-interest" (Barley & Kunda, 1992: 386).

Training and socialization are also more important in cultural control systems. Effective socialization results in the internalization of desired values, making constant surveillance of workers less necessary (Kunda, 1992; Pfeffer, 1981). Monitoring is accomplished through interpersonal interaction, and feedback takes on a more subtle nature. Rather than transmitting control information in the form of rules and regulations, it is conveyed through stories, myths, sentiments, beliefs, and attitudes

(Pfeffer, 1981). These become "mechanisms through which certain organizational members influence how other members are to think and feel—what they want, what they fear, what they should regard as proper and possible, and, ultimately, perhaps, who they are" (Kunda, 1992: 93).

Cultural control rests heavily on both objective and subjective interdependence. For cultural control to be successful, this interdependence must be viewed positively by organizational members. According to Tjosvold (1986), positive interdependence exists in situations where individuals have common projects and joint responsibilities, and are rewarded as a group. Where positive interdependence exists, organizational members normally perceive that their goals are positively linked, and that coordination with other members is beneficial. As a result, mutually beneficial approaches to division of labor, resource usage, conflict resolution, and communication develop. Eventually, organizational members develop a sense of common vision and shared values (Tjosvold, 1986).

Kunda's (1992) ethnographic study of a high-technology firm that purposefully manages its culture as a mechanism of management control reinforces several of the characteristics of cultural control mentioned above. Kunda observed that:

> Traditional forms of control associated with bureaucracy are relegated to a supporting role. Instead, control is thought of as the internalization of discipline reflected in the attitudes, orientations, and emotions of committed members. The company is presented as informal and flexible, and its management as demanding yet trusting. The community is characterized as "bottom-up," loose, free, a "people company." In this view, members are not constrained by enforced or traditional structures and the explicit behavioral rules associated with them. On the contrary, they are expected to engage in a form of creative chaos where decisions emerge through a political process of negotiation between innovative members. Discipline is not based on explicit supervision and reward, but rather on peer pressure and, more crucially, internalized standards for performance. There is little mention of the economic structure, and the importance of economic rewards is underplayed, even frowned upon. It is a fact of life, but not one to be emphasized; instead,

> rewards are seen as arising from the experience of communion, of belonging, of participation in the community as organizationally defined (Kunda, 1992: 90).

A Synthesis of the Sociological Approach

Ouchi's categorization of management control systems into markets, bureaucracies, and clans is somewhat parallel to Burris' (1989) division of management control structures. Burris takes an evolutionary approach to management control, asserting that management control has evolved through the following six stages: (1) the pre-industrial revolution craft and guild system, (2) simple control through direct supervision, (3) technical control as embedded in machine technologies, (4) bureaucratic control through rules and regulations, (5) professional control through ethical codes and professional self-regulation, (6) an emerging form of control dubbed "technocratic control" (Burris, 1989). According to Burris, until recently technical control, bureaucratic control, and professional control were the primary management control forms in large business organizations. These three management control forms closely parallel Ouchi's output, behavioral, and clan controls, respectively.

This body of work leads to several conclusions. Three major types of management control systems have been described: market control, bureaucratic control, and cultural control. Furthermore, there are two methods of exercising bureaucratic control: through monitoring outputs or monitoring behaviors. Given the contrasting findings of Ouchi and Maguire (1975) and Eisenhardt (1975), it is not clear whether output control and bureaucratic control are substitutes for each other; however, it is likely that a mixture of market, bureaucratic, and cultural control systems is possible within an organization (Snell, 1992; Kunda, 1992; Jaeger & Baliga, 1985; Ouchi, 1979; Ouchi & Maguire, 1975). This is consistent with the assertion that "disparate control structures have frequently coexisted and developed unevenly and in overlapping patterns. Most workplaces combine two or more of these forms of

control...." (Burris, 1989). This is not to say that the coexistence of multiple forms of management control is always peaceful. Bureaucratic and professional controls rest upon fundamentally conflicting principles, such as the dilemma of integration versus autonomy (Miller, 1967). Bureaucratic and clan controls may result in conflict, especially where self-regulating professionals work within bureaucracies. The rules inherent in bureaucratic controls may conflict with the autonomy inherent in clan control, and the orientation of bureaucratic control toward efficiency and profitability may conflict with professional attitudes toward competence and client satisfaction (Burris, 1989). Professionals are also typically less committed to the organization, reducing the ability of the organization to control them (Welsch & LaVan, 1981).

There are some questions this body of literature does not answer. For example, neither Ouchi nor his colleagues have clearly delineated the variables that determine managerial control system choices. Are these choices based on the social and information requirements, or on the ability to tolerate ambiguity and goal incongruence, or on other factors?

Table 3 summarizes the information systems, human relations, and sociological approaches to management control, and their contributions to this study.

The Management Control Model

The management control model developed for this research has its base in Ouchi's empirical and theoretical works reviewed in the first part of this chapter. Ouchi's markets-bureaucracies-clans framework provides the backdrop for the management control systems depicted in the model, while his output-behavioral-ritual controls provide the basis of the supervisory control methods depicted in the model. The model hypothesizes that technology, size, environment, and structure are important antecedents to management control systems, and that job satisfaction, organizational

commitment, and performance are crucial outcomes influenced by the management control process.

In essence, the model states that certain factors determine the choice of managerial control systems. The choice of managerial control system provides parameters for the choice of supervisory control methods, which must be consistent with the control system type. The congruence of the components of the model will influence outcomes at the organizational, subunit, and individual levels. Each component of the model may have feedback effects on the other components. This process is diagrammed in Figure 3.

The following sections review the organization theory literature relating to technology, size, environment, and structure. As each variable is reviewed, hypotheses are generated concerning the relationship of the variable to management control systems. Later, the antecedents of supervisory control methods are delineated and analyzed, with appropriate hypotheses for each. Finally, the outcome variables of job satisfaction, performance, and organizational commitment are presented, along with appropriate hypotheses.

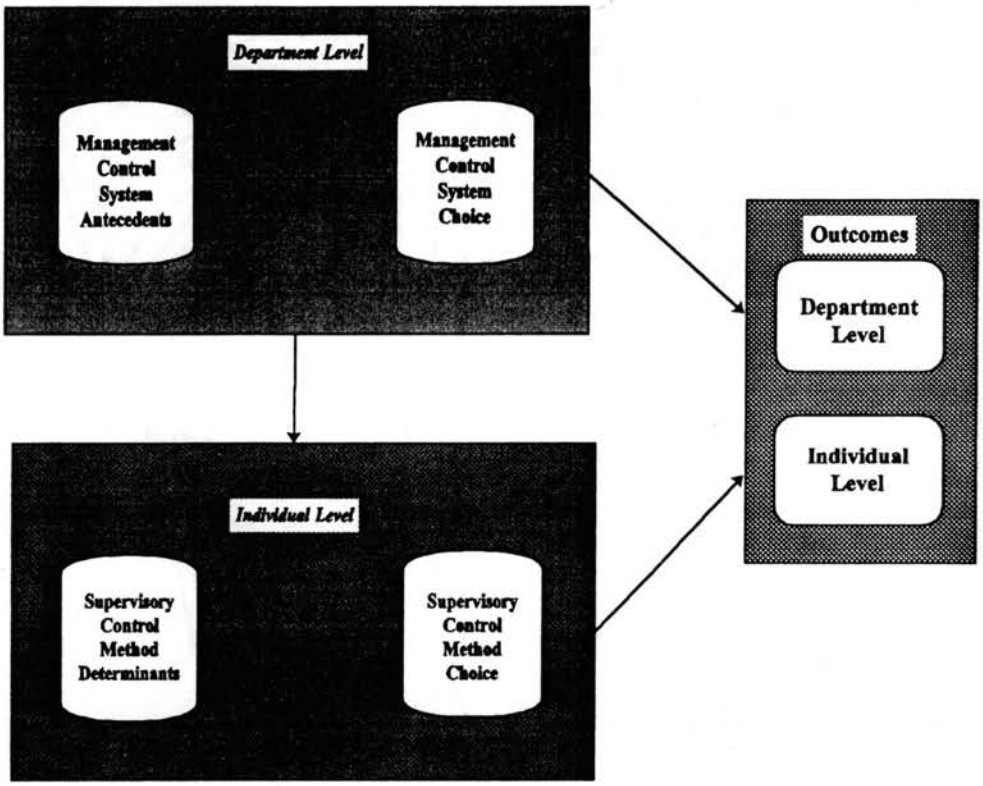
Contextual Elements and Control Systems

Using Ouchi's framework as a conceptual foundation, Daft (1989) developed a teaching model relating three of the classic organization theory context factors (size, technology, and environment), to the choice of managerial control systems. Daft also included organizational structure in the model, which is diagramed in Figure 4. Daft postulated that bureaucratic control was more acceptable under the conditions of a routine technology, stable environment, large size, and a functional structure. On the other hand, he postulated that clan control was more acceptable when dealing with a non-routine technology, unstable environment, small size, and matrix structure. Market

TABLE 3

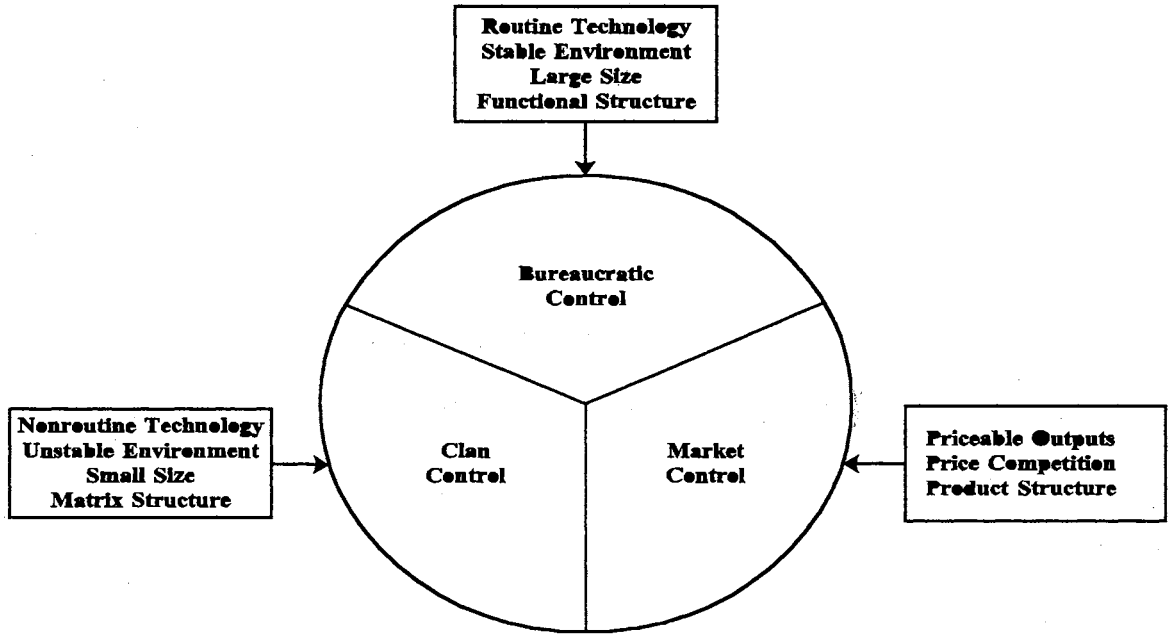
CONTRIBUTIONS OF THE INFORMATION SYSTEMS, HUMAN RELATIONS, AND SOCIOLOGICAL APPROACHES

Approach	*Viewpoint*	*Field*	*Contributions to this Study*
Information Systems	Process of control Information flows	Accounting MIS	Existence of information flows required for cybernetic control or output control Information prerequisites for market control or bureaucratic control
Human Relations	Consequences of control systems	Organizational Behavior Psychology	Substitutes for leadership: • task/workflow predictability • professional orientation Impact of control on job satisfaction Potential for self-control Importance of socialization
Sociological	Antecedents and determinants of control systems	Organization Theory Sociology	Output versus behavior control Markets, bureaucracies, clans framework Importance of shared values Social prerequisites for control Impact of market failures Agency theory & costs of control Potential for cultural control Importance of socialization



Source: Original Diagram

Figure 3. Model of Control Systems, Methods, and Outcomes



Adapted from Daft, R.L. (1989). *Organization theory and design*, 3rd. ed. St. Paul: West Publishing Co.

Figure 4. Contingency Model for Organizational Control Strategies

control would exist only under conditions where outputs could be priced and price competition existed. Market control would also fit best with a product structure. Because this model was developed primarily as a teaching tool, Daft (1989) did not subject it to empirical testing. There is evidence in the literature, however, for the plausibility of many of the relationships postulated by the model. This literature is reviewed in the following sections.

Technology

Technology studies have related this organizational variable to size, structure, performance, and other variables (Kraft, 1993; David, Pearce, & Randolph, 1989; Slocum & Sims, 1980; Child & Mansfield, 1972; Hage & Aiken, 1969). While few of these studies have explicitly examined the relationship between technology and management control, several of them provide evidence for such a relationship. Routine technology has been associated with increased centralization of organizational power, decreased participation in decision-making, and greater formalization (Hage & Aiken, 1969). Management control may also be an important moderator of the technology-performance relationship. In relating technology to performance, Ovalle argued that, "key to the technology-performance connection are the cognitive burdens imposed by tasks on the processes of organizational planning and control" (Ovalle, 1984: 1059).

Technology, especially task characteristics such as routineness and predictability, have been shown to be related to management control systems and methods. Hage and Aiken (1969) demonstrated a relationship between routine technology and the use of impersonal, bureaucratic control methods such as rules manuals and job descriptions. Woodward (1970) proposed that lower levels of technological complexity call for more mechanical, impersonal forms of management control; and that higher levels of technological complexity call for more personal and fragmented forms of management control. Hage and Aiken (1969) found less

interdependence of work groups in routine organizations, thus increasing the likelihood of bureaucratic, as opposed to cultural, management control systems. Also, organizations with routine technology were less likely to depend heavily on professionals, and had staffs with less training (Hage & Aiken, 1969). Comstock & Scott (1977) similarly found that greater task predictability was associated with lower staff qualifications and greater staff specialization.

Technological complexity has also been related to span of control: mass production technologies can be controlled effectively with broad spans of control, while job shop or process technologies require a narrower span of control (Woodward, 1965). Exceptions to this include organizations where wide spans of control can be tolerated due to worker professionalism, such as research laboratories (Lorsch, 1965). Woodward (1970) proposed that low levels of technological complexity are related to more impersonal control, and that the converse also holds. Simpler technologies, such as mass production, can be controlled through bureaucratic means, while more complex technologies, such as job shop or process technologies, require a narrower span of control (Woodward, 1965).

According to Slocum and Sims (1980), technology has two components: workflow uncertainty, and task uncertainty. The former refers to a worker's ability to know when inputs will arrive at his or her station for processing, while the letter refers to the employee's knowledge of how to accomplish his or her assigned task. Where both workflow uncertainty and task uncertainty are low, management can implement a management control system that allows for limited discretion. On the other end of the continuum, when both factors are high, employees can only be loosely controlled. Workers in hospital emergency rooms provide an example of this (Slocum & Sims, 1980).

A few studies have directly examined the relationship between technological characteristics and supervisory control methods. Ouchi and Maguire (1975) showed

that an understanding of means-ends relationships is positively related to behavioral control, while the availability of output measures is related to output control. Higher levels of task complexity were related to less complete output measures, and thus less output control (Ouchi, 1977). In addition, the ability to measure individual performance apparently is related to the use of bureaucratic control methods (Ouchi, 1980). Ouchi also found that the more homogeneous the task, the less complete the output measures (Ouchi, 1977). More complete output controls led to more output control. Snell (1992) found evidence that executives in technically-integrated firms had less measurable standards by which to measure individual performance, thus implying that routine technology leads to output control, while nonroutine technology leads to behavior control. Snell (1992) also concluded that firms using integrated technologies were less likely to use bureaucratic controls. Eisenhardt (1985) showed that task programmability was the most important predictor of the choice between behavioral and output control. She also found that the cost of measuring outputs was related to the use of output control; as measurement costs increased, output controls were used less frequently.

Trevino (1986) proposed a modification of the Ouchi framework for management control systems in service organizations due to the differences in technology. Although manufacturing organizations can seal off the technical core, service organizations cannot. Consumers introduce variability in the work flow (Snyder, Cox, & Jesse, 1982). Service workers must interact with clients much more frequently than in manufacturing organizations, and are usually accorded greater discretion, since flexibility in dealing with different client needs is required (Miller *et al.*, 1991). To some degree, since the task being performed by the service worker essentially is the service, the technology becomes the service (Mills, Turk, & Margulies, 1987). In addition, since the output of service organizations is typically intangible and difficult to separate into units, output controls are difficult to use (Mills

& Moberg, 1982). This has an impact on the nature of the control system used. Trevino's model, which has not yet been empirically tested, suggests that the type of management control system used is determined by task characteristics, especially task uncertainty; and by input uncertainty (see Table 4). Input uncertainty is influenced by the variety and unpredictability of client contacts and the intensity of the client/employee relationship. Where input uncertainty is high, the service worker must be given more discretion, and cannot be controlled by behavioral methods. Rather, socialization takes on more importance as a management control mechanism.

Van de Ven, Delbecq, and Koenig (1976) found that less routine and more uncertain technologies were associated with more personal forms of coordination. Furthermore, they found that group modes of management control (i.e., ritual control methods) were more effective than bureaucratic controls when task difficulty and variability were high (Van de Ven *et al.*, 1976). When workflow and task uncertainty are high, evaluation and control are more effectively performed by those close to the sources of uncertainty. Internal control systems designed by group members more effectively reduce the uncertainties that affect employees in that work group (Slocum & Sims, 1980). Worker professionalism, however, can substitute for narrow spans of control (Lorsch, 1965; Kerr & Slocum, 1981). Hage & Aiken (1969) found that routineness was related to a lower amount of staff training and a smaller number of professionals. Similarly, Miller *et al.* (1991) found evidence to suggest that professionalization and professionalism are alternative management control mechanisms, and that professionalism is incompatible with the constraints imposed by formalization.

Taken together, these studies (Reeves & Woodward, 1970; Comstock & Scott, 1977; Glisson, 1978; Slocum & Sims, 1980; Jones, 1984) imply that technology has an impact on both management control systems and supervisory control methods in organizations. Specifically, it appears that routine technologies should lead to

TABLE 4

TECHNOLOGY AND MANAGEMENT CONTROL SYSTEMS IN SERVICE ORGANIZATIONS

	Input Uncertainty	
Task Uncertainty	**Low**	**High**
Low	Behavior Control • Rules • Supervision • Procedures	Output Control • Commissions • Sales Goals Socialization Control • Selection • Training
High	Identification Control Output Control	Socialization Control • Selection • Training Identification Control

Adapted from Trevino, L.K. (1986). The technology/control relationship in service organizations. Paper presented at the 1986 Academy of Management meetings.

bureaucratic control systems, while nonroutine technologies lead to cultural control systems. Task complexity and the availability of output measures appear to influence the supervisory control method choice between behavioral and output control.

Hypothesis 1a: At the department level, routine technology will be associated with bureaucratic management control systems.

Hypothesis 1b: At the department level, non-routine technology will be associated with cultural management control systems.

Size

Daft's (1989) model contends that organizational size is related to managerial control methods. Specifically, he proposed that larger organizational size—as measured by number of employees—would be congruent with bureaucratic control, while smaller organizational size would be congruent with clan control. This proposition, while intuitively appealing, has not been directly tested; yet there is evidence to support its validity. A number of studies have related larger organizational size to elements of a bureaucratic structure, such as formalization, differentiation, specialization, and standardization. Larger organizations tend to have more formalization than small organizations (Bluedorn, 1993; Yasai-Ardekani, 1989; Pugh *et al.*, 1969). Organizational size has been shown to be related to vertical and horizontal differentiation (Abdel-khalik, 1988; Meyer, 1968; Goldman, 1973, Bacharach & Aiken, 1976, Mileti, Gillespie, & Haas, 1977). Horizontal differentiation refers to the number of divisions and the division of labor, while vertical differentiation measures the number of hierarchical levels (Child, 1973a). Size has also been shown to be related to structural differentiation (Blau & Schoenherr, 1971; Childers, Mayhew, & Gray, 1971; Blau, 1972), functional differentiation (Moch, 1976), and specialization (Mayhew,

James, & Childers, 1972; Moch, 1976; Hickson *et al.*, 1969; Pugh *et al.*, 1969; Child, 1973a).

Organizational size has also been shown to be related to the complexity or decentralization of the organization (Bluedorn, 1993; Marsh, 1992; Yasai-Ardekani, 1989; Hall, Hass, & Johnson, 1967). Campbell and Akers (1970), in a study of voluntary associations, found that organizational size was positively related to both horizontal complexity at the national level of the organizations, and to vertical complexity, i.e., the number of regional, state, and local sub-units, and the lowest level at which there was national recognition. Heydebrand (1973), in a study of almost 7000 hospitals, found that the size of the hospital was related to the complexity of the organization, including the number of medical services offered and medical specialties represented.

Idson (1990), using data from the 1977 Quality of Employment Survey, examined the relationships between organization size, structural rigidity, and job satisfaction. He found that larger establishments are more structurally rigid, thereby reducing the freedom of individual employees. Lower levels of job satisfaction were associated with this structural rigidity. Kraft (1993), in a reexamination of Child's (1972) study, showed that the interaction of size and structure was related to several financial and non-financial measures of performance. Kraft (1993) also found that the interactions of structure, size, environmental complexity, and technology had a relatively strong impact on non-financial measures of performance (sickness, accidents, absenteeism, work stoppages), with a lesser impact on financial measures of performance (sales to net assets, income to net assets).

Several studies have attempted to determine whether size or technology has the greatest impact on organization structure. This search for either a "size imperative" or "technology imperative" promulgated a vast amount of research, some of it contradictory. Studies supporting the contention that technology is the most significant

correlate of organization structure include those of Woodward (1965) and Zwerman (1970). Other studies have indicated that size is the more important correlate of structure (Blau, 1970; Blau & Schoenherr, 1971; Pugh *et al.*, 1969; Hickson *et al.*, 1969). Child and Mansfield (1972) found that technology was associated with structure, but size was associated more strongly. Technology, however, appears to be more related to structure in small organizations (Hickson *et al.*, 1969; Child & Mansfield, 1972). The imperative argument was rekindled when, in a study of fifty Japanese factories, Marsh and Mannari (1981) found that while size affected structural differentiation and formalization, technology affected several other aspects of structure more strongly. Marsh and Mannari's (1981) methods were disputed by Singh (1986), who concluded that the technology imperative was not given new life by Marsh and Mannari's study.

When examining the relationships between size and structure at the organizational level, tradeoffs between centralization and formalization become evident (Zeffane, 1989). Larger organizations adopt decentralization as a means of reducing top management overload (Child, 1984), while simultaneously increasing formalization in an attempt to handle complexity and maintain control. Thus increased formalization serves to regain the control lost in the process of decentralization. This implies substitutability between centralization and formalization as structural control mechanisms (Zeffane, 1989).

Results often differ when technology and size are measured at the departmental level, as recommended by some researchers (David *et al.*, 1989; Van de Ven *et al.*, 1976; Lynch, 1974; Ford & Slocum, 1977; Comstock & Scott, 1977). For example, Comstock and Scott (1977) found that both size and technology were important predictors of staff differentiation and centralization of routine decisions when measured at the departmental level. Miller *et al.* (1991) found more positive relationships between routineness and centralization when the average size of units was small rather

than large. Comstock and Scott concluded that for subunits, "the effects of size were not as pervasive as those of technology but were clearly an important determinant of some staff characteristics and at least one feature of the control system" (1977: 197). Subunit size has been shown to be negatively related to performance and productivity (Carillo & Kopelman, 1991; Gooding & Wagner, 1985). The negative relationship of subunit size and performance may be caused by free-riding tendencies (Jones, 1984; Fleishman, 1980) or by higher coordination costs (Steiner, 1972). Free-riding tendencies are most acute in large subunits because low task visibility increases the difficulty of monitoring individual performance (Jones, 1984). The negative relationship of size and performance at the subunit level may not exist at the organizational level. Larger organizations often have the financial resources necessary to control or adapt to their environment (Pfeffer & Salancik, 1978).

Wilkins and Ouchi (1983) theorized that smaller organizations or departments, and especially smaller professional or functional groups, were more likely to develop the shared meanings and values necessary for cultural control. As organizations increase in size, they tend to become more bureaucratic, specialized, and complex. With this increase in specialization and complexity, control tends to become indirect and impersonal (Child, 1973b). Larger size also tends to lead to structural decentralization and increased formalization. It is not clear, however, how the size of the organizational subunit or department interrelates with the size of the firm; nor are the relative effects of organization size and department size clearly understood. Small departments should, however, find it easier to develop a system of shared meanings and values consistent with cultural control. The size of the organizational subunit, therefore, is expected to be related to the type of managerial control system used in that subunit.

Hypothesis 2a: Larger organizational subunits will tend to use bureaucratic control systems.

Hypothesis 2b: Smaller organizational subunits will tend to use cultural control systems.

Environment

Organization theorists have studied environment largely from two perspectives: an information-processing perspective, and an environmental dependence perspective (Koberg & Ungson, 1987). In the information-processing perspective, managerial perceptions of the external environment lead to decisions concerning organizational responses to environmental changes (Galbraith, 1973; Lawrence & Lorsch, 1967). In the environmental dependence perspective, resource munificence or scarcity serve as constraints to managerial decision-making. The ability of organizations to obtain and utilize critical resources leads to changes in the organization (Pfeffer & Salancik, 1978; Hage & Aiken, 1967). Recent evidence indicates that environmental scarcity or munificence may moderate the relationship between perceived environmental uncertainty and structural characteristics (Yasai-Ardekani, 1989). As a result, environmental scarcity or munificence may moderate the results found in studies employing the information-processing perspective. When the two perspectives are combined, three environmental dimensions emerge: complexity, dynamism, and munificence (Bluedorn, 1993). Complexity refers to the amount of knowledge necessary to understand a changing environment. Dynamism reflects the degree of unpredictable change in the environment, and munificence refers to resource availability (Sharfman & Dean, 1991).

Consistent with the information processing perspective and the typical findings of contingency theory (McCabe, 1990; Van de Ven & Drazin, 1985), Daft (1989) theorized that a relatively stable environment would be most congruent with bureaucratic control, while an uncertain or unstable environment would be most congruent with clan control. When environmental uncertainty is low, standardized

rules, procedures, and controls can be used; where environmental uncertainty is high, the need for coordination increases, with an increased need for communication and interdependence among organizational members (Tjosvold, 1986; Duncan, 1972; Lawrence & Lorsch, 1969). One reason for this relationship is the requirement of stability for decision-making (Weick, 1987). Rational decision-making works best in a stable environment. In unstable environments, sense-making precedes decision-making (Weick, 1987). Environmental complexity has a strong influence on organizational structure (Keats & Hitt, 1988). Managers deal with environmental complexity through divisionalization, which fosters the creation of specialized knowledge for dealing with specific environments (Williamson, 1975). Organic structures, which tend to provide the best performance under conditions of environmental uncertainty, are consistent with less bureaucratic control systems.

From the dependence perspective, under conditions of environmental scarcity, organizations often resort to increased formalization and centralization of decision-making (Cameron & Zammuto, 1983). Koberg & Ungson (1987) found that the greater the resource dependence, the less organic the structure. They also found some evidence that the ability to control resources was related to firm performance. Thus environmental uncertainty was negatively related to organic structures, implying that greater environmental uncertainty leads to more mechanistic, bureaucratic control systems. In the Koberg & Ungson (1987) study, when organizations found themselves in an uncertain environment, rather than loosening control and increasing flexibility to deal with the uncertainty, organizational subunits developed more bureaucratic structures, and increased centralization and standardization.

An integration of the resource dependence perspective and the information-processing perspective appears to provide the most realistic picture of the relationships between environmental uncertainty and management control. For example, Yasai-Ardekani (1989) found that in munificent environments, the traditional prescriptions of

the information-processing school apply. Therefore, the response to increased environmental uncertainty is greater decentralization of decision-making, increased specialization, decreased formalization, and a loosening of management control. Under conditions of scarcity, however, managers respond to increased perceived environmental uncertainty by centralizing decision-making, increasing formalization, establishing more direct lines of communication, and tightening management control (Yasai-Ardekani, 1989). Centralization of decision-making under conditions of scarcity, however, applied only to strategic decisions, not operating ones. This implies that the effects of scarcity are more pronounced at the organizational level than at the operating unit level. According to Yasai-Ardekani (1989), the responses to scarcity are similar to the responses to organizational crisis indicated by the threat-rigidity model, in which organizations encountering crises shift toward a more mechanistic structure (Staw, Sandelands, & Dutton, 1981). This implies that organizations equate times of resource scarcity with crises.

Milliken (1987, 1990) notes that care is necessary when studying environmental uncertainty in organizations. One issue is the question of actual versus perceived environmental uncertainty: should environmental uncertainty be measured by objective measures, or by the perceptions of organizational members? While individuals may have some choice in enacting or constructing their environment (Weick, 1979), the existence of an objective environment may serve as a constraint on organizational decision-making (McCabe, 1990). Some organization theorists argue that decision makers' views on the organization's position in the environment are more important than its actual position (Child, 1972). Also of importance is the level of analysis specified by the research questions. Researchers must "assess munificence of the particular resource pool or sub-environment most relevant to a specific research purpose" (Castrogiavanni, 1991: 548). The type of measurement used (objective versus subjective) is determined by the level of analysis. Subjective measures are

preferred at the department level (referred to as the resource pool or sub-environment levels). Objective measures are not likely to produce the same results as subjective measures (Sharfman & Dean, 1991; Dess & Rasheed, 1991).

The second problem noted by Milliken (1987, 1990) is the validity of the construct labeled "perceived environmental uncertainty." She proposes that this term has been used to encompass three different constructs: (1) *state uncertainty*, which is uncertainty about the state of a particular component of the environment; (2) *effect uncertainty*, which relates to the ability or inability to predict the impact of environmental changes on the organization; and (3) *response uncertainty*, which relates to the ability or inability to predict the consequences of a particular response to the environment.

No studies have empirically addressed the relationship among these three types of uncertainty and management control systems. Since, according to Milliken (1987), state uncertainty most closely resembles Duncan's (1972) perceived environmental uncertainty construct, it is reasonable to expect organizations or departments that experience high levels of state uncertainty to use more clan control systems, while those that experience low levels of state uncertainty will tend to use more bureaucratic control systems. Bureaucratic controls are inconsistent with unstable environments, in that high environmental uncertainty leads to the inability to specify the detailed procedures and guidelines necessary to implement bureaucratic controls. In addition, the high rate of change inherent in uncertain environments is also inconsistent with bureaucratic controls. In organizations or sub-units with low environmental uncertainty, however, bureaucratic controls can be used effectively. Low environmental uncertainty, therefore, should lead to increased use of bureaucratic controls, while high environmental uncertainty should lead to cultural controls. Scarcity, however, is expected to be associated with a bureaucratic management control system.

Hypothesis 3a: Under conditions of munificence or scarcity, if management of an organizational subunit perceives little environmental uncertainty, then bureaucratic control systems will predominate.

Hypothesis 3b: Under conditions of munificence, if management of an organizational subunit perceives a high degree of environmental uncertainty, then the control system will be cultural.

Hypothesis 3c: Under conditions of scarcity, if management of an organizational subunit perceives a high degree of environmental uncertainty, then the control system will be bureaucratic.

Structure and Management Control Systems

An organization's structure influences information flows within the organization, as well as the context and nature of human interactions (Miller, 1987). Thus structure affects the organization's management control systems. Ouchi (1977) found evidence that certain structural dimensions are related to the choice of bureaucratic control methods. Specifically, vertical and horizontal differentiation appear to be positively related to the completeness of output controls, and the completeness of output controls appears to be related to the frequency of output control. Daft's (1989) model proposes that organizational structure is related to the choice of control systems. According to Daft, a functional structure implies bureaucratic control, while a matrix structure works best with clan control methods.

A closer look at Daft's proposals, however, demonstrates that an organic versus mechanistic structure dimension (Burns & Stalker, 1961) relates better to the choice of managerial control systems. In a mechanistic structure, tasks are broken down into separate jobs that are functionally specialized, and are defined and coordinated through a formal hierarchy. The methods used for accomplishing tasks are precisely defined, and the knowledge of this methodology tends to be located toward the top of the

hierarchy. There is a hierarchical authority structure, and loyalty and obedience are expected and required. Communication tends to be vertical, and behavior is governed by instructions of superiors (Meadows, 1980).

In an organic structure, however, interaction with co-workers is emphasized, commitment to the firm is important, lateral communication is encouraged, and superiors tend to follow an advisory role. Methods are not precisely prescribed, and knowledge about the task may be located anywhere in the network. Commitment to the "technological ethos" is more highly valued than loyalty and obedience (Meadows, 1980).

Barley and Kunda (1992) refer to bureaucratic controls as rational control and cultural controls as normative control, and note that mechanistic and organic structures are associated with normative and rational ideologies of control, respectively. Thus a mechanistic-organic distinction provides a more generalizable and clear-cut distinction than Daft's functional/matrix proposition, while not being inconsistent with it. There is a tendency for functional structures to be more mechanistic and matrix structures be to more organic, but this is not always the case. That bureaucratic control systems will predominate in mechanistic structures, and that clan control systems will predominate in organic structures, however, appears to be logically consistent.

Cultural control is consistent with decentralized, organic structures, but may require a period of centralization prior to decentralization. This period of centralization allows for socialization and the learning and retention of similar decision premises (Weick, 1987).

The functional specialization, hierarchical decision-making, and vertical communication patterns of mechanistic structures are consistent with bureaucratic control systems. The more adaptable, less specialized, more decentralized characteristics of organic structures are consistent with cultural control systems.

Hypothesis 4a: If an organizational subunit is perceived as having a mechanistic structure, it will tend to use bureaucratic control systems.

Hypothesis 4b: If an organizational subunit is perceived as having an organic structure, it will tend to use cultural control systems.

Managerial Control System Antecedents

The managerial control system antecedents that are examined in this research are the context factors of size, technology, and environment, along with the structural type (organic/mechanistic). These factors should be instrumental in the choice of managerial control systems. Hypotheses concerning these relationships have already been set forth. The comprehensive control model (Figure 5) illustrates the hypothesized relationships.

A modification of Ouchi's (1979, 1980) three control systems—markets, bureaucracies, and clans—best describes the managerial control system choices available to an organizational subunit. The model uses the term "cultural control" instead of "clan," since the concept of cultural control appears to include clan control as well as other forms of cultural control, such as professional controls. Once the managerial control system has been determined in accordance with the relevant context factors and structural form, the supervisory control method should be determined. The supervisory control method must be consistent with the managerial control system; therefore, only a limited number of supervisory control method options are available for each managerial control system choice. Hypotheses concerning the determinants of supervisory control methods are generated below.

Finally, the choice of management control systems and methods and the congruence among the components of the model will affect organizational outcomes such as satisfaction and performance. Hypotheses concerning these outcomes are presented later.

Supervisory Control Method Antecedents

The following section examines the antecedents of the supervisory control methods. The factors influencing the choices between prices and contracts, between behavior and output control, and between ritual and professional controls, are examined, and corresponding hypotheses are presented. These relationships are also shown in Figure 5.

Prices versus Contracts

With market control, prices or contracts will provide specific control (Ouchi, 1979, 1980). The extent of contracting required, as opposed to reliance on a frictionless price mechanism, is largely related to the extent of competition and to the transactions costs involved (Williamson, 1981). Essentially, where an efficient price mechanism exists, prices will be the specific control method. Inefficiencies in the price mechanism bring forth the need for contractual arrangements. Therefore, under market control, where an efficient price mechanism exists, prices will provide specific control; where an inefficient price mechanism exists, contracts will augment the price mechanism.

Behavior versus Output Control

In a bureaucratic control system, the supervisory control method choice will be between output and behavioral control. This choice is determined by task characteristics, such as the ability to measure outputs and knowledge of the transformation process (Ouchi, 1977); task and input uncertainty (Trevino, 1986), or the nature of the task and the cost of output measures (Eisenhardt, 1985). This literature leads to the following hypotheses concerning the determinants of bureaucratic control methods:

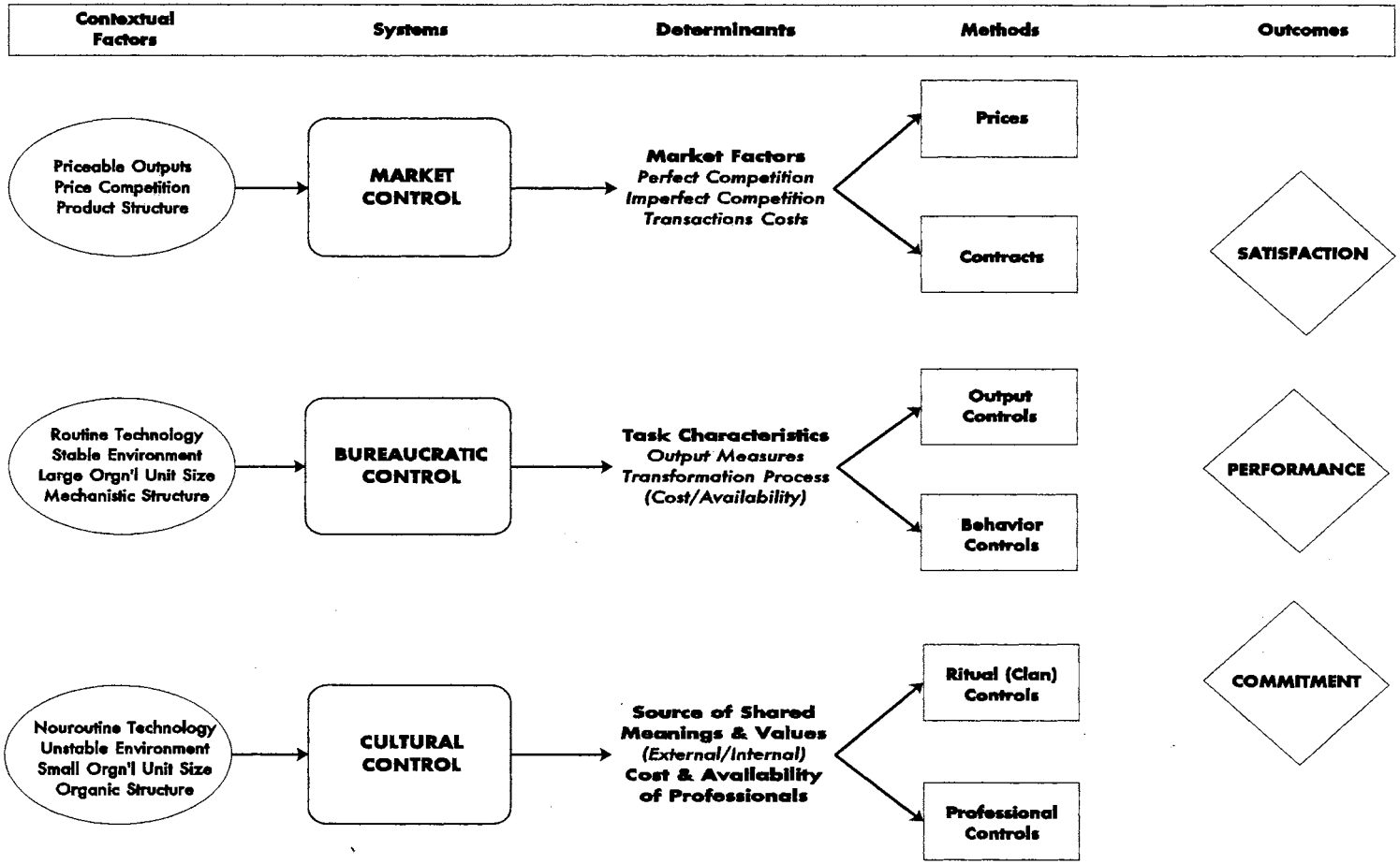


Figure 5. Comprehensive Management Control Model

Hypothesis 5a: If the level of task complexity is high and the ability to measure outputs is high, output controls will be used.

Hypothesis 5b: If the level of task complexity is low and the ability to measure outputs is low, behavioral controls will be used.

Hypothesis 5c: If the level of task complexity is low and the ability to measure outputs is high, there will be no clear preference for either behavioral or output controls.

Note that no hypothesis is given for the situation in which task complexity is high and the ability to measure outputs is low. This is the situation in which Ouchi (1975,1979) predicted that ritual controls would be used. In the model developed for this study, the technology of this situation would lead to the use of cultural controls.

The same pattern holds true when developing hypotheses about the effects of input uncertainty. In Trevino's (1986) model, high task uncertainty results in either identification control or socialization control. These are both cultural control methods. Low task uncertainty results in either behavior or output controls, which are both bureaucratic control methods. Under low task uncertainty, therefore, the key factor differentiating between the use of behavior and output control in Trevino's (1986) model is the level of input uncertainty.

Hypothesis 6a: Under conditions of low task uncertainty, if the level of input uncertainty is high, output controls will be used.

Hypothesis 6b: Under conditions of low task uncertainty, if the level of input uncertainty is low, behavioral controls will be used.

Incorporating Eisenhardt's (1985) agency theory variables into the supervisory control method choice requires adding the cost of output measures to the hypothesized relationship.

Hypothesis 7: Under a bureaucratic management control system, when output measures are not readily available or are expensive to obtain, behavioral controls will be used.

Ritual versus Professional Controls

If cultural control is chosen as the major control system, then the choice of a specific control method should be between ritual control and professional control. Ritual control is similar to Ouchi's clans or Baliga and Jaeger's cultural control system, while professional control is similar to Trevino's (1986) identification control. It should be noted that the group self-management process associated with ritual control does not necessarily make ritual control less onerous than the bureaucratic control methods of behavior and output control. In fact, ritual control methods may be more constraining than bureaucratic ones (Kunda, 1992; Manz & Angle, 1987).

While Trevino felt that the determination of socialization versus identification control was based on input uncertainty, it appears more likely that the choice is determined on the basis of the shared meanings and values present in the cultural control system, and by the cost and availability of professional employees. Shared values are a key element in the definition of culture, and are created by social expectations and internalized beliefs (Wiener, 1988). These values are similar to norms in guiding organizational members toward uniformity of behavior, and have been shown to be positively related to performance (Abernethy & Stoelwinder, 1991). Where the organization is the primary contributor to the system of shared meanings, ritual or clan control is being used; where forces outside the organization (e.g., professional affiliations) are the source of the shared meanings and values, then professional control will be the primary supervisory control method. Where professionals control core production processes, such as in hospitals, there is often "no options in these organizations but to rely on professional modes of control" (Abernethy & Stoelwinder, 1995). The orientation and expertise of professionals should reduce the need for task-related information and organizationally-created control methods (Abernethy & Stoelwinder, 1995; Kerr & Slocum, 1981; Miller, 1967). Professionals

often expect to exercise self-control, especially those with the Ph.D. degree, who usually participate more in work decisions, have more individual freedom, and enjoy more professional incentives (Miller, 1967; Pelz & Andrews, 1962).

Ritual control, as compared to professional control, entails a loss of self-control, in that professional controls are either internalized or imposed by organizations separate from the work setting, whereas ritual controls are imposed by the workgroup (Kunda, 1992; Manz & Angle, 1987). For ritual controls to be effective, the organization must be able to influence workers to identify with organizational goals. This assumes that workers will behave in an administratively rational manner—an assumption that may be realistic for most employees, but may not be realistic for professionals (Abernethy & Stoelwinder, 1991). Whether ritual or professional controls are used may depend upon which source of shared meanings and values is available to the organization, and the cost of obtaining or training employees with the requisite values. Thus, if organizations can purchase professional employees on the open market that have already been socialized with an organizationally-relevant value system, then professional control will be used. Note that the prevailing culture of professional workers may either be congruent with the goals of the organization, in which case it will be an asset to the organization; or may be supportive of the wrong values, thus becoming a liability (Wiener, 1988). On the other hand, if such employees are not available, either because the skills needed are not provided by strongly-socialized professionals or because the available professionals have been socialized in a manner not suitable for a particular organization, then the organization will have to bear the costs of socialization, and will rely on ritual control.

Large, decentralized organizations may possess multiple subcultures (Wiener, 1988; Louis, 1985; Gregory, 1983). This may appear in the form of an organization with a dominant culture with distinct subcultures formed in response to differences in the internal and external environments of subunits (Cooke & Rousseau, 1988).

Similarly, a large organization with a strong organization-wide culture may be able to tolerate decentralization because of the cultural control system.

One example of firms that frequently use ritual controls are high-technology firms, which do not typically control activities through bureaucratic mechanisms or standardized rules and procedures. Instead:

> High-technology firms deploy cultural norms as implicit rules of conduct to provide a uniform, yet broad, method of control. These provide an overarching framework within which members can operate and provide guiding principles and rules of thumb for dealing with unforeseen contingencies as they arise. These norms are communicated and reinforced through the process of socialization and performance evaluation. Moreover, the convergence of ownership interests and managerial control provides an additional means of control, since the employees' financial incentives are closely coupled with the firm's performance as a whole (Bahrami & Evans, 1987).

To maintain a cultural control system requires appropriate selection and retention, socialization, and ongoing support (Kunda, 1992). Organizations must select members who are high in general values of loyalty and duty, and who appear to have values congruent with those of the organization. Such organizations are likely to use lengthy employment interviews that focus on personality and individual values (Wiener, 1988).

Dunham (1989) investigated the extent and effects of shared meanings and values among educational administrators in the Mormon educational system. Informal controls helped determine performance expectations in a manner not readily apparent to those outside the system. Dunham concluded that shared meanings and values provide strong influence in these organizations, and that these cultural elements facilitate communication, commitment, and cooperation among organizational members. Abernethy and Stoelwinder (1991) examined the relationship between a "system goal orientation," meaning congruence with the organization on major goals that relate to the maintenance of the organization, and the use of budgeting for

performance evaluation. They found that the existence of a system goals orientation had a positive impact on performance. On the other hand, Davidson (1988) studied the effectiveness of clan control in auditing firms, hypothesizing that the shared values of the auditing profession would result in the use of clan control. Davidson's results generally supported the descriptive validity of the Ouchi model, but failed to find a high level of shared meanings and values among the employees of auditing firms, and thus failed to find the extent of clan control hypothesized.

Hypothesis 8: If the organizational subunit uses a cultural control system, and suitable professionals are available at a reasonable cost, then professional control will be used.

Hypothesis 8a: If professionals are available to the organization, and their professional socialization is congruent with the values of the organization, then professional supervisory control mechanisms will be used.

Hypothesis 8b: If professionals with requisite values are not available to the organization, then the organization will use ritual supervisory control methods.

Outcomes

The model includes several possible outcomes resulting from the choice and congruence of control systems and methods. The three outcomes analyzed by this study are performance, job satisfaction, and commitment. The following sections generate hypotheses for each of these outcomes. The hypothesized relationships are depicted in Figure 6.

Job Satisfaction

Satisfaction—in the form of job satisfaction, work-group satisfaction, or satisfaction with the control system—should be related to the choice and congruence of control systems and methods. In Snavely's (1987) study of hospital nurses, job satisfaction and

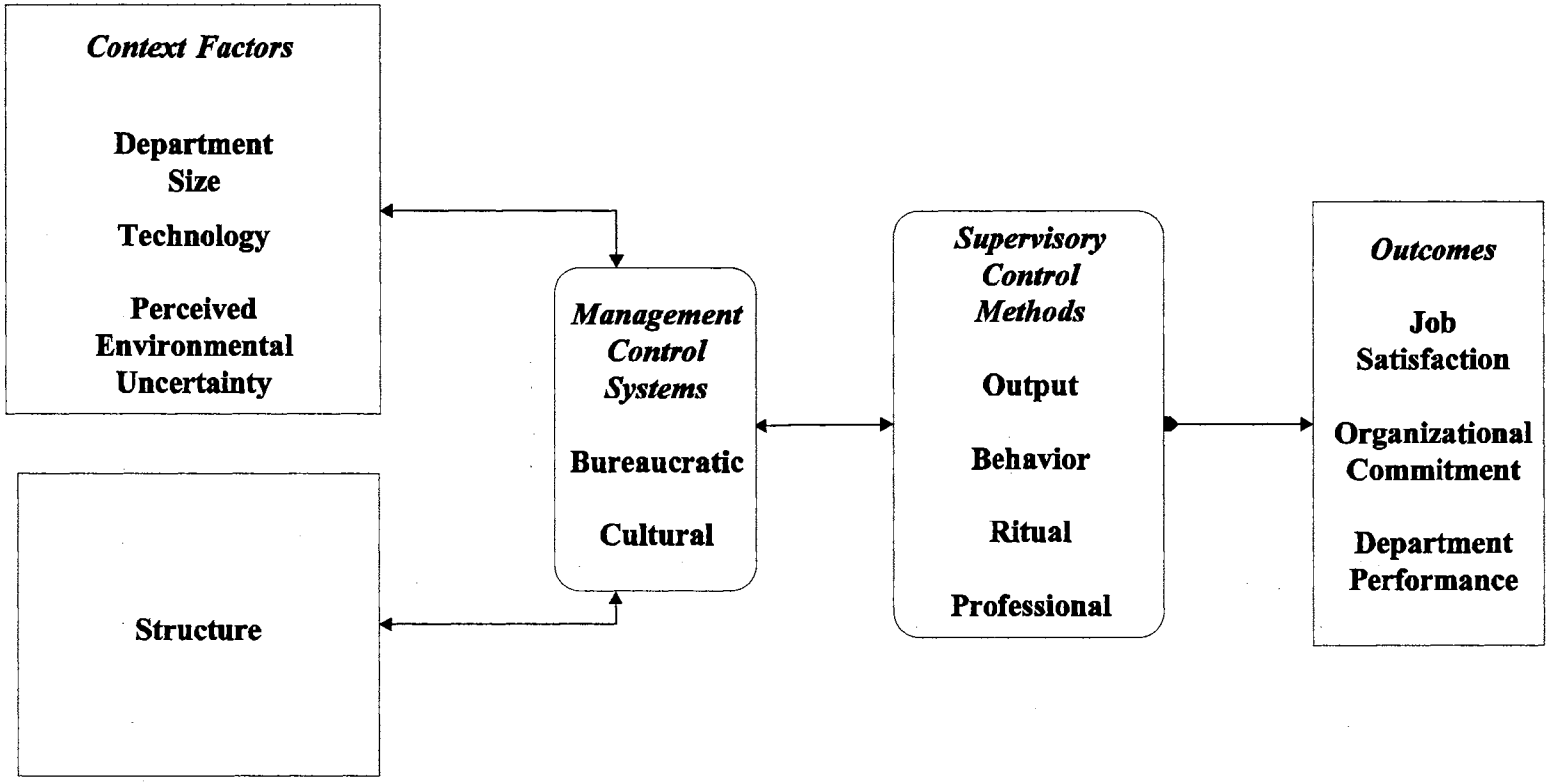


Figure 6. Fit of Control Model and Relationships to Job Satisfaction, Department Performance, and Organizational Commitment

performance correlated with bureaucratic methods of control. If bureaucratic control methods are appropriate for nursing personnel, then job satisfaction should be higher when bureaucratic controls are being used (Schwartz, 1990; Payson, 1988). Generally speaking, higher levels of job satisfaction should exist when the management control system and supervisory control methods exist as specified in the model. This is in contrast to Das (1989), who suggested that clan (cultural) controls are superior to bureaucratic controls, and that organizations would be better served by sending cultural control information through its information system rather than bureaucratic rules and regulations.

Job satisfaction and other job attitudes such as perceptions of job stress have been shown to be related to perceptions of the management control system (Leigh, Lucas, & Woodman, 1988). For example, Miller (1967) found that inappropriate control systems were related to alienation among professional employees. Where research freedom or professional climate was curtailed, professional alienation was high (Miller, 1967). The following is a normative hypothesis based this model of management control systems and methods:

> Hypothesis 9: If the perceptions of the contextual and structural factors and the department's management control systems are congruent, and the perceptions of its management control systems and supervisory control methods are congruent, then the level of perceived job satisfaction will be higher than when the systems are not congruent.

On the other hand, there is some support for the hypothesis that job satisfaction will be higher under cultural control than under bureaucratic control. Individuals with shared values may share cognitive processing methods, resulting in the reduction of uncertainty and stimulus overload and the enhancement of coordination, job satisfaction, and organizational commitment (Meglino, Ravlin, & Adkins, 1989). In a study of production workers and their supervisors, satisfaction and commitment were

higher when the values of workers were more congruent with those of their supervisors (Meglino *et al.*, 1989). In a study of 32 units of a non-profit organization, Rousseau (1990) found that staff members' attitudes were positively affected by teamwork-oriented norms. As mentioned earlier, however, Snavely (1987) found that more bureaucratic methods of management control were positively related to satisfaction.

In this hypothesis, along with the next two hypotheses, congruence has been defined as an agreement between perceptions of the management control systems and methods. It should be noted that this congruence can take place in more than one manner. First, congruence may refer to a within-person agreement: if an individual perceives congruence between the control systems and methods, then job satisfaction should be high. Second, congruence may refer to an agreement among the members of a department: if the members of the department perceive congruence between the management control systems and methods, then job satisfaction should be high. Third, congruence may refer to an agreement between the members of a department and their supervisor: if these perceptions are congruent, then job satisfaction will be high.

Performance

Because the purpose of management controls is to ensure goal accomplishment, performance at the organizational, department, and individual level is of interest. Effective management control systems should be related to the level of performance achieved (Todd, Thompson, & Dalton, 1974). Govindarajan and Fisher (1990) found that the fit between strategy, resource sharing, and management control method impacted perceived SBU performance. While using different variables than this research, their results suggest that the fit of management control with organizational variables should impact perceived performance. Managers should design management control systems to match the context of the organization, leading to higher performance (Abernethy & Stoelwinder, 1995, 1991).

Hypothesis 10: If a department's management control systems are congruent with its contextual and structural factors, and its management control systems and supervisory control methods are congruent, then the level of subunit performance will be higher than when the systems are not congruent.

There is also support for the contention that cultural control, as opposed to bureaucratic control, may be positively related to performance. This contention may be based on the premise that bureaucracies discourage creativity and innovation (Gerstner, 1991). Rousseau (1990) found that centralized, bureaucratized decision making was negatively related to performance.

Commitment

Organizational commitment has been defined as "the relative strength of an individual's identification with and involvement in a particular organization," and has at least three related factors: (1) a belief in and acceptance of an organization's values, (2) a willingness to exert significant effort for the organization, and (3) an intention to continue membership in the organization (Mowday, Steers, & Porter, 1979: 226). When compared with the construct of job satisfaction, organizational commitment tends to be more global and more stable over time (Mowday *et al.*, 1979). Organizational commitment has also been shown to be highly correlated with constituency-specific commitments, and thus reflects work-group commitment with some accuracy (Hunt & Morgan, 1994). Commitment has been shown to be related to the culture of the organization. As mentioned above, when the values of supervisors and workers are congruent, organizational commitment increases (Meglino *et al.*, 1989). Managers who perceive a high degree of shared values with their organizations are more likely to remain with the organization and to work long hours for their employers (Posner *et al.*, 1985).

There is support, therefore, for hypothesizing higher levels of perceived organizational commitment based on congruence of context and structure, the management control system, and supervisory control methods. However, there is also support for hypothesizing that cultural control should lead to higher levels of commitment than bureaucratic control, in that congruence of values has been associated with higher levels of organizational commitment (Meglino *et al.*, 1989; Posner *et al.*, 1985). Congruence of values may be more important than congruence of systems; if so, then the shared values engendered by cultural control should lead to higher levels of organizational commitment. Finally, the two specific cultural supervisory control methods should produce different levels of organization commitment. Under professional control, the worker is only loosely tied to the organization; much of the commitment is to the profession, although this commitment may shift toward the organization when a professional becomes an employee (Abernethy & Stoelwinder, 1995). Wallace (1995) found that organizational commitment of lawyers in nonprofessional firms was dependent on perceived opportunities for career advancements, but was lower than the organizational commitment of lawyers in professional firms. In addition, he found that the professional commitment of lawyers was significantly higher in professional firms than in nonprofessional firms (Wallace, 1995). Under ritual control, however, commitment to the organization is encouraged through the socialization process, or is required by the culture of the organization (Kunda, 1992).

Hypothesis 11a: If a subunit's management control systems are congruent with its contextual and structural factors, and its management control systems and supervisory control methods are congruent, then the level of organizational commitment will be higher than when the systems are not congruent.

Hypothesis 11b: If a subunit uses cultural controls, organizational commitment will be higher than if it uses bureaucratic controls.

Hypothesis 11c: Organizational commitment will be higher when ritual controls are used than when professional controls are used.

Hypotheses 9, 10, and 11(a) are primarily tests of the congruence of the model. Essentially, when all elements in the organization are congruent, performance should increase. The same principles apply to management control that Child (1972) applied to the relationship between context elements and structure:

> With respect to internal variables, strategic action will involve an attempt, within the limits of availabilities and indivisibilities, to establish a configuration of manpower, technology, and structural arrangements which is both internally consistent and consistent with the scale and nature of operations planned. The 'goodness of fit' that is...achieved is seen to determine the level of efficiency secured....The conjunction of efficiency with demand will determine the organization's overall level of performance (Child, 1972: 17).

For example, David *et al.* (1989) found that the fit between group-level technology and structure served as a good predictor of performance. The fit between environment and structure is one of the key propositions in structural contingency theory (Koberg & Ungson, 1987; Drazin & Van de Ven, 1985).

Competing hypotheses are also supported by the research literature. For example, Mak (1989) showed that the internal consistency between management and operational (supervisory) controls had a greater effect on the performance of a firm than did its fit with external contingency factors. Specifically, he found higher performance when the management control system and the operational control system had similar degrees of sophistication, and when the strategic planning system and the management control system had similar degrees of sophistication. Mak (1989) implies that internal consistency may be more important than external fit. Koberg and Ungson (1987), in studying the relationships between perceived environmental uncertainty and

resource dependence upon organizational structure and performance, found organizational performance to be unrelated to the fit among these variables. Instead, only structure and resource dependence were related to performance for the organizations in the study. Keats and Hitt (1988) found, however, that external variables were significantly related to organizational characteristics and performance. Furthermore, they found more support for their "external control" model than they did for competing "strategic management" or "inertial" models (Keats & Hitt, 1988).

Interactions among Contextual and Structural Variables

The variables of size, technology, environment, and structure cannot be regarded as independent. In fact, numerous studies have related these variables to each other, making it illogical to assume independence. Moderating effects are certain to exist, as supported in the research literature. For example, environmental scarcity moderates the relationship between technology and structure (Yasai-Ardekani, 1989). In conditions of environmental scarcity, routine and inflexible technologies are associated with more mechanistic structures; under conditions of munificence the need to protect core technologies decreases, and more flexible structures can exist (Yasai-Ardekani, 1989). Environmental scarcity did not influence the relationship between size and structure, however. Larger size led to greater structural complexity, formalization, and decentralization despite varying levels of environmental scarcity and munificence (Yasai-Ardekani, 1989).

In a meta-analysis utilizing data from over thirty organization contingency theory studies, Miller *et al.* (1991) found that the size of organizational subunits moderated the relationship between technology and structure. In larger units, increased routineness facilitated decentralization by improving the effectiveness of formalization and standardization as structural control mechanisms. In smaller units, increased routineness resulted in centralization of decision-making.

In a theoretical paper, Arogyaswamy and Byles (1987) suggested that the interaction of size and technology determines the use of bureaucratic versus cultural control. Large size coupled with pooled interdependence fit with bureaucratic control; large units with reciprocal interdependence are better suited to cultural control methods.

The third caveat recognizes that management control system choice may be more the result of a configuration of contextual and structural variables than a result of individual variables (Kraft, 1993; Child, 1972). This expectation is formally stated in Hypothesis 12.

Hypothesis 12a: The configuration of lower perceived environmental uncertainty, routine technology, large organizational subunit size, and a mechanistic structure will be associated with a bureaucratic control system.

Hypothesis 12b: The configuration of higher perceived environmental uncertainty, non-routine technology, small organizational subunit size, and an organic structure will be associated with a bureaucratic control system.

Summary

In this chapter the management control literature was examined and a comprehensive management control model (shown in Figure 5) was developed, along with hypothesis designed to test a major portion of the model. The comprehensive management control model incorporates three key organizational theory contingency factors which have frequently been related to structure—technology, size, and perceived environmental uncertainty—and predicts their relationships with bureaucratic and cultural control. The predicted relationship of structure and management control is also illustrated by the model. The model and its supporting hypotheses also examine the antecedents of the supervisory control methods of output control, behavior control, ritual control, and professional control; these have not all been examined in a single

study to date in the literature. The model and hypothesis also look at the relationship of management control to the outcomes of job satisfaction, organizational commitment, and perceived department performance, which are important outcomes variables in most organizational settings.

One strength of the comprehensive management control model is that it appears to be compatible with most other frameworks for examining management control. For example, some of the control methods, such as prices, contracts, and output control, are essentially cybernetic in nature; while other methods, such as behavior control, ritual control, and professional control, are more homeostatic. While the cybernetic versus homeostatic distinction is not directly illustrated by the comprehensive management control model, it is clearly compatible with it. Similarly, the choice of management control systems is illustrated as a primary focus of the sociological approach, while the outcomes resulting from management control system and method choices are often the focus of the human relations approach. While not expressly demonstrated by the comprehensive management control model, the sociological and human relations approaches are consistent with the predictions of the comprehensive management control model.

As mentioned earlier, the first purpose of this research is to develop an overall framework for the analysis of management control system choices and control methods in organizations. The model presented in this research is an attempt to accomplish this purpose. The second purpose of this research is to test a portion of this model; specifically, to test the relationship between the contextual factors of size, technology, and environment, along with structure, to control system and method choices, as presented in the management control model. Since these relationships have never been tested in a single study, the results should provide a meaningful contribution to management control theory. They should also be helpful to practitioners in determining the efficiency or effectiveness of management control choices, and the impact of these

choices on individual and group outcomes. The methodology for testing the model is presented in chapter 3.

CHAPTER III

METHODOLOGY

This chapter focuses on the methodological aspects of this study. There are three major sections of the chapter. First, issues relating to the setting and the sample for the study are presented, including the criteria for sample selection and the setting and sample used in this study. Second, the development of the study's instrumentation is described, including a description of each variable, the scales used to measure the variable, and the rationale for choosing existing scales or developing new scales for this study. Third, the methods used to analyze the data are presented.

Sample

This section describes the criteria for sample selection, followed by a description of the setting and the sample used in this study, and the rationale for choosing this particular setting and sample.

Criteria for Sample Selection

As developed, the hypotheses must be tested primarily at the departmental level of analysis, and secondarily at the individual level of analysis. The primary requirement for the sample, therefore, was to choose a sample and setting that appeared to have the characteristics necessary to provide high variation among departments for the primary study variables. In other words, an appropriate sample would have departments with variations in technological routineness, size, structure, and exposure to environmental uncertainty. The sample would also provide high

variation in the levels of education and professional training of employees, along with variations in task complexity. An appropriate sample, therefore, appeared to require organizations with a number of departments with vastly different types of employees from department to department, ranging from those performing routine, mundane work to those involved in highly specialized, nonroutine tasks or projects.

While variance among departments was desirable, variance at the organizational level was not, since it might prove to be a confounding factor. Therefore a single industry in a single city was chosen for the sample, reducing industry-specific and geographical confounds, but also limiting generalizability of the findings.

Setting

The choice was made to conduct this research in two large hospitals in a medium-sized Midwestern city. In making this choice, several factors were considered. The first consideration was the choice of conducting a field study versus a laboratory study. The choice of a field setting considers the tradeoff between the potentially high internal validity but low generalizability and less realistic context of a laboratory study, and the potentially high external validity and realistic context but low internal reliability of a field study (McGrath, Martin, & Kulka, 1982). Given the exploratory focus of this research, in which the purpose is to test a newly-developed model of management control in organizations, the realistic context and high external validity provided by a field study was preferred.

The second methodological consideration was the obtaining of a setting that was likely to provide sufficient diversity among departments within organizations in a single industry. A single-industry study is preferred to reduce the number of potentially confounding factors; yet, diversity of departments within an organization is necessary to analyze different management control systems and methods. This

required identifying an organization in which both bureaucratic and cultural controls were likely to exist. Furthermore, to test the hypotheses, it was necessary to obtain a setting in which there was the likelihood of observing both types of bureaucratic control—behavioral and output—as well as both types of cultural control—clan and professional—to test the hypotheses adequately. Hospitals appear to provide a good example of such an organizational type. Hospitals contain a variety of groups and individuals, with social systems that include status differences (such as between physicians and nurses), highly-dependent clients, time pressures, and bureaucratic procedures (Chisolm & Ziegenfuss, 1986).

Hospitals also provide a good sample for this research because of the variation in context variables among hospital departments. Technology varies both within and among organizations. Hospitals require both flexible and adaptive systems (for less predictable situations) as well as more rigidly-defined structures for communication and management control in more routine circumstances (Chisholm & Ziegenfuss, 1986). Hospitals also exhibit an increasing range of environmental variation. A generation ago, hospitals operated in a relatively certain environment characterized by gradual change (Alexander, 1991). In the last decade, however, this relatively placid environment has become more turbulent. A number of changes occurred in a relatively short time period, including revision of hospital cost structures and reimbursement policies (Becker, 1990), increased competition from alternative health-care providers (Goldsmith, 1981), and rapid technological changes (Kimberly & Zajac, 1985). The AIDS crisis continues to cause major changes in health-care delivery, and is increasingly a source of work-related stress (George, Reed, Ballard, Colin, & Fielding, 1991) and, in some cases, physician withdrawal (Dansky, Greenberger, Strasser, & Dansky, 1990). Because the impact of these changes has varied from hospital to hospital and among departments within hospitals, this setting should provide for a variety of perceptions of the work environment.

Sample

The two levels of analysis for this study—departmental and individual—required obtaining data from both department heads and their employees, as well as some organization-level data. The majority of the variables included in the study were measured at the departmental level, including the contextual and structural factors, the type of management control system, and the supervisory control method antecedents. Also measured at the departmental level was the outcome variable of performance. The type of supervisory control method and the outcome variables of job satisfaction and organizational commitment were measured at the individual level.

Several of the variables were best operationalized at the department level of analysis. For example, researchers have shown that the relationship of technology with performance emerges most fully when technology is measured at the group or department level (Comstock & Scott, 1977; David *et al.*, 1989; Ford & Slocum, 1977; Lynch, 1974; Van de Ven *et al.*, 1976). This is due to variation in technology from department to department. While there may be a technological paradigm for an entire organization, it is likely that, at the least, variations of the paradigm will appear within subgroups of the organization. Therefore, the variation of technology may be captured most completely at the departmental level.

Two hospitals were included in the study. Hospital One was a full-service hospital located in a suburban area. It had 257 full-time equivalent employees, 66 inpatient beds, and an average inpatient census of 32.43 patients at the time data was gathered. In terms of organizational units, the hospital had 33 departments with one or more full-time employees. Department sizes ranged from one to 27 FTEs. From 1991 to 1992, the hospital's revenues had increased 14.08%; from 1990 to 1991, its revenues increased 6.27%, and from 1989 to 1990, revenues increased 35.94%.

The second hospital was a children's hospital specializing in the areas of mental health and genetics, and included a large number of research personnel. It employed 425 FTEs, had 106 inpatient beds, and had an average inpatient census of 65 patients at the time of data collection. From 1991 to 1992, the hospital's revenues had increased 12%; from 1990 to 1991, its revenues increased 22%, and from 1989 to 1990, revenues increased 7.33%. The hospital had 59 departments, ranging from one to 28 employees in size.

Measures

The following sections present the variables measured in the study, the instrumentation used for the measurement, and the rationale for choices between existing scales and the development of new scales. Existing scales with reliability and validity evidence were used whenever possible. In cases where existing scales were either unsuitable or unavailable, new scales were developed and pre-tested. Table 5 lists measures for each variable, the sources for each measure, and the internal reliability of existing measures as reported in previous studies. Scales for each measure are presented in the text in the section which explains that measure. The complete questionnaires are presented in the appendixes.

There are six sets of variables measured in this study. Of these, three sets are considered to be independent variables, and three sets of variables are considered to be dependent variables. The independent variables are presented first, followed by the dependent variables.

Independent Variables

The three sets of independent variables in this study include: context and structure factors, control method antecedents, and demographic variables.

TABLE 5

SOURCES AND RELIABILITIES OF MEASURES

Measure	Source(s)	Previous Reliability
Technology	Withey, Daft, & Cooper, 1983	
Exceptions		.81
Analyzability		.85
Environmental Uncertainty		
State Certainty	Gerloff, Muir, & Bodenstein, 1991	.84
Effect Certainty	Newly-developed	
Response Certainty	Milliken, 1990	.75
Dynamism/Complexity	Newly-developed	
Munificence	Keats & Hitt, 1988	.82
	Yasai-Ardekani, 1989	
	Newly-developed	
Structure	Bourgeois *et. al*, 1978	
	Meadows, 1980	.89
	Zanzi, 1987	.68
Bureaucratic Control	Newly-developed	
Cultural Control	Newly-developed	
Community		
Rules & Paperwork		
Task Complexity	Billings, Klimoski, & Breaugh, 1977	
	Ouchi & Maguire, 1975	
Input Uncertainty		
Variety/Unpredictability	Glisson, 1978	.69
Intensity of Worker/ Client Relationship	Newly-developed	
Output Measures		
Availability	Ouchi & Maguire, 1975	
Cost	Newly-developed	
Source of Shared Meanings & Values	Newly-developed	
Superiors		
Co-workers		
Professional colleagues		
Outside professionals		
Goal Congruence	Newly-developed	12
Actual/Perceived		
Actual/Actual		
Perceived/Perceived		
Supervisory Control Method		
Output Control	Newly-developed	
Behavior Control		
Professional Control		
Ritual Control		
Self-Control		
Department Performance	Koberg & Ungson, 1987 (adapted)	.64
	Newly-developed	
Job Satisfaction	Hackman & Oldham, 1976	.75
Organizational Commitment	Mowday, Steers, & Porter, 1979	.90
Reasons for Rules	Newly-developed	
Confidence in Management		

Context Factors and Structure

Hypothetically, the choice of management control systems is influenced by contextual and structural variables which operate primarily at the departmental level. The hypotheses state that technology, size, environment, and structure are independent variables that lead to the choice of either bureaucratic or cultural MCSs. Risk tolerance is hypothesized to be a possible moderating variable in these relationships.

Technology. Since the primary level of analysis in this research is the department level, the technology measure must focus on work-unit technology. As mentioned earlier, the relationship between technology and performance emerges more readily at the group or department level of analysis (David *et al.*, 1989; Ford & Slocum, 1977; Lynch, 1974; Van de Ven *et al.*, 1976). Comstock and Scott (1977) suggest that technological characteristics at the sub-unit level best predict the configuration of the management control system.

One widely-accepted conceptualization of work-unit technology is that of Perrow (1967, 1970). Perrow's technology construct has two dimensions: exceptions and analyzability. The exceptions dimension describes the frequency of unexpected events in the conversion process, and thus essentially is a measure of task variability. The analyzability dimension describes the ability to reduce the conversion process to discrete procedures or steps. Work that is less analyzable requires more judgment and intuition than work that is more analyzable. Perrow (1967, 1970) combined these two dimensions in a two-by-two matrix to describe four types of technology: routine, craft, engineering, and nonroutine. Routine technologies are both highly analyzable and have few exceptions. An example is a production process using an assembly line. In a hospital, housekeeping might be an example of a routine technology. Craft technologies are characterized by being difficult to analyze, yet having few exceptions. Examples of craft technology include the art of the maker of fine glassware, and the

work of a psychiatrist (Withey, Daft, & Cooper, 1983). In a hospital, much of the work performed by the physicians could be classified as craft technology, as illustrated by the much-used but seldom considered phrase, "the practice of medicine." A physician often must spend much time in diagnosis (analysis) but little time in presciption (exceptions) once an accurate diagnosis is made. In other words, the treatment may be obvious, perhaps even standardized, once a diagnosis is made; the craft lies in the diagnosis. The third type of technology is engineering technology, which is analyzable, but has many exceptions. Civil engineering is a good example of this type of technology; in hospitals, much of the work of laboratory personnel could be categorized as engineering technology. Nonroutine technology is both difficult to analyze, and has many exceptions. In corporations, strategic planning is a nonroutine technology (Withey *et al.*, 1983); in hospitals, the jobs performed by emergency room personnel provide a good example of nonroutine technology.

Figure 7 diagrams these relationships, illustrating increased non-routineness along a diagonal from the lower left cell to the upper right cell of the framework. According to Miller *et al.* (1991), routineness appears to be a higher-order technology construct encompassing such variables as workflow integration, routinization, and production continuity, and thus has become the underlying construct for much of organization theory technology research.

Withey, Daft, and Cooper (1983), using scales from six technology studies (Daft & Macintosh, 1981; Glisson, 1978; Hage & Aiken, 1969; Lynch, 1974; Van de Ven & Ferry, 1980; Van de Ven & Delbecq, 1974) and the Job Characteristics Inventory task variety index (Sims, Szilagyi, & Keller, 1976), developed an improved technology measure that will be used as the technology measure in this study. Withey *et al.* (1983) developed the measure by administering a questionnaire composed of all scale items from the six above-mentioned studies to employees and supervisors of work units that were expected to vary on the exceptions and analyzability dimensions

	EXCEPTIONS	
ANALYZABILITY	**Few**	**Many**
Unanalyzable	**CRAFT TECHNOLOGY** • *fine glassware* • *psychiatry*	***nonroutine*** **NONROUTINE TECHNOLOGY** • *research* • *strategic planning*
Analyzable	**ROUTINE TECHNOLOGY** • *assembly line* • *tonnage steel mill* ***routine***	**ENGINEERING TECHNOLOGY** • *made-to-order machines* • *civil engineering*

Withey, M., Daft, R.L., & Cooper, W.H. (1983). Measures of Perrow's work unit technology: An empirical assessment and a new scale. *Academy of Management Journal*, 26 (1), 45-63.

Figure 7. Work-unit technology using Perrow's technology dimensions

of Perrow's framework. Convergent and discriminant validity of the technology scales were tested using a multitrait-multimethod correlation matrix and factor analysis. Responses were compared with those of outside expert judges in an attempt to assess external validity. Discrimination among differing work-unit technologies was tested using analysis of variance and covariance. The items that best reflected Perrow's technology concepts and differentiated between work units were then selected to form two new, five-item scales. According to Withey *et al.* (1983: 58), the new scales "differentiate among work units somewhat better than most of the existing scales." These scales measured the exceptions and analyzability dimensions with internal reliability coefficients of $r = .81$ and $r = .85$, respectively, which was higher than the six existing scales. Seven-point Likert scales are used for scoring the items, with 1 = to a small extent, and 7 = to a great extent, for all except the first item, which is scored with 1 = very few, and 7 = most of them. Following are the items that comprise the two scales.

Exceptions

1. How many of these tasks are the same from day-to-day?
2. To what extent would you say your work is routine?
3. People in this unit do about the same job in the same way most of the time.
4. Basically, unit members perform repetitive activities in doing their jobs.
5. How repetitious are your duties?

Analyzability

1. To what extent is there a clearly known way to do the major types of work you normally encounter?
2. To what extent is there a clearly defined body of knowledge of subject matter which can guide you in doing your work?

3. To what extent is there an understandable sequence of steps that can be followed in doing your work?

4. To do your work, to what extent can you actually rely on established procedures and practices?

5. To what extent is there an understandable sequence of steps that can be followed in carrying out your work?

Department Size. The most commonly used measure of organization or department size is the number of full-time employees or full-time equivalent (FTE) employees in an organization (Blau & Schoenherr, 1971; Price & Mueller, 1986). The number of employees is commonly used in studies relating size and structure or management control, since it is people who are being organized (Child, 1973b). Other indicators attempt to incorporate the scope of the organization's responsibilities by measuring the number of hospital beds, number of students, sales volume, or assets (Price & Mueller, 1986). These measures are frequently highly correlated, and can often be used as substitutes for each other. For example, Pugh *et al.* (1969) found that size as measured by number of employees and as measured by net assets employed correlated at $r = .78$. The logarithm of size as measured by number of employees correlated with net assets employed at $r = .81$. The Pugh study was one of several that concluded that organization size was more effectively measured using the logarithm of number of employees rather than the actual number of employees (Carter & Keon, 1986; Child, 1973b). The better fit that results from using the logarithm of size indicates that the relationships between size and structure vary according to the size of the organization: small organizations are more sensitive to changes in size than are large organizations (Kimberly, 1976; Yasai-Ardekani, 1989). Care must be taken, however, to avoid the assumption that all measures of size are equivalent, since the use of varying size measures has been shown to differentially affect research outcomes (Gooding & Wagner, 1985).

In this study, size is measured at two different levels of analysis: department and individual. The crucial level of analysis, as mentioned earlier, is the departmental level. The number of full-time or full-time equivalent (FTE) employees, therefore, provides a straightforward measure of the size of a department. This data is obtained both from the Human Resource Management (HRM) department of the organization, and from a self-report measure administered to each department head.

A measure of the size of the organization must also be obtained as a control variable. Three different indicators, which should be highly correlated, are used. The first is the FTE. The second is a capacity measure: the number of hospital beds. The third is a capacity utilization measure: the average hospital census for the previous three months. While both logic and previous research imply that these indicators should be highly correlated, the relative accessibility of this data argues for obtaining and comparing these measures.

Environment. Dess and Beard (1984), using a factor-analytic approach, concluded that environmental uncertainty is not a unidimensional construct, but can be characterized by three dimensions: munificence, dynamism, and complexity. Munificence refers to the availability of environmental resources to support growth, and has been measured at the industry level using the average growth in net sales and operating income over time (Keats & Hitt, 1988). Dynamism refers to environmental instability or volatility. Keats and Hitt (1988) used variability in net sales and operating income to measure this dimension. Complexity involves the number, diversity, and distribution of task-environment elements. A macro measure suitable for measuring complexity is a measure of dynamic industry concentration (Keats & Hitt, 1988).

Wholey and Brittain (1989) criticized many typical measures of environmental variation, contending that most measures do not distinguish adequately between the frequency, amplitude, and predictability of environmental variation. These three

variables may actually be independent dimensions of the environmental variation construct. If Wholey and Brittain are correct, then environmental variation must be measured by its characteristics over time, and not by managerial perceptions of these characteristics. Many authors, however, contend that managers' perceptions of environmental variation are more important that the actual change, in that the responses of managers to changes in the environment are based on their perceptions of environmental variation rather than on actual changes (e.g. Cameron & Zammuto, 1983; Milliken, 1987; Yasai-Ardekani, 1989). If this is the case, it would not be necessary to measure environmental variation objectively, nor to specifically measure the frequency, amplitude, and predictability dimensions.

Milliken (1987) asserts that the environmental uncertainty construct encompasses three different dimensions: (1) *state uncertainty*, which is uncertainty about the state of a particular component of the environment; (2) *effect uncertainty*, which relates to the ability or inability to predict the impact of environmental changes on the organization; and (3) *response uncertainty*, which relates to the ability or inability to predict the consequences of a particular response to the environment. Her subsequent research (Milliken, 1990) tends to confirm the existence of these dimensions. Milliken, however, operationalized environmental uncertainty at the organization level. This makes adaptation of her measures to a departmental level somewhat difficult.

The level at which environmental uncertainty is measured is important. The distinction between actual and perceived environmental uncertainty plays an important role in the development of uncertainty measures. If objective uncertainty has deterministic effects on an organization, then objective uncertainty should be used for measurement. When a study is interested in measuring environmental uncertainty at a departmental level, however, this is only a partial solution. If decision-maker's perceptions of environmental variations are critical to a study, then the level of analysis

becomes less problematic. The expectations are that different department heads will have differing perceptions of the environment, as well as differing assessments of the impact of environmental change on the operations of their departments.

To summarize the issues involved in measuring environmental uncertainty, then, it appears that the challenge is in finding a departmental-level measure that effectively incorporates several factors. These include munificence, dynamism and complexity (Dess & Beard, 1984); and state, effect, and response uncertainty (Milliken, 1987, 1990). In this study, the various aspects of environmental uncertainty will be measured using five scales. These scales measure dynamism/complexity, state certainty, effect certainty, response certainty, and munificence.

Dynamism/Complexity

Dynamism measures the perceptions of organizational members concerning the volatility of their work environment. The following newly-developed measure uses items of potential uncertainty to workers in a health-care setting. Responses are on a seven-point scale, with 1 = Absolutely no effect, 7 = A great extent.

Over the coming year, to what extent do you expect changes in the following factors to effect the way in which you perform your job?

1. Increases in AIDS patients
2. Changes in technology
3. Increases in crime
4. Changes in the economy
5. Changes in hospital leadership
6. Changes in the patient census level
7. Personnel changes in the department
8. Force reductions

9. Changes in the hospital structure
10. Changes in government regulations
11. Changes in staff scheduling

State Certainty

Gerloff, Muir, and Bodenstein (1991) showed that Duncan's (1972) measure of perceived environmental uncertainty has three dimensions that correspond to Milliken's (1987) state, effect, and response certainty factors. In their study, these three factors explained 55 percent of the total variation in responses. The resulting five-item state certainty scale had a reliability of r = .84. Although Gerloff *et al.* (1991) used a five-point Likert scale, to maintain consistency with the other scales used in this study, a seven-point Likert scale is used, with responses ranging from 1 = never to 7 = always. In answering the items, respondents are asked to think of a critical incident or change that happened in the previous six months that required them to make a decision.

1. How often do you feel you have the information you need in order to understand how this factor will change in the future?
2. How often do you believe that the information you have about this factor is adequate for decision-making?
3. How often is it difficult for you to get the necessary information about this factor for decision-making?
4. How often is it difficult to obtain additional information about this factor when you need it for decision-making?
5. How difficult is it for you to predict which environmental factors and components will be important considerations in future decisions?

Effect Certainty

The internal reliability of the items from Duncan's (1972) measure of perceived environmental uncertainty that correspond to Milliken's (1987) effect certainty measure was a low r = .25 in the Gerloff *et al.* (1991) study; however, the authors

suggested wording changes to improve the scale's reliability. In the initial pretest conducted for this study, however, the reliability of the revised scale did not increase substantially. In addition, the Duncan (1972) measure, as adapted by Gerloff *et al.* (1991), was not conceptually equivalent with Milliken's (1987) definition of state certainty, in that the items attempted to assess the impact of a decision on the environment, rather than the impact of the environment on the decision-making process. It was deemed necessary, therefore, to revise the scale items to be conceptually consistent with Milliken's definition. The resulting scale has four items, each of which is scored on a seven-point Likert scale. The pre-test reliability of the scale was r = .89.

Think of a critical incident or change in the organization's environment that would require you to make a decision. In thinking about this factor:

1. How often do you feel that you are able to predict how this factor will affect decisions made by management? (1 = Never; 7 = Always)

2. How often can you predict the impact that this change will have on the success or failure of your work? (1 = Never; 7 = Always)

3. How sure are you that this change will affect the success or failure of your work? (1 = Unsure; 7 = Sure)

4. Before a decision is made, how sure are you of the affect this change will have on the decision? (1 = Unsure; 7 = Sure)

Response Certainty

To measure response certainty, the wording of Milliken's (1990) scale was modified to make the items more applicable to a variety of change-related circumstances. Rather than requiring the respondent to identify a specific job-related trend, the revised wording refers more generically to job-related changes. Milliken's (1990) original scale had an internal reliability of r = .75. Responses are on a 7-point scale, with 1 = strongly disagree, 7 = strongly agree.

1. When weighing the various alternatives for responding to change, it is difficult to decide which of these alternatives is likely to be most effective in the long run.

2. I cannot accurately assess the relative effectiveness of various alternatives because there are so many unknowns that can influence the effectiveness of each alternative.

3. In the face of these changes, to some extent I will just have to guess which strategy will produce the most desirable outcome for my department.

4. It is difficult to determine exactly what alternatives are available for responding to these changes.

Munificence

Dess and Beard (1984) suggest that the key factor in environmental munificence is market growth. Consistent with that concept, Yasai-Ardekani (1989) used the rate of change of demand for the industry's products and service as a measure of environmental munificence or scarcity. Similarly, Keats and Hitt (1988) used the average growth in (1) net sales and (2) operating income in the industry. In their study, these measures correlated at r = .70.

The difficulty in using these measures is that they have only a limited application to the departmental level of an organization. Environmental munificence or scarcity rarely affects all departments within an organization evenly. From a decision-making perspective, the perceptions of each department head as to the effects of munificence or scarcity on his or her department are probably the most significant. Therefore, it seems reasonable to obtain objective measures of munificence at two levels—industry and organizational—as well as subjective measures at the departmental level. Therefore, the rate of change in revenues for the industry and the hospital will be gathered, and the following items will be used to obtain the perceptions of munificence by department heads:

1. *As a department head, how would you rate the availability of the following resources for accomplishing departmental objectives?*

(1 = very inadequate, 7 = very adequate)

a. staff
b. medical equipment
c. computer equipment
d. space
e. funding for staff pay increases
f. funding for other departmental needs

2. *How would you describe the trend in obtaining resources?*

(1 = obtaining resources is becoming much more difficult all the time,
7 = it is becoming much easier to obtain needed resources)

Structure. Burns and Stalker's (1961) conceptualization of organic versus mechanistic structure offers the most widely researched framework for assessing organization structure. According to House and Rizzo (1972), organic organizations tend to have the following characteristics: loose, less-hierarchical structures; open, multi-directional communication; shared and unprogrammed problem-solving and decision-making; implicit role definitions; professionally-oriented personnel; and a high degree of trust and openness. In contrast, mechanistic organizations tend to have hierarchical structures, top-down communication, programmed decision-making, explicit roles and job descriptions, personnel with institutional loyalty and orientation, and low trust among organizational members.

The characteristics of organic versus mechanistic structures set forth in Burns and Stalker (1961), House and Rizzo (1972), and Meadows (1980) that relate to the structure of work groups can be arranged into four categories: nature of the structural hierarchy, communication patterns, decision-making authority, and the source of role definitions. With these four categories in mind, items from questionnaires developed by Bourgeois *et al.*, (1978), Meadows (1980), and Zanzi (1987) were analyzed to determine which items best measured these properties of organic and mechanistic structures. The items are presented below, with the factor that the item measures in

italics preceding the item (organic characteristics = O, mechanistic characteristics = M). The first nine items were adapted from an instrument developed by Bourgeois *et al.*, (1978). Responses were scored using a five-point bi-polar scale, and scores for the items were summed to form the total score. While reliabilities for the scale were not published, the items selected for this study appeared to exhibit acceptable face validity, in that they meshed closely with descriptions of the organic-mechanistic structure construct as defined by Burns and Stalker (1961) and House and Rizzo (1972). The internal reliability of these nine items in the pretest was r = .74; the entire fifteen-item scale exhibited a reliability of r = .83.

1. *Communication*
   (M) Most communication written and distributed
   (O) Little written communication

2. *Communication*
   (M) Communication is expected to follow official channels
   (O) There is freedom to communicate across organizational lines at any time

3. *Decision-making*
   (M) All orders must come from management
   (O) Lower-level employees are free to use their own initiative

4. *Nature of the hierarchy*
   (M) Superiors and employees have large rank differences
   (O) Superiors and employees have only slight rank differences

5. *Role definitions*
   (M) Individual jobs are clearly defined
   (O) Individual jobs are not clearly defined

6. *Role definitions*
   (M) Duties never cross departmental lines
   (O) Duties frequently cross departmental lines

7. *Nature of the hierarchy*: Our organization's structure:
   (M) Is tall and narrow
   (O) Is flat and wide

8. *Decision-making*: Decision-making authority:
   (M) Is based on managerial position
   (O) Is based on expertise

9. *Decision-making*: Major strategic decisions:
   (M) Are made by top management
   (O) Are made by the departments affected by the decision

The following two items were taken from an eight-item bi-polar scale developed by Zanzi (1987). To avoid unnecessary duplication, items that were conceptually identical to those already chosen above were not selected. In addition, items with unacceptable inter-item correlations were not selected. Based on these selection criteria, only two of Zanzi's items appeared to add any power to the organic/mechanistic structure measure.

10. *Role definitions*: In your work group:
    (M) The lines of authority are precisely defined
    (O) The lines of authority are not precisely defined

11. *Communication*
    (M) Communication concerning job-related matters moves vertically, up and down the organization
    (O) Communication concerning job-related matters goes in all directions

The last four items for measuring organic/mechanistic structure were adapted from a nine-item scale by Meadows (1980). These four items reflect seven of the nine items in the original scale. As with the Zanzi (1987) measure, only non-redundant items with good inter-item correlations were chosen. Meadows' (1980) nine items had acceptable reliability ($r = .89$). While Meadows scored the items using a five-point Likert scale, the nature of the responses appears to be more suited to bi-polar scaling.

12. *Communication*: When working on a job or project:
    (M) I interact mainly with my supervisor
    (O) I interact with people other than my supervisor

13. *Communication*: When my supervisor talks to me, most of his/her communication is:
    (M) Orders and instructions
    (O) Information and advice

14. *Decision-Making*
    (M) My supervisor decides what the workgroup should do
    (O) The workgroup decides what the workgroup should do

15. *Role definition*: When your workgroup begins a new job or project:
    (M) Each individual has a predefined role to play
    (O) Roles are negotiated

Control Method Antecedents

Several variables have been hypothesized to affect the choice of supervisory control method. These include task complexity, input uncertainty, cost and availability of output measures, availability of professional employees, the source of shared meanings and values, and goal congruence. In the following sections, the measures for each of these variables are presented.

Task complexity. Task complexity is a higher-order construct incorporating variables such as task interdependence and the learning curve for the task. In this study, therefore, task characteristics such as task interdependence, training time, and understandability are grouped together in a measure of task complexity. Six items are used to measure task complexity. The first five are taken from a study by Billings, Klimoski, and Breaugh (1977); the last item is from Ouchi and Maguire (1975). The first two items measure job complexity. Items 3, 4, and 5 measure task interdependence, in that greater task interdependence tends to increase task complexity (Lawrence & Lorsch, 1967; Ouchi & Maguire, 1975). Item 6 measures training times, since jobs which require less time to learn are typically less complex. All items are scored using seven-point Likert scales; except as noted, 1 = strongly disagree, and 7 = strongly agree.

1. Because of the way my job is, I must often think about what I'm doing.
2. My job would be easy for someone to learn (reverse-scored).
3. My job performance depends on how well others do their jobs.
4. I have to talk to other workers to get my job done.
5. After I work on something, I must give it to someone else before it is finished.
6. How long do you think it would take for an inexperienced person to learn the basics necessary to handling your job?
   (1 = one week or less, 7 = more than one year)

Input uncertainty. Input uncertainty measures the client-related uncertainties often experienced in service organizations. Input uncertainty is based both on the variety and unpredictability of client inputs, and to the intensity of the client relationship (Trevino, 1986). Since the sample is composed of hospitals, it is important to measure the amount of client-related input uncertainty.

Trevino (1986) suggested that the variety and unpredictability of client inputs is high when many diverse clients interact with the organization, and the exact nature of client cannot be easily predicted. High variety and unpredictability makes developing exact rules for handling each client difficult, due to the nonroutine nature of the client inputs. A measure of this variable was developed by Glisson (1978). Glisson referred to the variable as technological routinization in service industries, but the focus of the items is on the variety and unpredictability of client inputs and the resulting effects on customer-service technology. The reliability of Glisson's (1978) six-item scale was $r = .69$. In accordance with pretest results, two of Glisson's items were deleted from the scale. Glisson used five-point Likert scales for scoring, with 1 = Never, to 5 = Always; however, in keeping with the other measures presented here, a seven-point Likert scale will be used for this study. The four items are as follows:

1. To what extent are the decisions you make in working with clients or patients dissimilar from one day to the next?

2. Think of all the kinds of events which affect your work with clients or patients. How often would you say you are able to anticipate and predict the nature of those events?

3. Many jobs require the use of searching procedures of one kind or another in solving client or patient problems. To what extent are the searching procedures you use dissimilar from one day to the next?

4. How often do you meet clients or patients with problems you have never encountered before?

Items used to measure the second factor, intensity of the worker/client relationship, were developed for this study based on Trevino's (1986) definition of this variable. Intensity of the worker/client relationship is affected by the amount of time spent working with clients, and by the nature of the worker/client interaction. The following six items incorporate these factors into a measure of the intensity of the worker/client relationship. The pretest results indicated an internal reliability of $r = .72$. Respondents are asked to provide a percentage for the first item; the remaining five items are scored on a seven-point Likert scale, with 1 = strongly disagree, and 7 = strongly agree.

1. What percentage of your work time do you spend in contact with clients or patients?

2. The time that I spend working with clients or patients is the most challenging part of my job.

3. Responding to the needs of clients or patients is very demanding.

4. I seldom find my work with clients or patients to be challenging.

5. My interactions with clients or patients often become intense.

6. I rarely find working with clients or patients to be difficult.

Cost and availability of output measures. For output control to be used, output records must be available at a reasonable cost to the organization. If output

controls are not available, it may be the result of a production/service process that cannot be easily measured, or because the costs of output measures are prohibitive. In either case, behavioral control becomes more likely.

To measure availability of output measures, the following items were adapted from Ouchi and Maguire (1975). The wording was changed to make the items relevant to workers in health-care organizations since Ouchi and Maguire's (1975) questionnaire was specifically targeted to retail department store employees.

> *Employees*: In some organizations, records are kept for each employee that show his or her output—for example, number of tests processed, number of clients served, etc. Do you or your immediate supervisor keep such records of your individual output?
>
> *Supervisors*: In some organizations, records are kept for each employee that show his or her output—for example, number of tests processed, number of clients served, etc. As a supervisor, do you have access to such records of your employees' individual output?

Several reasons for not keeping output records may exist, including cost factors, effort factors, or measurability problems. The following questions, newly-developed for this study, were designed to ascertain why output records are not kept by a department.

> *To what extent does each of the following items explain why records of each employee's output are not kept?*
>
> 1. My employees are involved in group tasks where individual outputs are not easily distinguished
> 2. Individual output records could be kept, but doing so would require too much paperwork
> 3. Individual output records could be kept, but the cost of doing so outweighs the benefits of keeping such records
> 4. The variety of tasks that must be performed by my employees is such that, even if I kept records of their outputs, the records would be meaningless.

5. The output of my employees is simply not measurable in a concrete manner.

Availability of professional employees. As hypothesized in Chapter 2, the use of professional control methods requires professional employees with values that are sufficiently congruent with those of the organization. If professionals with the requisite values are not available in the quantity necessary, then professional control is not a viable option. To measure the availability of professional employees, the input of the human resources management (HRM) department of the hospital was needed. A professional employee was defined as any employee who: (1) is not an hourly employee, (2) is classified as exempt, and (3) is professionally certified. A list of job categories was compiled based on job titles provided by survey respondents, and then HRM staff members were asked to estimate the hospital's ability to recruit qualified professionals in each job category, by answering the following questions:

1. For each position that you are seeking to fill in this area, how many qualified applicants do you receive, on the average?

2. The supply of qualified applicants for positions in this area has been:
   1 = decreasing rapidly
   4 = remaining constant
   7 = increasing rapidly

3. The compensation of new hires in this area has been:
   1 = decreasing rapidly
   4 = remaining constant
   7 = increasing rapidly

Source of shared meanings and values. As hypothesized in Chapter Two, the source of shared meanings and values determines the specific type of supervisory control method used in a cultural management control system. In professional control, the source of shared meanings and values is external to the organization, in that these values have been internalized by the professional, and brought with him or her to the organization. In ritual control, the organization, and particularly groups of co-workers, socialize the worker into the system of shared meanings and values.

There are at least four sources from which hospital employees can learn how to perform their jobs, find answers to questions or problems, and use as models for their own work-related behavior. These include supervisors, co-workers who also belong to the same profession, co-workers who do not belong to the same profession, and professionals outside the organization. These sources are not mutually exclusive, in that a worker may receive work-related behavior information from any or all of these sources. When such information is provided by supervisors, it may indicate the use of bureaucratic control; when the information is provided by coworkers within the organization, it may indicate ritual control; and when the information is provided by professionals external to the organization, it may indicate professional control (Abernethy & Stoelwinder, 1991).

The following scales were developed to determine the origin of a worker's shared meanings and values. Responses were scored using a seven-point Likert scale, with 1 = to a small extent, and 7 = to a great extent.

1. To what extent does your knowledge about how to perform your job come from each of the following sources?
    a. Superiors
    b. Co-workers who are not members of your profession
    c. Co-workers who are members of your profession
    d. Members of your profession outside of the workplace
2. To what extent do you rely on each of the following groups for assistance when your have a job-related question or problem?
    a. Superiors
    b. Co-workers who are not members of your profession
    c. Co-workers who are members of your profession
    d. Members of your profession outside of the workplace

3. To what extent do you model your own work behavior after that of the following groups?

   a. Superiors

   b. Co-workers who are not members of your profession

   c. Co-workers who are members of your profession

   d. Members of your profession outside of the workplace

Goal congruence. In many micro-level studies, goal congruence is operationalized as agreement between a supervisor and subordinate on a single specified goal (e.g. Latham, Mitchell, & Dossett, 1978; Sherman, 1989). This operationalization is appropriate when one goal in a particular setting is of interest. When attempting to measure supervisor-subordinate goal congruence in multiple departments in multiple organizations, however, a more broad-based measure is needed, due to the lessened ability to accurately specify common goals from one department to another. For example, the goals of the housekeeping department should vary considerably from those of radiology, which will be different from the intensive care unit. In addition, when used in a hospital setting, the measure must be able to reflect the goal structure of a diverse, service-oriented organization.

The measure developed for this study takes into account individual perceptions of the level of importance of a wide variety of goals and values. The individual items were developed through a search of the organization theory literature to identify key goal areas. Those identified include goals concerning quantity of service, quality of service, productivity, safety, morale, belongingness/community, teamwork, openness of communication, and the value of human resources (Campbell, 1977); and goals relating to growth in size, growth in volume, innovation, and employee development (Daft, 1989). Responses were scored on a seven-point Likert-type scale, with 1 = not important at all, and 7 = very important. Employees were asked to rate how they personally felt about each goal, and to rate their perceptions of their supervisor's

feelings about each goal. Likewise, supervisors rated both themselves and their employees. The smaller the difference between the supervisor and a subordinate, the greater the goal congruence. The amount of goal congruence was measured by summing the absolute values of the differences between the supervisor's and subordinate's scores. A low value indicated high goal congruence, while a high value indicated high goal incongruence.

By asking respondents to rate both their own feelings about each goal and their perception of their supervisor's feelings about the importance of the goal, three measures of goal congruence were taken. In this study, the absolute value of the difference between the worker's rating of goals and the worker's rating of the supervisor's goals is referred to as type one goal congruence (actual/perceived). The absolute value of the worker's ratings as compared with the supervisor's actual ratings are referred to as type two goal congruence (actual/actual). The absolute value of the worker's perception of the supervisor's goals compared with the supervisor's perception of the worker's goals is referred to as type three goal congruence (perceived/perceived). Three measures of goal congruence were taken because the literature gives little direction as to the importance of perceived versus actual differences in goals between employees and supervisors, although a recent study by Furnham and Stringfield (1994) indicates high correlations among managers and employees on a variety of managerial skills such as innovation, motivation, and decision making. The items used to measure goal congruence follow.

1. Providing quality service.
2. Building relationships within this department.
3. Getting as much work done as possible.
4. Accomplishing work in a safe manner.
5. Maintaining high morale in this department.

6. Working together with department members.
7. Promoting open and honest communication.
8. Developing individual skills and abilities.
9. Building relationships with other departments.
10. Increasing the output of the department.
11. Increasing the size of the department.
12. Finding better ways to accomplish tasks.

Demographic Variables

Because individual demographic variables may moderate the relationships being studied, it is important to gather such data. The following section describes the demographic variables of interest in this study, and the rationale and method of measurement for each of these variables.

Education and training. Several demographic variables are valuable in ascertaining the status of professionals in the organization. According to Miller (1967), the number of years of professional training is an important indicator of professional versus non-professional status. The highest degree obtained is also a key indicator of professional status. The number of years spent in the profession provides a measure of the extent of professional socialization.

Identification with the organization. The length of service with the organization may be related to organizational commitment and to the extent of organizational socialization. The time in the current position may also relate to the extent of socialization into the department. The number of positions held with the organization provides insights into mobility and into knowledge of the operations of the organization.

Work status. In health care organizations, work status can be important. Distinctions are possible between full-time, part-time, and volunteer workers. Significant differences may also exist between those who work different shifts or rotations. Because many health-care professionals work for more than one organization, the number of organizations worked for may also be important.

Other demographic variables. Age is an important variable, since it has been shown to be related to the outcome variables of organizational commitment and job satisfaction. Age has specifically been shown to be related to increased job satisfaction of physicians (Burns, Andersen, & Shortell, 1990). While gender is not hypothesized to relate to any of the measures, its frequent importance as a moderating variable appears to warrant its inclusion. The percentage of total household income provided by the position may be related to organizational commitment.

Confounding Variables

Several potential confounding variables were also measured. Risk aversion might be a confounding variable in health care research in that the need to protect workers and organizations from the threat of malpractice litigation may confound hypothesized relationships in the management control model (Schwartz, 1990). A seven-item scale was used to measure risk aversion. Personal control was measured using a five-item scale. The supervisory control methods measured in this research—output control, behavior control, ritual control, and professional control—are external to the worker. Intrinsic personal controls have the potential to substitute for or confound extrinsic supervisory control methods.

Dependent Variables

There are three sets of dependent variables measured for this study. These are the type of management control system, the type of supervisory control method, and

three outcome variables: job satisfaction, department performance, and organizational commitment. These are presented in the following sections.

Type of Management Control System

Most of the literature comparing bureaucratic and cultural control is theoretical, therefore, no suitable scales were available for measurement. Because organizations and departments are likely to use a mixture of bureaucratic and cultural controls, scale items cannot be contrasted with each other, as in a bi-polar scale. Bureaucratic control can range from very low to very high, as can cultural control. It is possible for an organization or a subunit to exhibit very little management control; in this case, both bureaucratic and cultural control might be low. An organization or subunit also might be exhibiting very high levels of management control; in this case, both bureaucratic and cultural control might be very high. The scales for bureaucratic and cultural control, therefore, represent two continua.

Development of the scales was based on characteristics of bureaucratic and cultural management control systems presented in the literature. Bureaucratic management control sytems require much documentation such as rules, procedures, and written reports (Lorange & Scott Morton, 1974). Bureaucratic management control systems also tend make heavy use of plans and schedules (Daft, 1989). They rely on explicit, formal control (Baliga & Jaeger, 1984), and on close surveillance and direction of employees (Ouchi, 1979). Selection is based on having the right technical skills, or at least in having the technical background for specific technical skill training (Baliga & Jaeger, 1984). Monitoring is accomplished through either close supervision of behavior or through monitoring of performance against standards (Ouchi, 1980).

In contrast, cultural MCSs use little documentation (Lorange & Scott Morton, 1974), relying instead on implicit, informal means of management control (Baliga & Jaeger, 1984). These include traditions, shared ideas and values, and stories and

rituals. Individuals are chosen for their motivation toward the "right" objectives (Ouchi, 1979). Selection and socialization are very important. Selection is based on perceived ability to fit with the goals and objectives of the organization. Performance evaluation is "intimate". In other words, monitoring is accomplished through individual interactions (Baliga & Jaeger, 1984). A new worker may feel disoriented, in that it appears that experienced employees already know "the way things are done around here," but the new employee is provided with few, if any, written guidelines for expected behaviors or descriptions of cultural norms (Lorange & Scott Morton, 1974). Under cultural control, there is a sense of community, and a willingness to place organizational goals ahead of individual goals (Ouchi, 1980).

Bureaucratic control. These characteristics were used to develop the following measure of bureaucratic versus cultural MCSs. Supervisor items, where different, follow the subordinate items, and are in italics. All items were scored using a seven-point Likert scale, with 1 = Strongly disagree, and 7 = Strongly agree. Pretest results indicated an internal reliability of r = .76 for the bureaucratic control scale.

1. There are written rules or procedures for the tasks that I perform.
   (*There are written rules or procedures for the tasks that my employees perform*)

2. For most of the tasks that I perform, there is some sort of written documentation of my performance.
   (For most of the tasks that my employees perform, there is some sort of written documentation of their performance)

3. My supervisor closely monitors my performance.
   (I closely monitor the performance of my employees)

4. When a vacancy occurs in this department, there is an emphasis on hiring a person with the right technical skills.

5. The organization requires and emphasizes continued technical training.

6. Rules, regulations, and paperwork seem to be very important to the organization.

7. In this department, there is an emphasis on formal planning and scheduling.

8. Compared with other departments, we have a lot of paperwork.

Cultural control. Pretest results indicated that the cultural control items loaded onto two distinct factors, which can be designated as "feelings of community" and "rules and paperwork." Four pretest items loaded onto the first factor, with an internal reliability of r = .69.

1. When a vacancy occurs in this department, there is an emphasis on hiring a person who is compatible with the personnel and the goals of the department.

2. Most people that work in this department view work-related issues in similar ways.

3. People in this department work together to get things done.

4. There is a strong sense of community and belongingness in this department.

To augment these four items, three additional items were adapted from Jones' (1986) measures of socialization. Items were chosen for their face validity, and were reworded to reflect a departmental level of analysis.

5. When I began working in this department, my colleagues went out of their way to help me understand how things are done here.

6. Experienced department members see advising or training new workers as one of their most important responsibilities.

7. When I began working in this department, I gained a clearer understanding of my role by observing my fellow workers.

The second factor considers the amount of rules and paperwork, which should be less prevalent under a cultural MCS. The following four items had an internal reliability of r = .73.

1. Compared with other departments, we have very few rules.

2. Compared with other departments, we have very little paperwork.

3. Rules, regulations, and paperwork seem to be very important in this department (reverse-scored).

4. Keeping detailed and accurate records is very important in this department (reverse-scored).

Type of Supervisory Control Method

This section presents the measures for the four SCM's examined in this study: output, behavior, professional, and ritual control. The definitions of output, behavior, and ritual control, as described by Ouchi and Maguire (1975) and Ouchi (1977, 1979), along with descriptions of professionalism (Hall, 1968), were used to develop a twenty-item instrument for measuring the type of SCM. Five items were used to measure each of the four SCM's. The instrument is presented following a description of each type of SCM and the development of the items used to measure that type of supervisory control.

Output control. Output control is dependent on the availability and use of output records. Respondents were asked to what extent specific quantity of output measures were used in assessing their work performance, helping them to be aware of problems with work performance, helping them to know when they have done a good job, and establishing the standards by which their performance is judged.

Behavioral control. Behavioral control is dependent on supervision of work behaviors. Respondents were asked to what extent observation and ratings of their work behavior were used in assessing work performance, helping them to be aware of problems with work performance, and helping them to know when they have done a good job. Respondents were also asked to what extent their immediate supervisor was able to accurately assess their work performance.

Professional control. Hall's (1968) professional model differentiates between two groups of characteristics of professionalization: structural characteristics and

attitudinal characteristics. The structural characteristics include formal educational and entrance requirements, the availability of professional organizations, and the existence of a formal code of ethics for members of the profession (Hall, 1968). The attitudinal characteristics are rooted in a sense of professional autonomy, and describe the manner in which professionals view their work. According to Hall, there are five attributes of a professional attitude: (1) the use of the professional organization as a major reference; (2) a belief in service to the public, including the beliefs that the profession is indispensable and that professional work benefits both the provider and the recipient; (3) a belief in self-regulation, or peer review and control; (4) a sense of calling to the field, including the feeling that the professional would probably continue to perform his or her duties even if extrinsic rewards were reduced; and (5) a feeling of autonomy, in which the professional believes that he or she should be able to make work-related decisions without external pressures from the organization or clients, and that only members of the profession have the right to provide external pressure (Hall, 1968).

These characteristics relate to the concept of professional control, which exists when there is a body of shared meanings and values external to the organization that regulates the behavior of certain organizational members. When workers look primarily to their professional training for appraisal of job performance, rather than to co-workers or supervisors, professional control is in operation. In the measure, respondents were asked to what extent peer review of their work behavior is used in assessing work performance. Scale items also assessed the extent to which observation of their work performance by professional colleagues helped the respondents to be aware of problems with work performance, or helped them to know when they had done a good job. Respondents were also asked to what extent written or unwritten standards of a professional group of which they were a member influenced or established the standards by which their performance was judged.

Ritual/Clan control. Unlike professional control, ritual control depends on co-workers within the organization as the primary means of ensuring goal accomplishment. Rather than using bureaucratic means to control the actions of organizational members, other organizational members who are at the same level of the organization provide control and monitoring information. Both the informal and formal socialization processes help the worker to understand the way in which things are done in that organization. In the following measure, respondents were asked to what extent observation of their work behavior by co-workers was used in assessing work performance, helping them to be aware of problems with work performance, and helping them to know when they had done a good job. Respondents were also asked to what extent co-workers were able to accurately assess their work performance, and the extent to which unwritten standards communicated by co-workers were able to influence the standards by which performance was judged.

In the following measure, O = output control, B = behavior control, P = professional control, and R = ritual control. All items were scored using a seven-point Likert scale, with 1 = Not at all, and 7 = To a great extent. Wording changes for supervisor items are printed in italics.

1. To what extent is your immediate supervisor able to accurately assess your work performance? (B)
   (To what extent are you able to accurately assess the work performance of your employees?)

2. To what extent are co-workers in your department able to accurately assess your work performance? (R)
   (To what extent are co-workers in your department able to accurately assess the work performance of your employees?)

To what extent is your work performance (the work performance of your employees) *assessed by each of the following factors?*

1. Specific measures of the quantity of your (*their*) output (O)

2. Subjective ratings of your attitude by your supervisor (B)
   (Subjective ratings of their attitudes)

3. Subjective ratings of your work habits by your supervisor (B)
   (Subjective ratings of their work habits)

4. Peer review by *(their)* co-workers (R)

5. Peer review by *(their)* professional colleagues (P)

When there is a problem with your work performance (the work performance of a subordinate), *to what extent do each of the following factors help to make you aware of the problem?*

1. Specific records of the quantity of your *(their)* work (O)

2. Observation of your work behavior by a supervisor (B)
   (Observation of their work behavior)

3. Observation of your *(their)* work behavior by *(their)* co-workers (R)

4. Observation of your *(their)* work behavior by *(their)* professional colleagues (P)

To what extent does each of the following factors help you to know when you have (a subordinate has) *done a good job?*

1. Specific records of the quantity of your *(their)* work (O)

2. Observation of your work behavior by a supervisor (B)
   (Observation of their work behavior)

3. Observation of your *(their)* work behavior by co-workers (R)

4. Observation of your *(their)* work behavior by *(their)* professional colleagues (P)

To what extent do each of the following factors influence or establish the standards by which your performance (the performance of your employees) *is judged?*

1. Written standards for the quantity of your *(their)* output (O)

2. Written standards for the quality of your *(their)* output (O)

3. Unwritten standards communicated by *(their)* co-workers (R)

4. Written standards of a professional group of which you *(they)* are a member (P)

5. Unwritten standards of a professional group of which you *(they)* are a member (P)

Outcome Variables

The choice, use, and congruence of management control systems and supervisory control methods has been hypothesized to affect at least three outcome variables: performance, satisfaction, and commitment. The following section presents and discusses measures for each of these variables.

Performance

The performance of departments is one of the dependent variables of interest in this research. In hospitals, it is difficult to obtain an objective measure of the performance for some departments. Performance can be measured subjectively by obtaining the perceptions of higher-level managers about the performance of different departments. There are precedents for this method of measurement. For example, Koberg and Ungson (1987), in a study relating environmental uncertainty and dependence to organizational structure and performance, used managerial ratings (5-point Likert scale) of the overall ability of their staffs, along with the ability to maintain operating efficiency. These were combined with questions pertaining to turnover rates, employee morale, and interpersonal and interdepartmental relations (also using a 5-point Likert scales). The composite measure of performance showed acceptable internal reliability, with $r = .64$.

Performance was measured, therefore, using subjective ratings of various aspects of departmental performance by managers at the director level of the hospital. Although titles may vary, directors are normally those individuals one step below the

vice-president level, and usually have the oversight of broad functional areas of the organization. Directors rated the performance of each department in the study, using seven-point Likert scales, with 1 = to a small extent, and 7 = to a great extent. The final item, which measures overall performance, was rated on a scale of 1 = very poor to 7 = superior. The following six items were used to assess performance.

1. To what extent does this department meet its objectives?
2. To what extent does this department contribute to the organization?
3. To what extent does this department utilize resources effectively in meeting organizational goals?
4. To what extent does this department interact effectively with other areas of the organization?
5. To what extent does this department reach its potential?
6. On a scale of 1 to 7, with 1 = very poor and 7 = superior, how would you rate the overall performance of this department?

Satisfaction

Job satisfaction was measured with a five-item scale developed by Hackman and Oldham (1976). This scale has been used repeatedly in organization research. The internal reliability of this scale, as exhibited in the pretest, was r = .83. The five items are presented below.

1. Generally speaking, I am very satisfied with this position.
2. I often think about quitting (reverse-scored).
3. I am generally satisfied with the kind of work that I do in this position.
4. Most people that work here are very satisfied with their positions.
5. People in this organization often think of quitting (reverse-scored).

Commitment

Organizational commitment has been defined as "the relative strength of an individual's identification with and involvement in a particular organization," and has at least three related factors: (1) a belief in and acceptance of an organization's values, (2) a willingness to exert significant effort for the organization, and (3) an intention to continue membership in the organization (Mowday *et al.*, 1979: 226).

The Organizational Commitment Questionnaire (OCQ), developed by Mowday, Steers, and Porter (1979) is a fifteen-question survey with generally accepted reliability and validity. The original questionnaire's development consisted of a series of studies in nine different organizations, allowing the authors to satisfactorily establish internal and test-retest reliabilities, along with predictive, discriminant, and convergent validities. The OCQ has been used in multiple studies and a wide variety of settings, and has generally performed well. The OCQ has been used with employees of universities, hospitals, telephone companies, auto companies, and public agencies. It has also been used to measure the commitment of scientists, engineers, and psychiatric technicians (Porter, Steers, Mowday, & Boulian, 1974). All items were scored using a seven-point Likert scale, with 1 = Strongly disagree, and 7 = Strongly agree.

Listed below are a series of statements that represent possible feelings that individuals might have about the company or organization for which they work. With respect to your own feelings about this organization, please indicate the degree of your agreement or disagreement with each statement.

1. I am willing to put in a great deal of effort beyond that normally expected in order to help this organization to be successful.

2. I talk up this organization to my friends as a great organization to work for.

3. I feel very little loyalty to this organization (reverse-scored).

4. I would accept almost any type of job assignment in order to keep working for this organization.

5. I find that my values and the organization's values are very similar.

6. I am proud to tell others that I am part of this organization.

7. I could just as well be working for a different organization as long as the type of work was similar (reverse-scored).

8. This organization really inspires the very best in me in the way of job performance.

9. It would take very little change in my present circumstances to cause me to leave this organization (reverse-scored).

10. I am extremely glad that I chose this organization to work for over those I was considering at the time I joined.

11. There's not too much to be gained by sticking with this organization indefinitely (reverse-scored).

12. Often, I find it difficult to agree with this organization's policies on important matters relating to its employees (reverse-scored).

13. I really care about the fate of this organization.

14. For me, this is the best of all possible organizations for which to work.

15. Deciding to work for this organization was a definite mistake on my part (reverse-scored).

Methods of Analysis

Several items must be considered in the analysis of the questionnaire data. These include attempting to establish the reliability and validity of the measures used, testing the normality of the data, and testing each hypothesis. The following sections detail the appropriate methods for each of these areas, including the specific methods that were used to test each hypothesis.

Establishing Reliability and Validity

A pre-test was conducted to establish coefficients of internal reliability for all scales used in the study. The pretest results are reported in Table 6, along with reliability coefficients established in earlier studies. The reliability of all scales was also computed for the sample being studied. Confirmatory factor analysis was performed to assist in establishing the validity of all new scales. Pearson product-moment correlations were computed as a check on the intercorrelations of the scales and to ascertain potential multicollinearity problems.

Testing the Normality of the Data

Most statistical tests assume normal data. The normality of variable distributions was tested using the Kolmogorov-Smirnov one-sample test. This test is preferable to the Chi-square test because it is more powerful and can be used for small samples (Emory, 1985).

Testing Hypotheses

There are four groups of hypotheses: those that postulate a relationship between two variables, those that hypothesize effects by a moderating variable, those that test the congruence of the model, and those that predict that configurations of variables lead to certain outcomes. Hypotheses 1, 2, 4, and 5 fall into the first category; hypotheses 3, 6, 7, and 8 fall into the second category; hypotheses 9, 10, and 11 are in the third category; and hypothesis 12 is in the last category.

Several of the hypotheses have multiple parts; some of these test conflicting propositions found in the literature. In testing the hypotheses, therefore, each part of a hypothesis was evaluated independently of other sections, thereby treating each part of a multiple-part hypothesis as an individual hypothesis. Where there was more than one

TABLE 6

SOURCES AND PRE-TEST RELIABILITIES OF MEASURES

Measure	Source(s)	Previous Reliability	Pre-test # of Items	Pre-test Reliability
Technology	Withey, Daft, & Cooper, 1983			
Exceptions		.81	5	.89
Analyzability		.85	5	.89
Environmental Uncertainty				
State Certainty	Gerloff, Muir, & Bodenstein, 1991	.84	5	.59
Effect Certainty	Newly-developed		4	.89
Response Certainty	Milliken, 1990	.75	4	.64
Dynamism/Complexity	Newly-developed		9	.91
Munificence	Keats & Hitt, 1988	.82	2	
	Yasai-Ardekani, 1989		1	
	Newly-developed		2	
Structure	Bourgeois *et. al*, 1978		9	.83
	Meadows, 1980	.89		
	Zanzi, 1987	.68		
Bureaucratic Control	Newly-developed		8	.76
Cultural Control	Newly-developed		8	.61
Community				
Rules & Paperwork				
Task Complexity	Billings, Klimoski, & Breaugh, 1977		5	.64
	Ouchi & Maguire, 1975		1	
Input Uncertainty				
Variety/Unpredictability	Glisson, 1978	.69	4	.67
Intensity of Worker/ Client Relationship	Newly-developed		6	.72
Output Measures				
Availability	Ouchi & Maguire, 1975		1	
Cost	Newly-developed		5	
Source of Shared Meanings & Values	Newly-developed			
Superiors			4	
Co-workers			4	
Professional colleagues			4	
Outside professionals			4	
Goal Congruence	Newly-developed	.12		.75
Actual/Perceived				
Actual/Actual				
Perceived/Perceived				
Supervisory Control Method	Newly-developed			
Output Control			5	.93
Behavior Control			5	.83
Professional Control			5	.91
Ritual Control			5	.88
Self-Control				
Department Performance	Koberg & Ungson, 1987 (adapted)	.64	2	
	Newly-developed		4	
Job Satisfaction	Hackman & Oldham, 1976	.75	5	.83
Organizational Commitment	Mowday, Steers, & Porter, 1979	.90	15	.87
Reasons for Rules	Newly-developed			
Confidence in Management				

portion of an individual hypothesis, all portions must be supported for the hypothesis to be supported. If support is found for one portion but not another, the hypothesis was referred to as partially supported. If no portions were supported, the hypothesis was not supported.

In the following sections, the methodology for testing hypotheses in each of the above-mentioned four categories is examined.

Relationships between Two Variables

Hypotheses 1, 2, 4, and 5 test the relationships between two variables. The first test of the relationship between two continuous variables is the Pearson product-moment correlation. Scatterplots were examined to verify the nature of the correlation and to detect outliers that may affect the analysis. The second test was a linear regression model. Residual plots and the Durbin-Watson statistic were examined to detect violations of the assumptions of linear regression.

Where the dependent variable was a classification variable that could be treated as dichotomous and the independent variable was continuous, T-tests were used to test hypotheses (Emory, 1985). The F'-test was examined to test the assumption of homogeneity of variances.

Relationships between Two Variables (With Moderating Variable)

Hypotheses 3, 6, 7, and 8 test the relationships between two variables with a third variable as a moderator. The first step in testing these relationships was to examine the correlations and partial correlations among the variables, including using scatterplots to visually examine the data. Second, a multiple regression model was used to examine the hypothesized relationships. Scatterplots of residuals were examined to verify compliance with the assumptions of linear regression. Where one of the variables was a classification variable, multiple analysis of variance (MANOVA)

was used. Analysis of variance allows the partioning of the variance caused by various effects attributable to the variables (Emory, 1985).

Testing the Fit of the Model

Hypotheses 9, 10, and 11 state that certain configurations of variables are associated with certain outcomes. In other words, they propose that the outcome variables of satisfaction, performance, and commitment are positively related to the fit of the model. Two methods for measuring fit have been used frequently in strategy research: a matching model, and a moderation approach (Hoffman, Cullen, Carter, & Hofacker, 1992). Venkatraman (1989) concluded that the moderation approach provides a better method of fit than the matching approach; this was empirically verified by Hoffman *et al.* (1992). The moderation approach assumes that statistical interactions, when significant, demonstrate that combinations of variables affect an outcome variable, such as performance. Use of the moderation approaches requires creation of an interaction term formed by the product of the independent variable and the hypothesized moderating variable. In this research, the independent variables are the hypothesized antecedents, while the moderating variables are the management control systems and supervisory control methods. Mathematically, the relationship is as follows:

$$Y = a + bX + cZ + dXZ, \text{ where}$$

Y = dependent variable

X = independent variable

Z = moderating variable, and

XZ = interaction term (representing fit)

The use of a moderation approach requires that the independent variable be entered into the regression equation first, followed by the moderating variable. The interaction term is entered only after the independent variable and the moderating

variable so that only the unique contribution of the interaction to the regression is measured. If the addition of the interaction term to the model significantly increases the R-squared, and the regression weight of the interaction term is significant, then the fit of the independent and moderator variable is related to the dependent variable. In other words, if "d" in the above equation is positive and significant, then the positive influence of the independent variable on the dependent variable is greater when the moderating variable is large than when it is small (Covin and Slevin, 1989).

The use of the moderation approach limits the test to three variables at one time. It is necessary, therefore, to use this procedure on the following configurations of variables:

1. Technology, MCS, and Satisfaction
2. Technology, MCS, and Performance
3. Technology, MCS, and Commitment
4. Size, MCS, and Satisfaction
5. Size, MCS, and Performance
6. Size, MCS, and Commitment
7. PEU, MCS, and Satisfaction
8. PEU, MCS, and Performance
9. PEU, MCS, and Commitment
10. Structure, MCS, and Satisfaction
11. Structure, MCS, and Performance
12. Structure, MCS, and Commitment
13. Task uncertainty, SCM, and Satisfaction
14. Task uncertainty, SCM, and Performance
15. Task uncertainty, SCM, and Commitment
16. Input uncertainty, SCM, and Satisfaction
17. Input uncertainty, SCM, and Performance
18. Input uncertainty, SCM, and Commitment
19. Goal congruence, SCM, and Satisfaction
20. Goal congruence, SCM, and Performance
21. Goal congruence, SCM, and Commitment

Configurations of Variables and Outcomes

Hypothesis 12 states that the configuration of context variables is related to the choice of MCS. The testing of the individual variables has already been explained. To test the configuration, multiple regression is used, with the MCS as the dependent variable, and PEU, technology, size, and structure as the independent variables.

Significance Level for Hypothesis Testing

According to Sauley and Bedeian (1989), the level of significance appropriate to a study should be determined by several factors, including sample size, effect size, measurement error, the practical consequences of rejecting a null hypothesis, the coherence of underlying theory, the degree of experimental control, and the robustness of the statistical test used to violation of its assumptions. In this study, hyotheses were tested at the traditional .05 significance level. Given the exploratory nature of this research and the desire to avoid what Morrison and Henkel (1969) refer to as a false dichotomy of significant or not significant, test results which fall in the .05 to .10 range were evaluated. The term "approaching significance" is used to designate such results.

Summary

There were three major items presented in this chapter. First, the setting and the sample for the study were presented and the rationale for each was discussed. Second, the development of the study's instrumentation was described, including a description of each variable, the scales used to measure the variable, and the rationale for choosing existing scales or developing new scales for this study. Third, the methods used to analyze the data were presented. In the next chapter, the results of the study are presented.

CHAPTER IV

RESULTS AND DISCUSSION

This chapter presents the results of the statistical analysis of the measures used in the study and of the hypotheses. The first section presents the data collection methods used and the response rates obtained. Information regarding the reliabilities of the measures is then presented, followed by the analysis of each hypothesis.

Data Collection

Different methods of data collection were used in the two hospitals. In hospital one, questionnaires were distributed along with the payroll envelopes. Employees were provided a stamped, self-addressed return envelope. A follow-up mailing was also used to solicit questionnaires from departments heads of departments where employees had responded but the department head had not. A total of 250 questionnaires were distributed; 93 questionnaires were returned, of which 91 were usable, for a response rate of 36.4 percent. At the department level, usable departmental data was collected on 31 of 33 departments, for a department response rate of 93.9 percent.

In hospital two, a memo was sent to employees requesting that they voluntarily attend a meeting in the hospital's auditorium for the purpose of filling out a questionnaire. Two meetings were held, each around change-of-shift time, thus allowing employees from all three shifts to participate. Some questionnaires were also distributed by night-shift supervisors. Follow-up surveys were sent to department heads in departments from which employee responses had been gathered but no

supervisor questionnaire had been returned. A total of 94 questionnaires were returned, of which 89 were usable, for a response rate of 20.9 percent. At the department level, usable data was collected on 27 of 59 departments, for a response rate of 45.8 percent. Including both hospitals, the overall response rate at the individual level was 26.4 percent. At the department level, the overall response rate was 63 percent.

Performance questionnaires were distributed to director-level executives in each hospital. In hospital one, five responses were received out of seven distributed, for a response rate of 71.4 percent. In hospital two, eight responses were received out of eight distributed, for a response rate of 100 percent.

Measures

Reliability estimates were calculated for all measures used in the study, using Chronbach's (1970) alpha method for estimating internal reliability. Where necessary, items were eliminated from newly-developed scales to improve reliabilities. Care was taken in eliminating items so that the construct validity of the measures would not be diminished. The resulting reliability estimates are reported in Table 7. Seven scales had reliability coefficients greater than .90; eleven had coefficients between .80 and .89; eleven had coefficients between .70 and .79; three had coefficients between .60 and .69; and two had coefficients between .50 and .59. The low reliabilities of the five scales with coefficients less than .70 make conclusions drawn from those measures suspect.

Statistical Power

The power of the test measures the probability of rejecting a null hypothesis when it is true, and is dependent on the sample size, the significance level, and the magnitude of effect in the population (Cohen & Cohen, 1983). Higher statistical

TABLE 7

SOURCES AND RELIABILITIES OF MEASURES

Measure	Source(s)	Previous Reliability	Pre-test # of Items	Pre-test Reliability	Final # of Items	Study Reliability
Technology	Withey, Daft, & Cooper, 1983					
Exceptions		.81	5	.89	5	.91
Analyzability		.85	5	.89	5	.90
Environmental Uncertainty						
State Certainty	Gerloff, Muir, & Bodenstein, 1991	.84	5	.59	3	.79
Effect Certainty	Newly-developed		4	.89	4	.81
Response Certainty	Milliken, 1990	.75	4	.64	4	.78
Dynamism/Complexity	Newly-developed		9	.91	6	.87
Munificence	Keats & Hitt, 1988	.82	2		6	.56
	Yasai-Ardekani, 1989		1			
	Newly-developed		2			
Structure	Bourgeois *et. al*, 1978		9	.83	12	.81
	Meadows, 1980	.89				
	Zanzi, 1987	.68				
Bureaucratic Control	Newly-developed		8	.76	7	.78
Cultural Control	Newly-developed		8	.61	9	.74
Community					7	.80
Rules & Paperwork					4	.57
Task Complexity	Billings, Klimoski, & Breaugh,		5	.64	4	.61
	1977		1			
	Ouchi & Maguire, 1975					
Input Uncertainty						
Variety/Unpredictability	Glisson, 1978	.69	4	.67	3	.72
Intensity of Worker/ Client Relationship	Newly-developed		6	.72	5	.66
Output Measures						
Availability	Ouchi & Maguire, 1975		1		1	
Cost	Newly-developed		5		5	.68
Source of Shared Meanings & Values	Newly-developed					
Superiors			4		3	.84
Co-workers			4		3	.87
Professional colleagues			4		3	.83
Outside professionals			4		3	.86
Goal Congruence	Newly-developed	12		.75		
Actual/Perceived					12	.91
Actual/Actual					12	.99
Perceived/Perceived					12	.99
Supervisory Control Method	Newly-developed					
Output Control			5	.93	4	.83
Behavior Control			5	.83	4	.77
Professional Control			5	.91	5	.76
Ritual Control			5	.88	5	.79
Self-Control					5	.79
Department Performance	Koberg & Ungson, 1987 (adapted)	.64	2		6	.98
	Newly-developed		4			
Job Satisfaction	Hackman & Oldham, 1976	.75	5	.83	5	.84
Organizational Commitment	Mowday, Steers, & Porter, 1979	.90	15	.87	15	.89
Reasons for Rules	Newly-developed				4	.75
Confidence in Management					6	.90

power is preferred to lower statistical power. Statistical power was determined using tables from Cohen and Cohen (1983) and two equations. The first equation determines the necessary effect size (f^2) based on the desired value of R-squared:

$$f^2 = R^2/(1 - R^2)$$

The second equation uses the table value (L), the f^2 value determined above, and the number of independent variables being tested (k) to determine the sample size (n^*) required to have the necessary statistical power:

$$n^* = (L / f^2) + k + 1$$

The usable sample size at the individual level was 180 questionnaires. At the .05 significance level, a .99 power level is possible with as many as 20 independent variables, assuming a R-squared of .20 to be the minimum value of interest. At the department level, 58 questionnaires were usable. At this level, a power of .80 can be achieved with a .05 significance level and .20 R-squared level with up to five independent variables. The smallest sample size used in a regression analysis in this study was N = 48, with two independent variables. At the .05 significance level with a minimum R-squared of .20, the power of the test is .86. The sample size, therefore, appears to be of sufficient size to allow for substantial statistical power in the testing of the study's hypotheses.

Test for Sample Differences

Differences between the two hospitals included in the study were tested using T-tests. Results are shown in Table 8. Consistent with its heavier orientation toward research, hospital two had a higher level of education and its employees perceived its technology to be less routine. They also perceived a higher level of task complexity, a higher level of environmental dynamism, and greater intensity in the worker/client

TABLE 8

TESTS FOR DIFFERENCES IN HOSPITAL SAMPLES

Measure	Hospital 1 Mean	Hospital 2 Mean	Two-tailed T-Test
Availability of output measures	1.63	1.49	1.91
Years of professional training	4.20	4.73	-.86
Time in Profession	11.03	11.06	-.03
Time with current employer	5.74	4.59	1.43
Time in current department	5.05	3.86	1.63
Time in current position	3.68	3.30	.61
Number of positions	1.63	1.77	-.99
Educational level	2.64	3.95	-5.41**
Age	39.60	38.78	.54
Gender	1.10	1.22	-2.13*
Percent of income from position	39.16	52.53	-3.17**
Number of applicants	8.99	2.75	3.58**
Supply of professionals	3.57	3.99	-2.83**
Department size	11.51	10.11	1.23
Perceived department performance	28.28	27.23	2.19*
Goal congruence (actual/actual)	6.81	8.04	-1.06
Goal congruence (actual/perceived)	8.47	7.27	1.22
Goal congruence (perceived/perceived)	11.18	13.56	-2.20*
Technology	50.26	43.87	3.93**
Structure	45.03	46.48	-1.00
Cultural control	54.11	51.83	1.68
Task complexity	17.08	19.75	-3.52**
Job satisfaction	27.60	23.84	4.18**
Risk aversion	12.78	13.00	-.49
Reasons for rules	22.47	21.19	1.83
Dynamism	24.78	28.12	-2.62**
Output control	4.33	4.28	.20
Behavior control	5.54	5.19	1.89
Ritual control	4.80	4.38	2.22*
Professional control	4.17	3.96	1.06
Self control	5.82	5.43	2.43*
State certainty	10.85	11.51	-1.18

TABLE 8 (continued)

TESTS FOR DIFFERENCES IN HOSPITAL SAMPLES

Measure	Hospital 1 Mean	Hospital 2 Mean	Two-tailed T-Test
Effect certainty	16.60	15.64	1.43
Response certainty	16.90	16.53	.55
Input uncertainty	10.42	10.34	.14
Confidence in management	32.08	27.28	3.98**
Intensity of worker/client relationship	22.14	24.33	-2.64**
Supervisor as source of values	13.92	12.83	1.46
Coworkers as source of values	7.99	8.85	-1.21
Professionals as source of values	14.02	13.18	1.17
Others as source of values	9.60	10.53	-1.14
Organizational commitment	81.61	77.24	1.86
Perceptions of munificence	28.00	26.70	.72
Cost of output measures	21.64	18.93	1.49

* $p < .05$
** $p < .01$

relationship. Hospital two also had a higher percentage of female employees, and its contribution to the family income of its workers was higher. Hospital one's management perceived department performance to be higher than did hospital two's management; likewise, the workers at hospital one had a higher confidence in management and reported higher levels of job satisfaction. Hospital one's workers also reported higher levels of ritual control and self control. In testing the hypotheses, whenever one of the above variables was an independent variable, a dummy variable for the hospital was included in the regression model to isolate organization-specific relationships. The exception to this was when testing the fit of the model (hypotheses 9-11) using moderated regression analysis. In this situation, the purpose was to examine the fit of the model within departments in the organization; including the hospital variable in the moderated regression model, therefore, was inappropriate.

Pearson product-moment correlations for the demographic and study variables were calculated to assess potential confounds due to demographic differences. Several significant correlations were found (see Table 9), but did not appear to present serious confound problems. Actual/perceived goal congruence was negatively related to age, implying that older workers perceive a greater difference between their goals and their supervisors' goals. Actual/actual goal congruence was positively related to professional training and time employed, time with the department, and time in the position. Such employees and their supervisors have a better shared knowledge of departmental goals.

Routine technology was negatively correlated with professional training, education, and the percentage of family income provided by the position. It is not surprising that those with more education and professional training are performing more non-routine jobs, which are likely to have a higher pay scale and thus contribute substantially to family income. Similarly, organic structure was positively correlated

TABLE 9

CORRELATIONS AMONG DEMOGRAPHIC AND STUDY VARIABLES

	PROFTRAN	TIMEPROF	TIME_EMP	TIMEDEPT	TIMEPOS	NUM_POS
OUTPUTMS	-.1769*	-.0321	-.0218	-.0150	.0071	-.0402
DEPTSIZE	.0281	-.0065	.0254	-.0318	.0294	.0988
PERFORM	-.0033	-.0817	-.0551	.0707	.0068	-.1420
WK_STATU	-.4374**	-.3595**	-.1935*	-.1445	-.0162	-.3717**
CONGR1	.1217	.0262	-.0949	-.1083	-.0089	.0648
CONGR2	.1710*	.0278	.2137**	.2658**	.2741**	.0360
CONGR3	.0951	.0098	.1527	.1149	.1706	.0629
TECHNOLO	-.2517**	-.0640	.0659	.0297	-.0089	-.0035
STRUCTUR	.0214	-.0415	-.0266	.0660	-.0166	.0113
BUREAUCR	.0395	-.0749	.0310	-.0068	-.0586	.0324
CULTTOTA	-.1749*	-.1335	-.1193	-.1198	-.1308	-.1309
TASKCOMP	.4063**	.1445	.0777	.0753	.0862	.1843*
JOBSATIS	-.2074**	-.1890*	-.2864**	-.3275**	-.3132**	-.1494
RISKAVER	.1659*	.0562	.0089	-.0331	-.0525	.2444**
WHYRULES	-.0458	-.0799	.0523	-.0019	-.0488	.1175
DYNAMISM	.2700**	.0633	.0604	.0763	.1182	.2055**
OUTPUTCN	.0820	.0044	.0541	.0281	.0542	.0163
BEHAVCNT	-.0081	-.0347	-.0079	-.0174	-.0421	.0742
RITUALCN	-.0374	-.0446	-.0553	-.0876	-.0613	.0537
PROFCNTL	.1588*	-.0590	-.1054	-.0852	-.0880	.0960
SEFLCNTL	-.3018**	-.1339	-.1424	-.1450	-.1390	-.1394
STATECRT	.1703*	.0438	.1419	.1575*	.1364	.0822
EFFECTCR	.1161	-.0695	-.0197	-.0040	-.0684	.0967
RESPCERT	-.0891	.0082	-.0013	-.0129	.0322	-.0143
INPUTCRT	.0908	-.0512	.0261	.0371	.0187	.0472
CONFIDEN	-.1340	-.0949	-.1597*	-.1493	-.1861*	-.1212
INTENSIT	-.0057	-.0812	.0554	.0318	.0782	.0767
SUPVALUE	-.1207	-.1790*	-.1769*	-.1703*	-.1755*	.0293
COWORKVL	.1486	.0746	-.0088	.0109	-.0233	.1405
PROFVAL	.0028	-.2289**	-.1797*	-.1994**	-.1639*	.0143
OTHERVAL	.3669**	.0029	-.0490	-.0198	-.0563	.1266
ORGCOMM	-.1613*	-.0633	-.0257	-.0542	-.0981	.0005
MUNPERC	-.0662	-.4085**	-.1930	-.1803	-.2655	.1490
COSTOUT	.0140	-.1195	.1575	.1641	.0717	.0531

* p < .05
** p < .01

TABLE 9 (continued)

CORRELATIONS AMONG DEMOGRAPHIC AND STUDY VARIABLES

	SHIFT	EDUCATE	AGE	INCOME%
OUTPUTMS	.0501	-.2193**	-.0241	-.1951*
DEPTSIZE	.3770**	-.1728*	-.1331	.2030*
PERFORM	-.0584	-.0808	-.0562	-.1068
WK_STATU	-.1251	-.0276	-.1327	-.4070**
CONGR1	.0654	-.0729	-.1588*	-.1499
CONGR2	.0627	-.0039	-.0067	-.0466
CONGR3	.0957	.0287	.0404	-.0459
TECHNOLO	-.0599	-.2631**	.0933	-.2458**
STRUCTUR	-.0701	.1718*	-.0392	.1364
BUREAUCR	-.0123	-.2234**	.0951	.1687
CULTTOTA	-.0635	.0363	.0258	-.0480
TASKCOMP	.0887	.2287	.0775	.4139**
JOBSATIS	-.1780*	-.0894	-.0972	-.0562
RISKAVER	.0521	-.1161	.0236	-.0332
WHYRULES	.0024	-.0616	-.0155	-.0411
DYNAMISM	.1514*	.1804*	-.0805	.2562**
OUTPUTCN	.0293	.0668	.1022	.1628
BEHAVCNT	.0093	-.1095	-.0032	.1341
RITUALCN	.0590	.0047	-.1477	-.0725
PROFCNTL	-.0381	.0180	-.1383	.0870
SEFLCNTL	-.1482	-.1151	.1225	-.0969
STATECRT	-.0218	.1813*	.0287	.1003
EFFECTCR	-.0829	-.0198	-.0474	.1610
RESPCERT	-.0875	.0447	.0482	-.1465
INPUTCRT	.1041	-.0557	.0036	.0741
CONFIDEN	-.2052**	-.1539*	.0972	-.0144
INTENSIT	.1197	.1337	-.0585	.2749**
SUPVALUE	.0034	-.0522	-.0872	-.0469
COWORKVL	.0565	.2795**	-.1006	-.0824
PROFVAL	-.0501	.0903	-.1997*	-.1811
OTHERVAL	-.0814	.1369	-.1810*	.3335**
ORGCOMM	-.1643*	-.1758*	.0736	.0397
MUNPERC	-.1414	-.2167	.1512	-.0581
COSTOUT	-.0909	.0657	-.2787	-.2421

* p < .05
** p < .01

with education, suggesting that workers with higher education levels tend to perceive the structure of their departments to be more organic, while workers with less education perceive their departments to be more mechanistic. Since workers with less education tend to hold more routine jobs, this finding was not unexpected.

Cultural control was negatively correlated with professional training; this finding may demonstrate the difficulty of controlling professionals through organizational means. Task complexity was positively correlated with professional training, number of positions with the organization, and the percentage of family income provided by the position. None of these findings are unexpected or unusual.

Job satisfaction was negatively correlated with professional training, implying that professionals have higher levels of expectations from their employers, and, when these expectations are not realized, job satisfaction declines. Job satisfaction was also negatively correlated with time in profession, time with the employer, time in the current department, time in the current position, and shift. This implies that job satisfaction decreases with time, especially for professionals. That afternoon and night shifts report lower job satisfaction is not surprising given normal attitudes toward non-standard work shifts. Similarly, confidence in management was negatively related to time employed with the organization, time in position, shift, and education level. Organizational commitment was also negatively related to professional training, shift, and education level. Similar dynamics would appear to be found in these situations.

Risk aversion was related to professional training and number of positions with the organization, implying that professionals may be more risk averse and that those who have held more positions within an organization are more risk averse, possibly due to increased knowledge of risks throughout the organization—especially those relating to malpractice and legal liability.

Dynamism was positively related to professional training, number of positions in the organization, shift, educational level, and percentage of family income provided by the position. Those in higher positions (with more professional training and education) would be expected to perceive higher levels of dynamism. The relationship between dynamism and shift implies that those who work afternoon or night shifts perceive higher levels of environmental dynamism. State certainty was positively related to professional training, time in department, and education.

Professional control was positively correlated with professional training, as expected. Self control, however, was negatively correlated with professional training. Professional control appears to substitute for self control for professional workers.

The source of values was affected by the time variables (profession, employee, department, and position) for supervisor values and professional values, with all correlations negative. The longer someone is employed, the less he or she relies on supervisors or professionals as a source of values. Professional training, age, and percentage of family income provided by the position, however, were all positively related to viewing people other than coworkers, professionals, or supervisors as a source of values.

Time in the profession was negatively related to perceptions of munificence, implying that the longer someone is in a profession, the less munificent the environment appears. Whether this represents an actual reduction in resources or selective memory retention is difficult to say.

Most of the relationships indicated by the above correlations are expected given the nature of the constructs. Therefore these relationships are generally not a concern in testing the hypotheses. The correlation of age with actual/perceived goal

congruence, however, could affect the relationship between supervisory control methods and their antecedents.

The normality of the data was tested using the Kolmogorov-Smirnov test (Kolmogorov, 1941). Eleven variables failed to exhibit normality; these are identified in Table 10. Many of these were demographic variables that would naturally be skewed toward the lower end of the distribution: years of professional training, time in profession, time employed by firm, time in department, and time in position. Educational level appeared to be bi-modal, with a large group of employees with low levels of education and a large group with very high levels of education; this is consistent with a hospital's typical work force. Two forms of goal congruence (actual/perceived and actual/actual) were skewed toward lower values, indicating a high level of goal congruence among most workers.

Behavior control was skewed toward higher values; as a crucial study variable, this could have an effect on testing of the hypotheses. Because of this, the pattern of individual responses within departments was examined to determine if there was general agreement on the level of behavior control among department members. In 50 of the 58 departments (86.2 percent), the range of responses indicated general agreement on the level of behavior control, implying that the skewness reflects high perceived levels of behavior control in this sample. The eight departments in which there was not general agreement on the level of behavior control were all in hospital two. A T-test was used to determine if the level of behavior control was perceived similarly by supervisors and subordinates; the test was significant ($T = 2.52$, $p < .05$). Supervisors perceived higher levels of behavior control than did subordinates. This effect was hospital specific: in hospital one there was no difference between supervisor and subordinate perceptions of behavior control ($T = .96$, $p = .34$), while in

TABLE 10

STUDY VARIABLES WHICH DO NOT EXHIBIT NORMALITY USING KOLMOGOROV-SMIRNOV TEST

Variable	Kolmogorov-Smirnov D	Comment
Professional training	.1384**	Skewed toward lower values
Time in profession	.1113*	Skewed toward lower values
Time employed with firm	.2332**	Skewed toward lower values
Time in department	.2343**	Skewed toward lower values
Time in position	.2109**	Skewed toward lower values
Educational level	.2133**	Bi-Modal
Goal congruence (1)	.1699**	Skewed toward lower values
Goal congruence (2)	.1402**	Skewed toward lower values
Reasons for rules	.1432**	Bi-Modal
Behavior control	.1389**	Skewed toward higher values
Source of coworker values	.1453**	Skewed toward lower values

* $p < .05$
** $p < .01$

hospital two there was a significant difference between supervisors and subordinates ($T = 2.64$, $p = .01$).

Hypothesis Testing

Hypotheses were tested according to the methodology described in Chapter 3. Individual-level analysis is based on individual responses; department-level analysis is based on mean responses for each department. Chronbach's alpha was used to estimate the interrater reliability within departments, with all departments having interrater reliabilities of .94 or higher. The 58 departments from which responses were received ranged in size from 2 to 27 workers (mean = 11, s.d. = 7.1). As mentioned earlier, this allows for statistical power of .80 assuming a .05 significance level, a .20 R-squared as the minimum value of interest, and up to five independent variables.

Hypothesis One

The first part of hypothesis one predicted a relationship between routine technology and bureaucratic control. The higher the technology score, the more routine the technology; the higher the bureaucratic control scale, the more bureaucratic control. Thus the correlations between the two scales should be positive. At the department level, there was a significant correlation between routine technology and bureaucratic control ($r = .26$, $p = .0449$). On the individual level the hypothesis was also supported ($r = .31$, $p = .0001$).

The second part of the hypothesis stated that non-routine technology would be related to the use of cultural control. This required a significant negative correlation between technology and cultural control. At the department level, this hypothesis was not supported for the cultural control scale ($r = .13$, $p = .3336$), nor was it supported at the individual level ($r = .10$, $p = .1772$).

A forward stepwise linear regression model confirmed these results (see Table 11). At the department level, bureaucratic control entered the model ($R^2 = .07$, $p = .0449$; $\beta = .2644$, $p = .0449$), while cultural control did not. At the individual level, bureaucratic control entered the model ($R^2 = .0905$, $p < .0001$; $\beta = .30$, $p < .0001$), while cultural control did not.

Because the two hospitals reported significantly different levels of technology, a regression model including the hospital as a dummy variable was used to check for an organization effect. The hospital variable and bureaucratic control were both significant at the individual level, and inclusion of the hospital variable in the model significantly ($F = 17.52$, $p < .0001$) increased the R-squared from .09 to .14 (see Table 11). Inclusion of the hospital variable in the department-level analysis resulted in bureaucratic control becoming insignificant, while the hospital variable approached significance. Routine technology, therefore, was related to perceptions of bureaucratic control on both the department and individual levels. Non-routine technology was not related to perceptions of cultural control at either the department or individual level. The inclusion of the hospital as a moderating variable resulted in bureaucratic control not being significant at the department level, while remaining significant at the individual level.

Hypothesis Two

Hypothesis two examined the relationship between management control systems and department size, and predicted that larger organizational units tend to use bureaucratic control, while smaller organizational units tend to use cultural control. At the department level, bureaucratic control significantly correlated with department size ($r = .26$, $p = .0522$). Department size did not significantly correlate with cultural control ($r = -.15$, $p = .2761$), although the relationship was in the expected direction.

TABLE 11

FORWARD STEPWISE REGRESSION ANALYSIS RELATIONSHIP OF MCS AND TECHNOLOGY

Department Level

Relationship of Bureaucratic and Cultural Control to Technology

Variable	*B*†	SE(*B*)	β‡	T	p (T)
Bureaucratic Control	.3124	.1523	.2644	2.05	.0449

$F(1,56) = 4.21$, $p = .0449$, $R^2 = .0698$

Relationship of Bureaucratic and Cultural Control and Hospital to Technology

Variable	*B*†	SE(*B*)	β‡	T	p (T)
Bureaucratic Control	.1924	.1650	.1628	1.17	.2485
Hospital	-3.8316	2.2175	-.2413	-1.73	.0896

$F(2,55) = 3.67$, $p = .0319$, $R^2 = .1178$

Individual Level

Relationship of Bureaucratic and Cultural Control to Technology

Variable	*B*†	SE(*B*)	β‡	T	p (T)
Bureaucratic Control	.4430	.1061	.3008	4.17	.0001

$F(1,175) = 4.21$, $p < .0001$, $R^2 = .0905$

Relationship of Bureaucratic and Cultural Control and Hospital to Technology

Variable	*B*†	SE(*B*)	β‡	T	p (T)
Bureaucratic Control	-5.4079	1.6464	-.2389	-3.28	.0012
Hospital	.3502	.1071	.2378	3.27	.0013

$F(2,174) = 14.59$, $p < .0001$, $R^2 = .1436$

† unstandardized regression weight
‡ standardized regression weight

To further test the hypothesis, a linear regression model was used at the department level, with department size as the dependent variable and bureaucratic control and cultural control as the independent variables (see Table 12). The model was significant ($R^2 = .13$; $p = .0203$). Both the bureaucratic and cultural control variables were significantly related to department size, with a positive beta coefficient for bureaucratic control and a negative beta coefficient for cultural control, as hypothesized.

The combination of correlation and linear regression results provided substantial support for this hypothesis. Department size positively related to bureaucratic control, as shown by both correlations and linear regression results. Department size was also negatively related to cultural control, as shown by regression results.

Hypothesis Three

The first part of hypothesis three stated that regardless of munificence or scarcity, if management of an organizational unit perceived little environmental uncertainty, then bureaucratic control systems would predominate. Several types of perceived environmental uncertainty were measured; based on construct definitions, dynamism and state certainty were the most likely PEU variables to be significantly related to bureaucratic or cultural control. The wording of this hypothesis required including only those who are managers/supervisors of a department (N = 54).
The correlations between bureaucratic control and the PEU measures (dynamism, state certainty, effect certainty, and response certainty) are given in Table 13. Only dynamism correlated significantly with bureaucratic control ($r = -.3756$, $p = .0056$). The negative correlation indicates that bureaucratic control decreases as dynamism increases, and thus supports the hypothesis that bureaucratic control systems will

TABLE 12

FORWARD STEPWISE REGRESSION ANALYSIS
RELATIONSHIP OF MCS AND DEPARTMENT SIZE

Relationship of MCS and Department Size (Department Level)

Variable	*B*	SE(*B*)	β	T	p (T)
Bureaucratic Control	.3759	.1418	.3582	2.65	.0104
Cultural Control	-.2708	.1319	-.2772	-2.05	.0449

$F(2,55) = 4.19$, $p = .0203$, $R^2 = .1321$

TABLE 13

CORRELATIONS AMONG PEU AND MCS VARIABLES (SUPERVISORS ONLY)

Without a Munificence Condition (N=54)

	1	2	3	4	5	6
1. Bureaucratic Control						
2. Cultural Control	.2472					
3. Dynamism	-.3756**	-.2587				
4. State Certainty	-.2644	-.1828	.2008			
5. Effect Certainty	.1801	.2706	-.0551	.0371		
6. Response Certainty	.2145	-.2003	.0481	.2022	-.3624**	
7. Perception of Munificence	.2699	.3871**	-.3569*	-.1787	.4408**	.0040

* $p < .05$
** $p < .01$

High Munificence Condition (n=26)

	1	2	3	4	5
1. Bureaucratic Control					
2. Cultural Control	-.3878				
3. Dynamism	-.4232*	-.0887			
4. State Certainty	.2323	-.2073	.3974*		
5. Effect Certainty	-.0512	-.1332	.2925	.0504	
6. Response Certainty	.1109	-.1371	-.0667	.3218	-.2974

* $p < .05$

Low Munificence Condition (n=18)

	1	2	3	4	5
1. Bureaucratic Control					
2. Cultural Control	.6755**				
3. Dynamism	-.1106	-.0937			
4. State Certainty	-.4217	-.1144	-.1021		
5. Effect Certainty	.1186	.1312	-.0577	.0338	
6. Response Certainty	.5312*	.1600	-.0637	-.1652	-.4183

* $p < .05$
** $p < .01$

predominate when management perceives little environmental uncertainty, as measured by the perceived dynamism of the environment. When a multiple regression model with bureaucratic control as the dependent variable and dynamism, state certainty, effect certainty, and response certainty as independent variables was used to test these relationships, the model was significant ($R^2 = .3420$, $p < .01$, see Table 14). Dynamism and state certainty were negatively related to bureaucratic control, while effect and response certainty exhibited positive relationships. Three of these—dynamism, state certainty, and effect certainty—were in the expected direction; response certainty was in the opposite direction. These results indicate that under conditions of munificence or scarcity, bureaucratic control is associated with low perceived dynamism and state certainty and high effect and response certainty. When the hospital variable was added to the model, the pattern remained similar, but dynamism and response certainty became insignificant (see Table 14). State certainty and effect certainty remained significant, with beta cofficients in the predicted directions, and the hospital variable was also significant. This implies that the relationships of dynamism and bureaucratic control and response certainty and bureaucratic are hospital-specific, while the relationships of state certainty and effect certainty with bureaucratic control are not.

In contrast, with cultural control as the dependent variable, the model was not significant, but did approach significance ($R^2 = .16$, $p = .0698$, see Table 14). None of the PEU variables were significantly related to cultural control. The addition of the hospital variable to the model increased the R-squared slightly but not significantly ($F = 1.7537$, $p = .1911$), but the model and all independent variables remained insignificant and the pattern of results did not change (see Table 14). Thus when munificence is not a factor, PEU is not associated with cultural control.

TABLE 14

REGRESSION ANALYSIS
RELATIONSHIP OF PEU AND MCS

Relationship of PEU variables to Bureaucratic Control

Variable	*B*	SE(*B*)	β	T	p (T)
Dynamism	-.2639	.1003	-.3184	-2.63	.0115
State Certainty	-.4644	.1961	-.2943	-2.36	.0220
Effect Certainty	.4682	.1874	.3203	2.50	.0160
Response Certainty	.5608	.1806	.4053	3.11	.0032

$F(4,49) = 6.11$, $p = .0005$, $R^2 = .3420$

Relationship of PEU variables and Hospital to Bureaucratic Control

Variable	*B*	SE(*B*)	β	T	p (T)
Dynamism	.0252	.1478	.0220	.17	.8651
State Certainty	-.7399	.3161	-.2957	-2.34	.0231
Effect Certainty	.6184	.2923	.2805	2.11	.0391
Response Certainty	.1658	.2758	.0748	.60	.5503
Hospital	-4.5039	1.7176	-.3351	-2.62	.0114

$F(5,52) = 4.14$, $p = .0031$, $R^2 = .2848$

Relationship of PEU variables to Cultural Control

Variable	*B*	SE(*B*)	β	T	p (T)
Dynamism	-.2280	.1408	-.2167	-1.62	.1118
State Certainty	-.2674	.2752	-.1335	-.97	.3360
Effect Certainty	.4367	.2633	.2353	1.66	.1036
Response Certainty	.1359	.2538	-.0773	-.54	.5949

$F(4,49) = 2.32$, $p = .0698$, $R^2 = .1593$

Relationship of PEU variables and Hospital to Cultural Control

Variable	*B*	SE(*B*)	β	T	p (T)
Dynamism	-.2485	.1704	-.2014	-1.46	.1508
State Certainty	-.4375	.3645	-.1627	-1.20	.2356
Effect Certainty	.2661	.3371	.1123	.79	.4336
Response Certainty	-.4317	.3181	-.1812	-1.36	.1807
Hospital	-1.8136	1.9811	-.1256	-.92	.3642

$F(5,52) = 2.22$, $p = .0657$, $R^2 = .1761$

TABLE 14 (continued)

REGRESSION ANALYSIS
RELATIONSHIP OF PEU AND MCS

Relationship of PEU variables and Munificence to Cultural Control

Variable	*B*	SE(*B*)	β	T	p (T)
Dynamism	-.1567	.1438	-.1489	-1.09	.2811
State Certainty	-.2549	.2697	-.1272	-.95	.3493
Effect Certainty	.2211	.2857	.1191	.77	.4428
Response Certainty	-.1913	.2506	-.1089	-.76	.4490
Munificence	4.6302	2.6371	.2605	1.76	.0855

$F(5,48) = 2.55$, $p = .0397$, $R^2 = .2101$

Relationship of PEU variables, Munificence, and Hospital to Cultural Control

Variable	*B*	SE(*B*)	β	T	p (T)
Dynamism	-.2657	.1813	-.2244	-1.47	.1509
State Certainty	.1879	.3611	.0811	.52	.6059
Effect Certainty	.2352	.3088	.1201	.76	.4509
Response Certainty	-.1019	.3613	-.0432	-.28	.7794
Munificence	2.8687	1.6932	.2579	1.69	.0982
Hospital	-2.0571	1.7371	-.1849	-1.18	.2435

$F(6,47) = 1.48$, $p = .2118$, $R^2 = .1851$

Relationship of PEU variables and Munificence to Bureaucratic Control

Variable	*B*	SE(*B*)	β	T	p (T)
Dynamism	-.2611	.1048	-.3121	-2.49	.0162
State Certainty	-.4706	.1965	-.2955	-2.39	.0206
Effect Certainty	.4695	.2082	.3182	2.26	.0287
Response Certainty	.5628	.1826	.4030	3.08	.0034
Munificence	.0369	1.9220	.0026	.02	.9848

$F(5,48) = 4.86$, $p = .0011$, $R^2 = .3359$

Relationship of PEU variables, Munificence, and Hosptial to Bureaucratic Control

Variable	*B*	SE(*B*)	β	T	p (T)
Dynamism	-.0625	.1399	-.0620	-.4469	.6574
State Certainty	-.4378	.2786	-.2218	-1.5713	.1242
Effect Certainty	.2815	.2382	.1689	1.1817	.2445
Response Certainty	.6113	.2787	.3042	2.1931	.0343
Munificence	1.5667	1.3062	.1654	1.1994	.2376
Hospital	-2.7877	1.3400	-.2943	-2.0803	.0441

$F(6,47) = 3.22$, $p = .0115$, $R^2 = .3314$

The second portion of hypothesis three proposed that under conditions of munificence, if department management perceived high environmental uncertainty, then cultural control systems would predominate. To avoid the loss of variance from segmenting the sample according to perceptions of munificence, munificence was entered into the regression model as a dummy variable, categorized as high/low based on the mean. With cultural control as the dependent variable, and dynamism, state certainty, effect certainty, response certainty and munificence as independent variables, the model was significant ($R^2 = .2101$, $p = .0397$, see Table 14). The munificence variable approached significance ($p = .0855$), but no other PEU variable was significant. The addition of munificence to the model resulted in an increase in the percentage of variance explained by the model, as the R-squared increased from .16 to .21, and this increase approached significance ($F = 3.3614$, $p = .0722$). Therefore high levels of environmental volatility do not lead to cultural control, but high perceptions of munificence are associated with cultural control. When the hospital variable was added to the model, the R-squared decreased and the model became insignificant, while the pattern of results did not change, indicating that these results are not organization-specific.

The third portion of the hypothesis proposed that perceived scarcity would lead to a bureaucratic control system under conditions of high PEU. With bureaucratic control as the dependent variable, and dynamism, state certainty, effect certainty, response certainty and munificence as independent variables, the model was significant ($R^2 = .3359$, $p = .0011$, see Table 14). Munificence was not significant, but each of the other PEU variables was significant, with beta coefficients in the same direction as when munificence was not included as a factor in the analysis. Compared with the model used to test the first portion of the hypothesis, the inclusion of munificence resulted in virtually no change in the proportion of variance explained by

the model (the R-squared decreased from .3420 to .3359, p = .6777). These results indicate that there is a significant relationship between PEU and bureaucratic control, but munificence or scarcity does not moderate that relationship.

Taken together, the results suggest that low levels of perceived environmental volatility, especially state and effect certainty, are associated with bureaucratic control regardless of the level of munificence. High levels of munificence are associated with cultural control regardless of the level of perceived environmental volatility. The relationship between dynamism and MCS appears to be hospital-specific.

Hypothesis Four

Part A of the hypothesis stated that if an organizational unit is perceived as having a mechanistic structure, it will tend to use bureaucratic control systems. Because the structure measure is bi-polar, with low values reflecting a mechanistic structure and high values an organic structure, the hypothesized relationship requires that bureaucratic control be negatively correlated with structure. At the department level, the correlation was in the hypothesized direction, but was not significant (r = -.0439, p = .7476). At the individual level, the correlation was negative and significant (r = -.16, p = .0395). The correlations, therefore, support the first part of the hypothesis at the individual level, but not at the department level.

The second part of the hypothesis stated that if an organizational unit is perceived as having an organic structure, it will tend to use cultural control systems. At the department level, this required a positive correlation between the structure measure and the cultural control measure. The correlation was positive and significant (r = .4454, p = .0005). At the individual level, the correlation was also significant (r = .2562, p = .0006). The correlations, therefore, support the second part of the hypothesis at both the individual and department level.

A linear regression model was used to further examine the relationships between structure and bureaucratic and cultural control (see Table 15). To support the hypothesis, the beta coefficient for bureaucratic control should be negative, while the beta coefficient for cultural control should be positive. At the individual level, the model was significant (R^2 = .1172, p = .0001); the bureaucratic control variable was significant, with a negative beta coefficient (ß = -.2345, p = .0018), and the cultural control variable was significant, with a positive beta coefficient (ß = .3151, p = .0001). The model was also significant at the department level (R^2 = .2483, p = .0004). The bureaucratic control variable approached significance with a beta coefficient in the hypothesized direction (ß = -.2403, p = .0612), while the cultural control variable was significant with a beta coefficient in the predicted direction (ß = .5338, p < .0001). The regression models, therefore, supported the hypothesis. Taken together, the correlations and linear regression results provide substantial support for the hypothesis that mechanistic structures are associated with bureaucratic control, and that organic structures are associated with cultural control.

Hypothesis Five

The first portion of hypothesis five stated that if the level of task complexity is high and the ability to measure outputs is high, output controls will be used, while the second portion stated that if the level of task complexity is low and the ability to measure outputs is also low, behavior controls will be used. The correlations among the variables were examined first, with a focus on the correlations of task complexity with behavior and output control. These were examined in three conditions: with no restrictions (N = 57), when output measures are available (N = 28), and when output measures are not available (N = 29). With no restrictions, neither output control (r = .1312, p = .331) nor behavior control (r = -.1643, p = .222) were significantly

TABLE 15

REGRESSION ANALYSIS
RELATIONSHIP OF MCS AND STRUCTURE

Individual Level

Relationship of MCS and Structure (Individual level)

Variable	*B*	SE(*B*)	β	T	p (T)
Cultural Control	.3366	.0788	.3151	4.27	.0001
Bureaucratic Control	-.2954	.0929	-.2345	-3.18	.0018

$F(2,173) = 11.48$, $p < .0001$, $R^2 = .1172$

Department Level

Relationship of MCS and Structure (Department level)

Variable	*B*	SE(*B*)	β	T	p (T)
Cultural Control	.5109	.1203	.5338	4.25	.0001
Bureaucratic Control	-.2471	.1293	-.2403	-1.91	.0612

$F(2,55) = 9.09$, $p < .0004$, $R^2 = .2483$

correlated with task complexity. When output measures were available, both output control ($r = -.2279$, $p = .244$) and behavior control ($r = -.2799$, $p = .1491$) were not correlated significantly with task complexity. When output measures were not available, the correlation between task complexity and behavior control was not significant ($r = -.0311$, $p = .8727$), but the correlation between task complexity and output control was significant in the predicted direction ($r = .4593$, $p = .0122$). The correlation analysis provides little support for the hypothesized relationships among task complexity, the availability of output measures, and output or behavior control.

Regression analysis also failed to provide support for the first two portions of this hypothesis. Task complexity and availability of output measures (a dummy variable) were the independent variables. With output control as the dependent variable, the model was not significant ($R^2 = .0186$, $p = .6015$, see Table 16). With behavior control as the dependent variable, the model remained nonsignificant ($R^2 = .0270$, $p = .4773$, see Table 16). Adding the hospital variable to the analysis (because task complexity was significantly different in the two hospitals) did not change the pattern of the results (see Table 16).

The third portion of the hypothesis stated that if the level of task complexity was low and output measure availability was high, there would be no clear preference for either behavior or output controls. To test this hypothesis at the department level, a MANOVA design was used, with task complexity (categorized as high/low based on the mean) and availability of output measures as the independent variables, and both behavior and output controls as the dependent variables (see Table 17). While neither main effect was significant, the interaction was significant (Rao's $R = 4.88$, $p = .0114$). Inspection of the means, however, shows a clear preference for behavior controls over output controls in this sample, in that under all combinations of ability to measure outputs and task uncertainty, behavior control had a higher ranking than output

TABLE 16

REGRESSION ANALYSIS
RELATIONSHIP OF TASK COMPLEXITY AND THE AVAILABILITY OF OUTPUT CONTROLS TO OUTPUT AND BEHAVIOR CONTROL

Relationship of Task Complexity and Availability of Output Controls to Output Control (Department level)

Variable	*B*	SE(*B*)	β	T	p (T)
Task Complexity	.0453	.0464	.1316	.98	.3333
Availability of Output Measures	-.0914	.3255	-.0379	-.28	.7799

$F(2,54) = .51$, $p = .6015$, $R^2 = .0186$

Relationship of Task Complexity, Availability of Output Controls, and Hospital to Output Control (Department level)

Variable	*B*	SE(*B*)	β	T	p (T)
Task Complexity	.0535	.0488	.1551	1.10	.2779
Availability of Output Measures	-.0670	.3302	-.0277	-.20	.8401
Hospital	-.2014	.3457	-.0831	-.58	.5625

$F(3,53) = .45$, $p = .7176$, $R^2 = .0249$

Relationship of Task Complexity and Availability of Output Controls to Behavior Control (Department level)

Variable	*B*	SE(*B*)	β	T	p (T)
Task Complexity	-.0433	.0354	-.1642	-1.22	.2266
Availability of Output Measures	-.0118	.2480	-.0064	-.05	.9623

$F(2,54) = .75$, $p = .4773$, $R^2 = .0270$

Relationship of Task Complexity, Availability of Output Controls, and Hospital to Behavior Control (Department level)

Variable	*B*	SE(*B*)	β	T	p (T)
Task Complexity	-.0226	.0359	-.0857	-.63	.5321
Availability of Output Measures	.0506	.2462	.0274	.21	.8358
Hospital	-.5145	.2546	-.2775	-2.02	.0483

$F(3,53) = 1.89$, $p = .1424$, $R^2 = .0967$

TABLE 17

EFFECTS OF THE AVAILABILITY OF OUTPUT MEASURES AND TASK COMPLEXITY ON OUTPUT AND BEHAVIOR CONTROL

Interaction of Availability of Output Measures and Task Complexity on Output Control

Variable	Sum of Squares	Mean Square	F(1,53)	p
Effect (1x2)	12.62	12.63	9.94	.0027
Error	67.33	1.27		

Availability of Output Measures	Task Complexity	Output Control
YES	LOW	4.72
YES	HIGH	4.22
NO	LOW	3.54
NO	HIGH	4.94

Interaction of Availability of Output Measures and Task Complexity on Behavior Control

Variable	Sum of Squares	Mean Square	F(1,53)	p
Effect (1x2)	2.42	2.42	2.78	.1014
Error	46.09	.87		

Availability of Output Measures	Task Complexity	Behavior Control
YES	LOW	5.73
YES	HIGH	5.23
NO	LOW	5.26
NO	HIGH	5.58

Interaction of Availability of Output Measures and Task Complexity on Behavior and Output Control

Variable	Wilks' Lambda	Rao's R	p
Output Measures	.99	.29	.7498
Task Complexity	.93	1.96	.1511
Interaction*	.94	4.88	.0114

* $p < .05$

Availability of Output Measures	Task Complexity	Output Control	Behavior Control
YES	LOW	4.71	5.73
YES	HIGH	4.22	5.23
NO	LOW	3.54	5.26
NO	HIGH	4.95	5.58

control. Given the skewness of the behavior control variable, this result was to be expected.

In summary, the results provide little support for the hypothesized relationships among task complexity, availability of output measures, and behavior or output control. For this sample, behavior control appears to be preferred to output control regardless of the levels of task complexity or the availability of output measures.

Hypothesis Six

The first part of this hypothesis stated that under conditions of low task complexity, if the level of input uncertainty was high, output controls would be used. The correlation between input uncertainty and output controls under conditions of low task complexity, therefore, should have been positive and significant. Results showed it to be positive but not significant ($r = .0345$, $p = .8698$). A multiple regression model with task complexity and input uncertainty as the independent variables and output control as the dependent variable was not significant ($R^2 = .02$, $p = .5696$, see Table 18). When the hospital variable was added to the model, there was no change in the pattern of the results (see Table 18). A MANOVA model was used to examine the relationships. The task complexity variable was categorized as high/low based on the mean, while the input uncertainty variable was categorized as high/medium/low with the breakpoints at the 25th and 75th percentiles. When examining the results using this model (see Table 19), it appeared that when task complexity was low, output controls were used more when input uncertainty was either high or low, but not in the medium condition. Conversely, when task uncertainty was high, output controls were used most frequently when input uncertainty was medium. This implies that a second order equation for the input uncertainty variable might more accurately fit the data.

TABLE 18

MULTIPLE REGRESSION ANALYSIS
RELATIONSHIP OF TASK COMPLEXITY
AND INPUT UNCERTAINTY TO OUTPUT CONTROL

Relationship of Task Complexity and Input Uncertainty to Output Control

Variable	*B*	SE(*B*)	β	T	p (T)
Task Complexity	.0463	.0457	.1352	1.01	.3154
Input Uncertainty	.0111	.0324	.0459	.3438	.7323

$F(2,55) = .56$, $p = .5696$, $R^2 = .0203$

Relationship of Task Complexity, Input Uncertainty, and Hospital to Output Control

Variable	*B*	SE(*B*)	β	T	p (T)
Task Complexity	.0556	.0481	.1627	1.16	.2527
Input Uncertainty	.0139	.0329	.0573	.42	.6738
Hospital	-.2207	.3402	-.0919	-.65	.5193

$F(3,54) = .52$, $p = .6736$, $R^2 = .0278$

Relationship of Task Complexity and Input Uncertainty (Second Order) to Output Control

Variable	*B*	SE(*B*)	β	T	p (T)
Task Complexity	.0463	.0457	.1352	1.01	.3154
$(\text{Input Uncertainty})^2$	.0001	.0005	.0383	.29	.7755

$F(2,55) = .55$, $p = .58$, $R^2 = .0196$

TABLE 19

MANOVA MODEL
EFFECTS OF TASK COMPLEXITY AND AVAILABILITY OF OUTPUT MEASURES ON BEHAVIOR AND OUTPUT CONTROL

Interaction of Availability of Output Measures and Task Complexity with Behavior and Output Control

Variable	Wilks' Lambda	Rao's R	p
Availability of Output Measures	.9890	.2895	.7498
Task Complexity	.9299	1.9599	.1511
Interaction (1x2)	.8419	4.8812	.0114

Department Level; df (2,52)

Output Measures Available?	Task Complexity	Output Control	Behavior Control
YES	LOW	4.72	5.74
YES	HIGH	4.22	5.23
NO	LOW	3.64	5.26
NO	HIGH	4.95	5.59

When placed in the regression model, however, the results remained nonsignificant ($R^2 = .02$, $p = .58$, see Table 18).

The second portion of the hypothesis stated that under conditions of low task uncertainty, if the level of input uncertainty was low, behavioral controls would be used. This required a significant negative correlation between input uncertainty and behavior control under conditions of low task uncertainty. The correlation was positive but not significant ($r = .1539$, $p = .4627$). Using the MANOVA model as described above but with behavior control as the dependent variable, no significant effects emerged (see Table 20).

The hypothesis, therefore, was not supported by the data. Task complexity and input uncertainty were not linearly related to the use of output or behavior controls in this sample.

Hypothesis Seven

This hypothesis predicted that at the department level, under a bureaucratic MCS, when output measures are not readily available or are expensive to obtain, behavioral controls will be used. In this situation, a positive correlation between the cost of output measures and behavior control was expected. The correlation between cost of output measures and behavior control was examined under three conditions: (1) no sample restrictions ($n = 58$), (2) only those cases where bureaucratic control was rated high ($n = 33$), and (3) only those cases where bureaucratic control was high and output measures were not available ($n = 17$). With no restrictions, the correlation was not significant ($r = -.0587$, $p = .6952$). In the high bureaucracy condition, the correlation was also nonsignificant ($r = -.0995$, $p = .5945$). The same is true using only those cases where bureaucratic control was high and output measures were not available ($r = -.0622$, $p = .8191$).

TABLE 20

MANOVA MODEL
EFFECTS OF INPUT UNCERTAINTY AND TASK COMPLEXITY ON OUTPUT CONTROL

Interaction of Input Uncertainty and Task Complexity with Output Control

Variable	MS Effect	MS Error	F (2,52)	p
Input Uncertainty	.4994	1.4032	.36	.7022
Task Complexity	2.8793	1.4032	2.05	.1580
Interaction (1x2)	3.4429	1.4032	2.45	.0959

Input Uncertainty	Task Complexity	Output Control
LOW	LOW	4.38
LOW	HIGH	4.55
MED	LOW	3.48
MED	HIGH	4.88
HIGH	LOW	4.56
HIGH	HIGH	4.36

A multiple regression model with availability of output measures and cost of output measures as the independent variables and behavior control as the dependent variable was not significant ($R^2 = .0318$, $p = .4909$, see Table 21).

This relationship was further examined using a MANOVA design with availability of output measures and the cost of output measures (categorized as high/low based on the mean) as the independent variables and behavior control as the dependent variable; there were no significant effects (see Table 21). The hypothesis implies that behavioral control will be highest when output measures are not available or when the cost of output measures is high. Inspection of the means, however, shows that the use of behavior control tends to increase (although not significantly) when output measures are available as opposed to when output measures are not available, especially when the cost of output measures is either low or medium. When the cost of output measures is high, the availability of output measures has little effect on the use of behavior control. In addition, inspection of the means shows that behavior control is used more than output control regardless of the availability of output measures or their cost. This hypothesis, therefore, is not supported for this sample.

Hypothesis Eight

If an department uses a cultural control system, and suitable professionals are available at a reasonable cost, it is hypothesized that professional controls will be used. Part A of the hypothesis stated that if professionals were available to the organization, and their professional socialization was congruent with the values of the organization, then professional supervisory control mechanisms would be used. Several variables were used as measures of the availability of professionals: the number of applicants for a position, whether the supply of applicants was increasing or decreasing, and whether compensation was increasing or decreasing. Professional socialization was

TABLE 21

RELATIONSHIP OF THE COST AND AVAILABILITY OF OUTPUT MEASURES TO OUTPUT AND BEHAVIOR CONTROL

Relationship of Availability and Cost of Output Measures on Behavior Control

Variable	*B*	SE(*B*)	β	T	p (T)
Availability of Output Measures	-.2666	.2347	-.1821	1.14	.2622
Cost of Output Measures	.0010	.0154	.0103	.06	.9489

$F(2,44) = .72$, $p = .49$, $R^2 = .0318$

Interaction of Availability and Cost of Output Measures on Behavior Control

	MS Effect	MS Error	F(1,41)	p
1. Availability	.42	.58	.74	.3935
2. Cost	.23	.58	.40	.3727
Interaction (1x2)	.24	.58	.41	.6669

Availability of Output Measures	Cost of Output Measures	Behavior Control
YES	LOW	5.72
YES	MED	5.73
YES	HIGH	5.44
NO	LOW	5.04
NO	MED	5.54
NO	HIGH	5.44

Interaction of Cost and Availability of Output Measures on Behavior and Output Control

Variable	MS Effect	MS Error	F (2,41)	p
Output Control	.34	1.51	.22	.7991
Behavior Control	.24	.58	.41	.6669

Availability of Output Measures	Cost of Output Measures	Output Control	Behavior Control
YES	LOW	4.97	5.73
YES	MED	4.60	5.73
YES	HIGH	3.63	5.44
NO	LOW	4.54	5.04
NO	MED	4.54	5.54
NO	HIGH	4.25	5.44

measured by a professional values scale and by the goal congruence scales. The number of years of professional training was also measured, and served as an indicator of professional status. At the department level, using a forward stepwise multiple regression model with the above-mentioned variables as the independent variables and professional control as the dependent variable, the model was significant ($R^2 = .34$, $p = .0002$, see Table 22). Four variables entered into the model: actual/perceived goal congruence, compensation, professional values, and number of applicants. This provides support for the hypothesis, in that professional control is used more frequently when compensation is increasing (allowing for increased independence for professionals) and goal incongruence is low (implying goals compatible with those of the organization).

Using the same model at the individual level, with no exclusions, also yielded strong support for the hypothesis ($R^2 = .2095$, $p < .0001$, see Table 22). Four variables entered the model: professional values, compensation, actual/perceived goal congruence , and professional training. The first part of the hypothesis, therefore, received strong support at both the department and individual level. Goal congruence, compensation, and professional training were related to the use of professional control at both levels.

The second part of the hypothesis predicted that when professionals with requisite values are not available to the organization, then the organization will use ritual supervisory control methods. Using the same model at the department level but with ritual control as the dependent variable (see Table 23), four variables entered into the model ($R^2 = .3307$, $p = .0002$): goal congruence, professional values, compensation, and number of years of professional training. The results were similar at the individual level (see Table 23). Professional values and compensation entered

TABLE 22

FORWARD STEPWISE REGRESSION ANALYSIS RELATIONSHIP OF THE AVAILABILITY OF PROFESSIONALS AND PROFESSIONAL SOCIALIZATION/VALUES WITH PROFESSIONAL CONTROL

Department Level

Relationship of the Availability of Professionals and Professional Socialization/Values with Professional Control (Department level)

Variable	*B*	SE(*B*)	β	T	p (T)
Goal Congruence (1)	-.0640	.0200	-.4092	-3.19	.0024
Compensation	.4296	.1904	.2613	2.26	.0282
Professional Values	.0497	.0345	.1804	1.44	.1555
Change in Applicants	-.0158	.0113	-.1774	-1.40	.1679

$F(4,53) = 6.68$, $p = .0002$, $R^2 = .3353$

Individual Level

Relationship of the Availability of Professionals and Professional Socialization/Values with Professional Control (Individual level)

Variable	*B*	SE(*B*)	β	T	p (T)
Professional Values	.0778	.0193	.2753	4.03	.0001
Compensation	.3786	.1253	.2044	3.02	.0029
Goal Congruence (1)	-.0366	.0120	-.2091	-3.06	.0026
Professional Training	.0609	.0231	.1784	2.63	.0092

$F(4,175) = 11.59$, $p < .0001$, $R^2 = .2095$

TABLE 23

FORWARD STEPWISE REGRESSION ANALYSIS RELATIONSHIP OF THE AVAILABILITY OF PROFESSIONALS AND PROFESSIONAL SOCIALIZATION/VALUES WITH RITUAL CONTROL

Department Level

Relationship of the Availability of Professionals and Professional Socialization/Values with Ritual Control (Department level)

Variable	*B*	SE(*B*)	β	T	p (T)
Goal Congruence	-.0557	.0194	-.3501	-2.87	.0059
Professional Values	.0690	.0337	.2466	2.05	.0454
Compensation	.3027	.1936	.1810	1.56	.1239
Professional Training	-.0638	.0493	-.1515	-1.30	.2005

$F(4,53) = 6.55$, $p = .0002$, $R^2 = .3307$

Individual Level

Relationship of the Availability of Professionals and Professional Socialization/Values with Ritual Control (Individual level)

Variable	*B*	SE(*B*)	β	T	p (T)
Professional Values	.1040	.0190	.3863	5.49	.0001
Compensation	.4991	.1710	.2828	2.92	.0040
Goal Congruence (1)	-.0194	.0115	-.1165	-1.69	.0928
Supply of Professionals	.2356	.1456	.1603	1.62	.1073
Number of Applicants	.0186	.0086	.0887	1.27	.2070

$F(5,174) = 9.28$, $p < .0001$, $R^2 = .2104$

the model and were significant, actual/perceived goal congruence approached significance, and the supply of professionals and number of applicants entered the model but were not significant. These results did not support this portion of the hypothesis.

Hypothesis Nine

The next three hypotheses explored the congruencies among management control systems and antecedents, supervisory control methods and antecedents, and the outcome variables of job satisfaction, performance, and organizational commitment. First it was necessary to test whether the choice of a supervisory control method was consistent with the choice of management control system. For a bureaucratic MCS, the strongest relationships should be observed with output control and behavior control. This was examined using a multiple regression model with bureaucratic control as the dependent variable and output, behavior, professional, and ritual controls as the independent variables. The model was significant ($R^2 = .2345$, $p < .0001$, see Table 24). As expected, output and behavior controls were significantly related to bureaucratic control and had positive beta coefficients, while professional and ritual controls were non-significant with negative beta coefficients.

A similar pattern was hypothesized to exist for cultural control, with ritual and professional controls significantly related to cultural control, and no relationship with output and behavior controls. However, it did not. The regression model was significant but weak ($R^2 = .0670$, $p = .0179$, see Table 25). Cultural control was most strongly related to behavior control; no other independent variable was significant. Moderated regression analysis was used for testing the fit of the components of the model and the relationship of fit to job satisfaction. In moderated regression analysis, the product of the independent variable and the moderator variable becomes an

TABLE 24

REGRESSION ANALYSIS
RELATIONSHIP OF SUPERVISORY CONTROL METHODS TO BUREAUCRATIC CONTROL

Relationship of Supervisory Control Methods to Bureaucratic Control (Individual Level)

Variable	*B*	SE(*B*)	β	T	p (T)
Output Control	1.1849	.3523	.2369	3.36	.0009
Behavior Control	2.4130	.5012	.3851	4.81	.0001
Ritual Control	-.2044	.5261	-.0344	-.39	.6981
Professional Control	-.1968	.4936	-.0348	-.40	.6907

$F(4,174) = 13.33$, $p < .0001$, $R^2 = .2345$

TABLE 25

REGRESSION ANALYSIS
RELATIONSHIP OF SUPERVISORY CONTROL METHODS TO CULTURAL CONTROL

Relationship of Supervisory Control Methods to Cultural Control (Individual Level)

Variable	*B*	SE(*B*)	β	T	p (T)
Output Control	-.1536	.4639	-.0260	-.33	.7409
Behavior Control	1.7500	.6544	.2376	2.68	.0081
Ritual Control	.8864	.6896	.1267	1.29	.2003
Professional Control	-.9156	.6467	-.1380	-1.42	.1586

$F(4,171) = 3.07$, $p = .0179$, $R^2 = .0670$

interaction term which measures the influence of the fit of the independent variable with the moderator variable on the dependent variable. A series of regression models is used to test the relationships among the independent variable, moderator variable, interaction term, and a dependent variable. The process requires entering the independent variables into the equation first, followed by the moderator variable and then the interaction term. If the interaction term is positive and significant, then the positive influence of the independent variable on the dependent variable is larger when the moderator variable is large than when it is small. If the interaction term is negative and significant, then the influence of the independent variable on the dependent variable is smaller when the moderator variable is large than when it is small.

Hypothesis Nine stated that if the fits among perceptions of the contextual and structural factors and the organization's management control systems are congruent, and the fits among perceptions of its management control systems and supervisory control methods are congruent, then the level of perceived job satisfaction will be higher than when the systems are not congruent. Since job satisfaction was measured at the individual level, the hypothesis was tested at that level.

The relationships with job satisfaction of the fits of technology, department size, structure, and the PEU variables with bureaucratic and cultural control were tested first. Tables 26 through 32 contain the results of the statistical analysis; Table 33 summarizes the findings of these tests. This analysis shows that the fits of bureaucratic control with department size, mechanistic structure, and state certainty have significant relationships to job satisfaction; the fits of mechanistic structure and state certainty with bureaucratic control are consistent with the expected direction of the relationship as specified in the comprehensive control model. The fits of bureaucratic control with technology, dynamism, effect certainty, and response certainty were not significant. The fits of cultural control with department size and

TABLE 26

MODERATED REGRESSION ANALYSIS
RELATIONSHIP OF TECHNOLOGY AND MCS TO JOB SATISFACTION

Relationship of Technology and Bureaucratic Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Technology	.0541	10.0139***	.1271***	10.0139***	1,175
Technology	.1263	12.5804***	.0814**	4.0302**	1,174
Bureaucratic Control			.2289***	20.7710***	1,174
Technology	.1315	8.7305***	.2672	2.0249	1,173
Bureaucratic Control			.4861*	2.2418	1,173
TECH x BC			-.0054	21.6297***	1,173

* p < .10; ** p < .05; ***p < .01

Relationship of Technology and Cultural Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Technology	.0532	9.7181***	.1270***	9.7181***	1,173
Technology	.3655	49.5298***	.0898***	7.1055***	1,172
Cultural Control			.3879***	88.8194***	1,172
Technology	.3710	33.6190***	.3439***	7.1055***	1,171
Cultural Control			.6113	88.8194***	1,171
TECH x CC			-.0047	1.5060	1,171

* p < .10; ** p < .05; ***p < .01

TABLE 27

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF DEPARTMENT SIZE AND MCS TO JOB SATISFACTION

Relationship of Department Size and Bureaucratic Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Department Size	.0041	.6674	-.0493	.6674	1,163
Department Size	.0943	8.4344**	-.1213**	4.0332**	1,162
Bureaucratic Control			.2350***	12.6012** *	1,162
Department Size	.1400	8.7351**	-1.0042***	4.0332**	1,161
Bureaucratic Control			.0080	12.6012** *	1,161
SIZE x BC			.0241***	8.5504**	1,161

* p < .10; ** p < .05; ***p < .01

Relationship of Department Size and Cultural Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Department Size	.0032	.5173	-.0493	.5173	1,161
Department Size	.3671	46.4084** *	.0191	.1503	1,160
Cultural Control			.3801***	93.1582** *	1,160
Department Size	.3822	32.7945** *	-.4853*	3.4747*	1,159
Cultural Control			.2754***	93.1582** *	1,159
SIZE x CC			.0095**	.5598	1,159

* p < .10; ** p < .05; ***p < .01

TABLE 28

MODERATED REGRESSION ANALYSIS
RELATIONSHIP OF STRUCTURE AND MCS TO JOB SATISFACTION

Relationship of Structure and Bureaucratic Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Structure	.0042	.7314	.0418	.7314	1,174
Structure	.1192	11.7075***	.0754	2.6180	1,173
Bureaucratic Control			.0588***	20.6054***	1,173
Structure	.1418	9.4730***	.4913**	2.6180	1,173
Bureaucratic Control			.7929***	20.6054***	1,173
STRUC x BC			-.0119**	4.5267**	1,173

* p < .10; ** p < .05; ***p < .01

Relationship of Structure and Cultural Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Structure	.0040	.6862	.0407	.6862	1,172
Structure	.3481	45.6535***	-.0622	2.2654	1,171
Cultural Control			.0442***	88.3913***	1,171
Structure	.3500	30.5168***	.1037	.1918	1,170
Cultural Control			.5559***	88.3913***	1,170
STRUC x CC			-.0031	2.5861	1,170

* p < .10; ** p < .05; ***p < .01

TABLE 29

MODERATED REGRESSION ANALYSIS
RELATIONSHIP OF DYNAMISM AND MCS TO JOB SATISFACTION

Relationship of Dynamism and Bureaucratic Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Dynamism	.0886	16.7183***	-.2132***	16.7183***	1,172
Dynamism	.1727	17.8400***	-.1998***	16.0232***	1,171
Bureaucratic Control			.2358***	18.0933***	1,171
Dynamism	.1752	12.0328***	-.3990	16.0232***	1,170
Bureaucratic Control			.0856	18.0933***	1,170
DYN x BC			.0055	.5049	1,170

* p < .10; ** p < .05; ***p < .01

Relationship of Dynamism and Cultural Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Dynamism	.0690	16.1859***	-.2122***	16.1859***	1,171
Dynamism	.3535	46.2133***	-.0949**	4.1347**	1,170
Cultural Control			.3688***	86.6934***	1,170
Dynamism	.3724	33.2269***	-.6669**	4.1347**	1,169
Cultural Control			.0835	86.6934***	1,169
DYN x CC			.0104**	5.0430**	1,169

* p < .10; ** p < .05; ***p < .01

TABLE 30

MODERATED REGRESSION ANALYSIS
RELATIONSHIP OF EFFECT CERTAINTY AND MCS TO JOB SATISFACTION

Relationship of Effect Certainty and Bureaucratic Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Effect Certainty	.0594	10.7405***	.3488***	10.7405***	1,171
Effect Certainty	.1490	14.7924***	.2556**	6.0466**	1,170
Bureaucratic Control			.0610***	22.8596***	1,170
Effect Certainty	.1548	10.2539***	-.3080	2.8453*	1,169
Bureaucratic Control			-.0016	.0000	1,169
EFF x BC			.0164	27.7977***	1,169

* p < .10; ** p < .05; ***p < .01

Relationship of Effect Certainty and Cultural Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Effect Certainty	.0600	10.7152***	.3517***	10.7152***	1,168
Effect Certainty	.3823	51.6779***	.2195**	6.1556**	1,167
Cultural Control			.4039***	94.3060***	1,167
Effect Certainty	.3872	34.9626***	.7437	6.1556**	1,167
Cultural Control			.5566***	94.3060***	1,167
EFF x CC			-.0100	1.3286	1,167

* p < .10; ** p < .05; ***p < .01

TABLE 31

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF STATE CERTAINTY AND MCS TO JOB SATISFACTION

Relationship of State Certainty and Bureaucratic Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
State Certainty	.0606	10.9685***	-.4163***	10.9685***	1,170
State Certainty	.1502	14.9295***	-.3561***	8.6947***	1,169
Bureaucratic Control			.2453***	20.2479***	1,169
State Certainty	.1837	12.6041***	-1.8098***	8.6947***	1,168
Bureaucratic Control			-.2598	20.2479***	1,168
STATE x BC			.0417***	6.9093***	1,168

* p < .10; ** p < .05; ***p < .01

Relationship of State Certainty and Cultural Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
State Certainty	.0590	10.5376***	-.4119***	10.5376***	1,168
State Certainty	.3846	52.1852***	-.2949***	8.0921***	1,167
Cultural Control			.4022***	92.3786***	1,167
State Certainty	.3883	35.1311***	-.8337	8.0921***	1,166
Cultural Control			.2898**	92.3786***	1,166
STATE x CC			.0102	1.0141	1,166

* p < .10; ** p < .05; ***p < .01

TABLE 32

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF RESPONSE CERTAINTY AND MCS TO JOB SATISFACTION

Relationship of Response Certainty and Bureaucratic Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Response Certainty	.0030	.5109	-.0778	.5109	1,172
Response Certainty	.1122	10.8026***	.2716***	.9930	1,171
Bureaucratic Control			-.1028	20.6130***	1,171
Response Certainty	.1131	7.2246	.3675	.0344	1,170
Bureaucratic Control			.0866	20.6130***	1,170
RESP x BC			-.0056	1.1333	1,170

* p < .10; ** p < .05; ***p < .01

Relationship of Response Certainty and Cultural Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Response Certainty	.0058	.4849	-.0770	.4849	1,170
Response Certainty	.3602	47.5701***	.0377	.1766	1,169
Cultural Control			.4242***	95.4258***	1,169
Response Certainty	.3680	32.6126***	.6122	.1766	1,168
Cultural Control			.6052***	95.4258***	1,168
RESP x CC			-.0110	2.0861	1,168

* p < .10; ** p < .05; ***p < .01

TABLE 33

MCS/ANTECEDENT FIT AND ITS RELATIONSHIP TO JOB SATISFACTION

Independent Variable	Moderator Variable	Fit related to Job Satisfaction?	Comments
Technology	Bureaucratic Control	No	Each positively related independently
Technology	Cultural Control	No	Each positively related independently
Department Size	Bureaucratic Control	Yes	The negative influence of department size on job satisfaction is greater when bureaucratic control is low than when it is high
Department Size	Cultural Control	Yes	The negative influence of department size on job satisfaction is greater when cultural control is low than when it is high
Structure	Bureaucratic Control	Yes	The positive influence of a mechanistic structure on job satisfaction is greater when bureaucratic control is high than when it is low
Structure	Cultural Control	No	Cultural control is positively associated with job satisfaction independently of structure
Dynamism	Bureaucratic Control	No	Dynamism is negatively related to job satisfaction; bureaucratic control is positively related to job satisfaction
Dynamism	Cultural Control	Yes	The negative influence of dynamism on job satisfaction is greater when cultural control is low than when it is high
Effect Certainty	Bureaucratic Control	No	Effect certainty and bureaucratic control are positively and independently related to job satisfaction
Effect Certainty	Cultural Control	No	Effect certainty and cultural control are positively and independently related to job satisfaction
State Certainty	Bureaucratic Control	Yes	The negative influence of state uncertainty on job satisfaction is greater when bureaucratic control is high than when it is low
State Certainty	Cultural Control	No	State uncertainty is negatively related to job satisfaction; cultural control is positively related to job satisfaction
Response Certainty	Bureaucratic Control	No	Response uncertainty is negatively related to job satisfaction independently of bureaucratic control
Response Certainty	Cultural Control	No	Cultural control positively related to job satisfaction independently of response certainty

dynamism were significant and in the directions specified by the model; the fits of cultural control with technology, organic structure, effect certainty, state certainty, and response certainty were not significant. Together, the results indicate that the fit of technology with MCS does not significantly relate to job satisfaction. The fit of department size with MCS does relate to job satisfaction, as does the fit of structure with bureaucratic control. Two of the fits of the PEU variables with MCS were related to job satisfaction; in the others, the negative relationship of high PEU to job satisfaction outweighed the relationship of fit to job satisfaction.

Tables 34 through 38 contain the results of testing the fits of task complexity and input uncertainty with output and behavior control and the relationship of these fits to job satisfaction. Also tested were the fits of the three types of goal congruence with ritual and professional control and the relationship of these fits to job satisfaction. Table 39 contains a summary of the results. The fit of task complexity and output control with job satisfaction approached significance; the negative influence of task complexity on job satisfaction was higher when output control was high than when it was low. None of the other fits between task complexity or input uncertainty and output or behavior control were significantly related to job satisfaction.

Several of the fits among goal congruence and professional or ritual control were associated with job satisfaction. The fit of all three types of goal congruence with ritual control were related to job satisfaction; the positive influence of goal congruence on job satisfaction was higher when ritual control was high than when it was low. Professional control did not moderate the relationship of actual/perceived goal congruence with job satisfaction, but did moderate the relationship of actual/actual and perceived/perceived goal congruence with job satisfaction. As with ritual control, the positive influence of goal congruence on job satisfaction was higher when professional control was high than when it was low.

TABLE 34

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF TASK COMPLEXITY AND SCM TO JOB SATISFACTION

Relationship of Task Complexity and Output Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Task Complexity	.0990	18.7938***	-.3863***	18.7938***	1,171
Task Complexity	.1126	10.7811***	-.4031***	18.7938***	1,170
Output Control			.4818	2.5934	1,170
Task Complexity	.1290	8.3426***	-.8576***	18.7938***	1,169
Output Control			-1.4708	1.6844	1,169
TASK x OC			.1068*	4.1139**	1,169

* p < .10; ** p < .05; ***p < .01

Relationship of Task Complexity and Behavioral Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Task Complexity	.0990	18.7938***	-.3863***	18.7938***	1,171
Task Complexity	.1983	21.0285***	-.3744***	19.7091***	1,170
Behavior Control			1.6069***	20.1441***	1,170
Task Complexity	.2037	14.4082***	-.8611*	19.7091***	1,169
Behavior Control			.0444	20.1441***	1,169
TASK x BEH			.0864	1.1343	1,169

* p < .10; ** p < .05; ***p < .01

TABLE 35

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF INPUT UNCERTAINTY AND SCM TO JOB SATISFACTION

Relationship of Input Uncertainty and Output Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Input Uncertainty	.0000	.0045	.0045	.0045	1,167
Input Uncertainty	.0063	.5255	-.0067	.0030	1,166
Output Control			.3259	1.0542	1,166
Input Uncertainty	.0122	.6809	-.1946	.4049	1,165
Output Control			-1.2087	.5900	1,165
INP x OC			.0458	1.0551	1,165

* p < .10; ** p < .05; ***p < .01

Relationship of Task Complexity and Behavioral Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Input Uncertainty	.0000	.0045	.0045	.0045	1,167
Input Uncertainty	.1034	9.5756***	-.0276	.1887	1,166
Behavior Control			1.6539***	19.0551***	1,166
Input Uncertainty	.1066	6.5628***	.1704	.4084	1,165
Behavior Control			2.9104*	19.0551***	1,165
INP x BEH			-.0367	.3661	1,165

* p < .10; ** p < .05; ***p < .01

TABLE 36

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF GOAL CONGRUENCE (1) AND SCM TO JOB SATISFACTION

Relationship of Goal Congruence (Actual/Perceived) and Ritual Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Goal Congruence (1)	.0800	15.1228***	-1.7683***	15.1228***	1,174
Goal Congruence (1)	.1306	12.9976***	-1.5215***	15.1228***	1,173
Ritual Control			1.0986**	10.0830***	1,173
Goal Congruence (1)	.1589	10.8346***	-4.6862***	15.1228***	1,172
Ritual Control			.9938***	10.0830***	1,172
GC1 x RC			.7558**	5.7889**	1,172

* p < .10; ** p < .05; ***p < .01

Relationship of Goal Congruence (actual/perceived) and Professional Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Goal Congruence (1)	.0800	15.1228***	-1.7693***	15.1228***	1,174
Goal Congruence (1)	.0833	7.8645***	-1.6872***	15.1228***	1,173
Professional Control			.2720	.6376	1,173
Goal Congruence (1)	.0917	5.7887***	-2.7119***	15.1228***	1,172
Professional Control			.2521	.5485	1,172
CG1 x PC			.3373	1.6797	1,172

* p < .10; ** p < .05; ***p < .01

TABLE 37

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF GOAL CONGRUENCE (2) AND SCM TO JOB SATISFACTION

Relationship of Goal Congruence (Actual/Actual) and Ritual Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Goal Congruence (2)	.0188	2.9052*	-.7450*	2.9052*	1,152
Goal Congruence (2)	.0684	5.5399***	-.6565	2.3480	1,151
Ritual Control			.9816***	8.6551***	1,151
Goal Congruence (2)	.1062	5.8383***	-4.2396***	2.3480	1,150
Ritual Control			.9235***	8.6551***	1,150
GC2 x RC			.7281**	6.3431**	1,150

* p < .10; ** p < .05; ***p < .01

Relationship of Goal Congruence (actual/actual) and Professional Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Goal Congruence (2)	.01876	2.9052*	-.7450*	2.9052*	1,152
Goal Congruence (2)	.0283	2.1990	-.6871	2.9052*	1,151
Professional Control			.3914	1.4835	1,151
Goal Congruence (2)	.0566	2.9978**	-2.8705**	2.9052*	1,150
Professional Control			.3206	1.0068	1,150
CG2 x PC			.4899**	5.0045**	1,150

* p < .10; ** p < .05; ***p < .01

TABLE 38

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF GOAL CONGRUENCE (3) AND SCM TO JOB SATISFACTION

Relationship of Goal Congruence (Perceived/Perceived) and Ritual Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Goal Congruence (3)	.0573	9.2354***	-1.3087***	9.2354***	1,152
Goal Congruence (3)	.1084	9.1747***	-1.2768***	9.2354***	1,151
Ritual Control			.9937***	8.6492***	1,151
Goal Congruence (3)	.1481	8.6941	-5.0092***	9.2354***	1,150
Ritual Control			.8350**	6.1493**	1,150
GC3 x RC			.7790***	9.5226***	1,150

* p < .10; ** p < .05; ***p < .01

Relationship of Goal Congruence (Perceived/Perceived) and Professional Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Goal Congruence (3)	.0573	9.2354***	-1.3087***	9.2354***	1,152
Goal Congruence (3)	.0659	5.3248***	-1.2672***	9.2354***	1,151
Professional Control			.3706	1.3905	1,151
Goal Congruence (3)	.1188	6.7396***	-4.3039***	9.2354***	1,150
Professional Control			.0980	.0940	1,150
CG3 x PC			.7040***	10.4374***	1,150

* p < .10; ** p < .05; ***p < .01

TABLE 39

SCM/ANTECEDENT FIT AND ITS RELATIONSHIP TO JOB SATISFACTION

Independent Variable	Moderator Variable	Fit related to Job Satisfaction?	Comments
Task Complexity	Output Control	approaches significance	The negative influence of task complexity on job satisfaction is higher when output control is high than when it is low
Task Complexity	Behavior Control	No	Task complexity is negatively related to job satisfaction; behavior control is positively related to job satisfaction
Input Uncertainty	Output Control	No	Neither related to job satisfaction
Input Uncertainty	Behavior Control	No	Behavior control related to job satisfaction independent of input uncertainty
Goal Congruence (actual/perceived)	Ritual Control	Yes	The positive influence of goal congruence on job satisfaction is greater when ritual control is high than when it is low
Goal Congruence (actual/perceived)	Professional Control	No	Goal congruence positively related to job satisfaction independent of professional control
Goal Congruence (actual/actual)	Ritual Control	Yes	The positive influence of goal congruence on job satisfaction is greater when ritual control is high than when it is low
Goal Congruence (actual/actual)	Professional Control	Yes	The positive influence of goal congruence on job satisfaction is greater when professional control is high than when it is low
Goal Congruence (perceived/perceived)	Ritual Control	Yes	The positive influence of goal congruence on job satisfaction is greater when ritual control is high than when it is low
Goal Congruence (perceived/perceived)	Professional Control	Yes	The positive influence of goal congruence on job satisfaction is greater when professional control is high than when it is low

The results provided partial support for the hypothesis, in that the fits of several elements of the model were related to job satisfaction, while the fits of several other elements were not. Generally the fits of MCS antecedents and variables were related to job satisfaction, the fits of bureaucratic SCMs and antecedents were not related to job satisfaction, and the fits of cultural SCMs and antecedents were related to job satisfaction.

The literature provides some support for the hypothesis that job satisfaction will be higher under cultural control than under bureaucratic control (Meglino *et al.*, 1989), but there is also evidence that job satisfaction may be higher under bureaucratic forms of control (Snavely, 1987). These conflicting propositions were tested by means of a moderated regression model with job satisfaction as the dependent variable, cultural control and bureaucratic control as the independent variables, and the interaction of bureaucratic and cultural control as an independent variable. The resulting model was significant (Table 40). Both bureaucratic control and cultural control were significantly related to job satisfaction, while the interaction of bureaucratic and cultural control was not. The regression coefficient for cultural control, however, was greater than that for bureaucratic control, implying that cultural control has a stronger relationship to job satisfaction than does bureaucratic control.

Hypothesis Ten

Hypothesis ten stated that if the fits between contextual and structural factors and the organization's management control systems were congruent, and the fits between its management control systems and supervisory control methods were congruent, then the level of department performance would be higher than when the systems were not congruent. This was tested at the department level, since

TABLE 40

MODERATED REGRESSION ANALYSIS
RELATIONSHIP OF BUREAUCRATIC AND CULTURAL CONTROL TO JOB SATISFACTION

Relationship of Bureaucratic and Cultural Control to Job Satisfaction (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Bureaucratic Control	.1077	20.8792***	.2666***	20.8792***	1,173
Bureaucratic Control	.3748	51.5506***	.1582***	9.7760***	1,172
Cultural Control			.3679***	88.8194***	1,172
Bureaucratic Control	.3784	34.6947***	.4000	9.7760***	1,171
Cultural Control			.5203***	88.8194***	1,171
BC x CC			-.0047	.9894	1,171

* p < .10; ** p < .05; ***p < .01

performance data was collected at that level. Moderated regression analysis was used to test these hypothesized relationships.

Tables 41 through 47 contain the results of testing the relationships with performance of MCS/antecedent fit; the results are summarized in Table 48. Only two of the interactions had a significant relationship with performance. The interaction of technology and bureaucratic control was significantly related to performance; performance was perceived to be higher when technology was routine and bureaucratic control was high. The interaction of structure and bureaucratic control was also related to perceived performance; department performance was perceived to be higher when bureaucratic control was high and the structure was mechanistic.

Tables 49 through 53 document the results of testing the relationship with performance of SCM/antecedent fit; the results are summarized in Table 54. None of the fits were significantly related to perceived department performance. The results showed that actual/perceived goal congruence was positively related to perceived department performance, while actual/actual goal congruence was negatively related to perceived department performance, but independently of the SCM in use. Ritual control and professional control were negatively related to perceived department performance, but independently of goal congruence.

The fit of the model, therefore, has little relation to perceived department performance, although the fit of routine technology and bureaucratic control was positively associated with performance, as was the fit of mechanistic structure with bureaucratic control. Instead, actual/perceived goal congruence appears to be positively related to perceived department performance, actual/actual goal congruence is negatively related to perceived department performance, and ritual and professional controls are negatively related to perceived department performance.

TABLE 41

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF TECHNOLOGY AND MCS TO DEPARTMENT PERFORMANCE

Relationship of Technology and Bureaucratic Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Technology	.0325	1.8472	.0693	1.8472	1,55
Technology	.0440	1.2414	.0530	1.8472	1,54
Bureaucratic Control			.0504	.6474	1,54
Technology	.1200	2.4101*	.6367**	1.8472	1,53
Bureaucratic Control			.7884**	.6474	1,53
TECH x BC			-.0167**	4.35829**	1,53

* p < .10; ** p < .05; ***p < .01

Relationship of Technology and Cultural Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Technology	.0325	1.8472	.0693	1.8472	1,55
Technology	.0529	1.5073	.0762	1.8472	1,54
Cultural Control			-.0609	1.1618	1,54
Technology	.0715	1.3605	.4961	1.8472	1,53
Cultural Control			.2952	.7115	1,53
TECH x CC			-.0075	1.5231	1,53

* p < .10; ** p < .05; ***p < .01

TABLE 42

MODERATED REGRESSION ANALYSIS
RELATIONSHIP OF DEPARTMENT SIZE AND MCS TO DEPARTMENT PERFORMANCE

Relationship of Department Size and Bureaucratic Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Department Size	.0079	.4355	-.0390	.4355	1,55
Department Size	.0407	1.1468	-.0614	1.0154	1,54
Bureaucratic Control			.0855	1.2778	1,54
Department Size	.0556	1.0408	.2700	.5396	1,53
Bureaucratic Control			.1798	1.2778	1,53
SIZE x BC			-.0092	1.3198	1,53

* p < .10; ** p < .05; ***p < .01

Relationship of Department Size and Cultural Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Department Size	.0079	.4355	-.0390	.4355	1,55
Department Size	.0253	.7007	-.0468	.6151	1,54
Cultural Control			-.0564	.7918	1,54
Department Size	.0269	.4881	.0781	.0332	1,53
Cultural Control			-.0287	.6453	1,53
SIZE x CC			-.0024	.8172	1,53

* p < .10; ** p < .05; ***p < .01

TABLE 43

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF STRUCTURE AND MCS TO DEPARTMENT PERFORMANCE

Relationship of Structure and Bureaucratic Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Structure	.0027	.1489	-.0230	.1489	1,55
Structure	.0247	.6838	-.0198	.1105	1,54
Bureaucratic Control			.0674	1.2778	1,54
Structure	.0964	1.8847	-.4377**	.1105	1,53
Bureaucratic Control			-.4570*	1.2778	1,53
STRUC x BC			.0130**	4.2051**	1,53

* p < .10; ** p < .05; ***p < .01

Relationship of Structure and Cultural Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Structure	.0027	.1489	-.0230	.1489	1,55
Structure	.0142	.7918	-.0505	.7918	1,54
Cultural Control			.0000	.0000	1,54
Structure	.0167	.2992	.1051	.1264	1,53
Cultural Control			.0338	.7918	1,53
STRUC x CC			-.0020	.0062	1,53

* p < .10; ** p < .05; ***p < .01

TABLE 44

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF DYNAMISM AND MCS TO DEPARTMENT PERFORMANCE

Relationship of Dynamism and Bureaucratic Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Dynamism	.0012	.0709	-.0191	.0709	1,55
Dynamism	.0235	.6511	-.0155	.0466	1,54
Bureaucratic Control			.0678	1.2778	1,54
Dynamism	.0270	.4908	-.2301	.0466	1,53
Bureaucratic Control			-.0899	1.2778	1,53
DYN x BC			.0060	.1897	1,53

* p < .10; ** p < .05; ***p < .01

Relationship of Dynamism and Cultural Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Dynamism	.0012	.0709	-.0191	.0709	1,55
Dynamism	.0192	.5383	-.0392	.2752	1,54
Cultural Control			-.0589	.7918	1,54
Dynamism	.0192	.3459	-.0562	.2752	1,53
Cultural Control			-.0672	.7918	1,53
DYN x CC			.0003	.0006	1,53

* p < .10; ** p < .05; ***p < .01

TABLE 45

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF EFFECT CERTAINTY AND MCS TO DEPARTMENT PERFORMANCE

Relationship of Effect Certainty and Bureaucratic Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Effect Certainty	.0214	1.2021	-.1465	1.2021	1,55
Effect Certainty	.0582	1.6672	-.1944	2.0325	1,54
Bureaucratic Control			.0897	1.2778	1,54
Effect Certainty	.0594	1.1162	.0477	.0027	1,53
Bureaucratic Control			.1962	1.2778	1,53
EFF x BC			-.0069	2.1053	1,53

* p < .10; ** p < .05; ***p < .01

Relationship of Effect Certainty and Cultural Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Effect Certainty	.0214	1.2021	-.1465	1.2021	1,55
Effect Certainty	.0327	.9139	-.1370	1.2021	1,54
Cultural Control			-.0453	.6337	1,54
Effect Certainty	.0622	1.1716	-1.4525	1.9949	1,53
Cultural Control			-.4203	.0395	1,53
EFF x CC			.0254	1.4787	1,53

* p < .10; ** p < .05; ***p < .01

TABLE 46

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF STATE CERTAINTY AND MCS TO DEPARTMENT PERFORMANCE

Relationship of State Certainty and Bureaucratic Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
State Certainty	.0109	.6063	-.1186	.6063	1,55
State Certainty	.0272	.7541	-.0787	.2479	1,54
Bureaucratic Control			.0601	1.2778	1,54
State Certainty	.0301	.5489	-.4243	.2479	1,53
Bureaucratic Control			-.0671	1.2778	1,53
STATE x BC			.0101	.1618	1,53

* p < .10; ** p < .05; ***p < .01

Relationship of State Certainty and Cultural Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
State Certainty	.0109	.6063	-.1186	.6063	1,55
State Certainty	.0312	.8703	-.1512	.9494	1,54
Cultural Control			-.0616	.7918	1,54
State Certainty	.0465	.8616	-.8978	1.1845	1,53
Cultural Control			-.2176	.3209	1,53
STATE x CC			.0139	1.0881	1,53

* p < .10; ** p < .05; ***p < .01

TABLE 47

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF RESPONSE CERTAINTY AND MCS TO DEPARTMENT PERFORMANCE

Relationship of Response Certainty and Bureaucratic Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Response Certainty	.0349	1.9900	.1896	1.9900	1,55
Response Certainty	.0582	1.6683	.1912	1.9900	1,54
Bureaucratic Control			.0693	1.3355	1,54
Response Certainty	.0601	1.1292	.4571	.1708	1,53
Bureaucratic Control			.2143	.2277	1,53
RESP x BC			-.0078	3.0814*	1,53

* p < .10; ** p < .05; ***p < .01

Relationship of Response Certainty and Cultural Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Response Certainty	.0349	1.9900	.1896	1.9900	1,55
Response Certainty	.0403	1.1350	.1697	1.9900	1,54
Cultural Control			-.0323	.3060	1,54
Response Certainty	.0445	.8213	.5474	1.9900	1,53
Cultural Control			.0808	.1113	1,53
RESP x CC			-.0065	.4293	1,53

* p < .10; ** p < .05; ***p < .01

TABLE 48

MCS/ANTECEDENT FIT AND ITS RELATIONSHIP TO DEPARTMENT PERFORMANCE

Independent Variable	Moderator Variable	Fit related to Department Performance?	Comments
Technology	Bureaucratic Control	Yes	Department performance is perceived to be higher when technology is routine and bureaucratic control is high
Technology	Cultural Control	No	
Department Size	Bureaucratic Control	No	
Department Size	Cultural Control	No	
Structure	Bureaucratic Control	Yes	Department performance is perceived to be higher when bureaucratic control is high and the structure is mechanistic
Structure	Cultural Control	No	
Dynamism	Bureaucratic Control	No	
Dynamism	Cultural Control	No	
Effect Certainty	Bureaucratic Control	No	
Effect Certainty	Cultural Control	No	
State Certainty	Bureaucratic Control	No	
State Certainty	Cultural Control	No	
Response Certainty	Bureaucratic Control	No	
Response Certainty	Cultural Control	No	

TABLE 49

MODERATED REGRESSION ANALYSIS
RELATIONSHIP OF TASK COMPLEXITY AND SCM TO DEPARTMENT PERFORMANCE

Relationship of Task Complexity and Output Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Task Complexity	.0249	1.4017	-.1370	1.4017	1,55
Task Complexity	.0375	1.0523	-.1234	1.4017	1,54
Output Control			-.2909	.7102	1,54
Task Complexity	.0593	1.1129	.3020	.5652	1,53
Output Control			1.5478	.3364	1,53
TASK x OC			-.0979	2.4896	1,53

* p < .10; ** p < .05; ***p < .01

Relationship of Task Complexity and Behavioral Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Task Complexity	.0249	1.4017	-.1370	1.4017	1,55
Task Complexity	.0582	1.6697	-.1626	1.4017	1,54
Behavior Control			-.6145	1.9144	1,54
Task Complexity	.0830	1.5994	-.8988	2.0613	1,53
Behavior Control			-3.1155	.0736	1,53
TASK x BEH			.1260	2.6552	1,53

* p < .10; ** p < .05; ***p < .01

TABLE 50

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF INPUT UNCERTAINTY AND SCM TO DEPARTMENT PERFORMANCE

Relationship of Input Uncertainty and Output Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Input Uncertainty	.0104	.5777	-.0631	.5777	1,55
Input Uncertainty	.0267	.7400	-.0587	.4973	1,54
Output Control			-.3273	.9917	1,54
Input Uncertainty	.0401	.7373	-.4302	.0452	1,53
Output Control			-3.1498	.9102	1,53
INP x OC			.0861	1.2807	1,53

* p < .10; ** p < .05; ***p < .01

Relationship of Task Complexity and Behavioral Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Input Uncertainty	.0104	.5777	-.0631	.5777	1,55
Input Uncertainty	.0294	.8165	-.0457	.2916	1,54
Behavior Control			-.4665	1.3588	1,54
Input Uncertainty	.0399	.7343	-.4268	.7102	1,53
Behavior Control			-2.7321	.1434	1,53
INP x BEH			.0699	1.3788	1,53

* p < .10; ** p < .05; ***p < .01

TABLE 51

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF GOAL CONGRUENCE (1) AND SCM TO DEPARTMENT PERFORMANCE

Relationship of Goal Congruence (Actual/Perceived) and Ritual Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Goal Congruence (1)	.0035	.1911	-.2321	.1911	1,55
Goal Congruence (1)	.1181	3.6148**	-1.2351**	2.8471*	1,54
Ritual Control			-.9726*	4.2401**	1,54
Goal Congruence (1)	.1181	2.3656*	-.9418	2.8471*	1,53
Ritual Control			-1.2322**	4.2401**	1,53
GC1 x RC			-.0090	.0009	1,53

* p < .10; ** p < .05; ***p < .01

Relationship of Goal Congruence (actual/perceived) and Professional Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Goal Congruence (1)	.0035	.1911	-.2321	.1911	1,55
Goal Congruence (1)	.0425	1.1995	-.5770	1.0095	1,54
Professional Control			-.6939	1.3893	1,54
Goal Congruence (1)	.0459	.8609	-.1290	.0119	1,53
Professional Control			-.6187	1.3893	1,53
CG1 x PC			-.1591	1.1938	1,53

* p < .10; ** p < .05; ***p < .01

TABLE 52

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF GOAL CONGRUENCE (2) AND SCM TO DEPARTMENT PERFORMANCE

Relationship of Goal Congruence (Actual/Actual) and Ritual Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Goal Congruence (2)	.1428	7.8281***	1.7410***	7.8281***	1,47
Goal Congruence (2)	.3246	11.0535***	1.3285**	5.4237**	1,46
Ritual Control			-1.5964***	15.2483***	1,46
Goal Congruence (2)	.3253	7.2308***	1.8153	5.5424**	1,45
Ritual Control			-1.5775***	15.2483***	1,45
GC2 x RC			-.1086	.04454	1,45

* p < .10; ** p < .05; ***p < .01

Relationship of Goal Congruence (actual/actual) and Professional Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Goal Congruence (2)	.1428	7.8281***	1.7410***	7.8281***	1,47
Goal Congruence (2)	.2206	6.5096***	1.5043**	7.8281***	1,46
Professional Control			-.9109**	4.5927**	1,46
Goal Congruence (2)	.2270	4.4046***	.4488	.0598	1,45
Professional Control			-.9137**	4.7508**	1,45
CG2 x PC			.2843	8.0365***	1,45

* p < .10; ** p < .05; ***p < .01

TABLE 53

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF GOAL CONGRUENCE (3) AND SCM TO DEPARTMENT PERFORMANCE

Relationship of Goal Congruence (Perceived/Perceived) and Ritual Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Goal Congruence (3)	.0019	.1900	.1835	.1900	1,47
Goal Congruence (3)	.2491	7.6287***	-.2756	.2518	1,46
Ritual Control			-1.8652***	15.2483***	1,46
Goal Congruence (3)	.2645	5.3941***	2.7030	.7530	1,45
Ritual Control			-1.5772***	15.2483***	1,45
GC3 x RC			-.6673	.4447	1,45

* p < .10; ** p < .05; ***p < .01

Relationship of Goal Congruence (Perceived/Perceived) and Professional Control to Department Performance (Department level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Goal Congruence (3)	.0019	.0900	.1835	.0900	1,47
Goal Congruence (3)	.1200	3.1371*	-.2195	.1326	1,46
Professional Control			-1.1460**	6.2571**	1,46
Goal Congruence (3)	.1209	2.0634	.3026	.0146	1,45
Professional Control			-1.0959**	6.2571**	1,45
CG3 x PC			-.1337	.1650	1,45

* p < .10; ** p < .05; ***p < .01

TABLE 54

SCM/ANTECEDENT FIT AND ITS RELATIONSHIP TO DEPARTMENT PERFORMANCE

Independent Variable	Moderator Variable	Fit related to Department Performance?	Comments
Task Complexity	Output Control	No	
Task Complexity	Behavior Control	No	
Input Uncertainty	Output Control	No	
Input Uncertainty	Behavior Control	No	
Goal Congruence (actual/perceived)	Ritual Control	No	Goal congruence is positively related to department performance; ritual control is negatively related
Goal Congruence (actual/perceived)	Professional Control	No	
Goal Congruence (actual/actual)	Ritual Control	No	Goal congruence is negatively related to department performance; ritual control is negatively related
Goal Congruence (actual/actual)	Professional Control	No	Goal congruence is negatively related to department performance; professional control is negatively related
Goal Congruence (perceived/perceived)	Ritual Control	No	Ritual control is negatively related to department performance independently of goal congruence
Goal Congruence (perceived/perceived)	Professional Control	No	Professional control is negatively related to department performance independently of goal congruence

Hypothesis Eleven

The first part of this hypothesis proposed that if the fits between contextual and structural factors and the organization's management control systems are congruent, and the fits between its management control systems and supervisory control methods are congruent, then the level of organizational commitment will be higher than when the systems are not congruent. Two alternative hypotheses were also tested. The first relates to the congruence of the management control system with organizational commitment, and stated that if a department uses cultural controls, organizational commitment will be higher than if it uses bureaucratic controls. The second relates to the congruence of supervisory control methods and commitment, and stated that organizational commitment will be higher when ritual controls are used than when professional controls are used.

The first portion of the hypothesis was tested with a series of moderated regression models. Tables 55 through 61 contain the results of testing the fit of each of the MCS antecedents with the MCS to determine their relationship to organizational commitment. These results are summarized in Table 62. The results indicate that the fits of MCS antecedents and bureaucratic or cultural control had no significant relationships to organizational commitment. Both bureaucratic and cultural control were significantly related to organizational commitment, but independent of the antecedents. Perceived environmental dynamism was negatively related to organizational commitment independently of the MCS. Effect certainty and state certainty were also related to organizational commitment independent of the MCS.

Tables 63 through 67 document the moderated regression analysis used to test the fits of SCM antecedents and SCMs and their relationship to organizational commitment; Table 68 contains a summary of the results. None of the antecedents of

TABLE 55

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF TECHNOLOGY AND MCS TO ORGANIZATIONAL COMMITMENT

Relationship of Technology and Bureaucratic Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Technology	.0080	1.4266	.1243	1.4266	1,175
Technology	.0653	6.1521***	.0227	.0457	1,174
Bureaucratic Control			.5145***	12.3249***	
Technology	.0655	4.0907***	.1130	.0457	1,173
Bureaucratic Control			.6393	12.3249***	1,173
TECH x BC			-.0026	.0353	1,173

* p < .10; ** p < .05; ***p < .01

Relationship of Technology and Cultural Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Technology	.0082	1.4452	.1268	1.4452	1,173
Technology	.1833	19.4177***	.05775	.3571	1,172
Cultural Control			.7343***	38.6211***	1,172
Technology	.1839	12.9233***	.2725	.3571	1,171
Cultural Control			.9229*	38.6211***	1,171
TECH x CC			-.0039	.1298	1,171

* p < .10; ** p < .05; ***p < .01

TABLE 56

MODERATED REGRESSION ANALYSIS
RELATIONSHIP OF DEPARTMENT SIZE AND MCS TO ORGANIZATIONAL COMMITMENT

Relationship of Department Size and Bureaucratic Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Department Size	.0001	.0237	-.0262	.0237	1,165
Department Size	.0509	4.4018**	-.1717	1.0541	1,164
Bureaucratic Control			.4765***	7.7470***	1,164
Department Size	.0654	3.8004**	-1.5215*	1.0541	1,163
Bureaucratic Control			.1291	7.7470***	1,163
SIZE x BC			.0368	2.5163	1,163

* p < .10; ** p < .05; ***p < .01

Relationship of Department Size and Cultural Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Department Size	.0000	.0139	-.0195	.0139	1,162
Department Size	.2018	20.3484***	.1059	.5005	1,161
Cultural Control			.7661***	40.3207***	1,161
Department Size	.2075	13.9610***	-.7340	.8464	1,160
Cultural Control			.5914***	40.3207***	1,160
SIZE x CC			.0158	.8038	1,160

* p < .10; ** p < .05; ***p < .01

TABLE 57

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF STRUCTURE AND MCS TO ORGANIZATIONAL COMMITMENT

Relationship of Structure and Bureaucratic Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Structure	.0021	.3674	.0456	.3674	1,1766
Structure	.0714	6.7271***	.1479	1.5238	1,175
Bureaucratic Control			.5465***	11.8950***	1,175
Structure	.0720	4.5017***	-.0277	.0028	1,175
Bureaucratic Control			.3311	11.8950***	1,175
STRUC x BC			.0146	1.6413	1,175

* p < .10; ** p < .05; ***p < .01

Relationship of Structure and Cultural Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Structure	.0021	.3646	.0746	.3646	1,173
Structure	.1832	19.2850***	-.1088	.8802	1,172
Cultural Control			.7640***	37.7158***	1,172
Structure	.1832	12.7827***	-.0803	.8802	1,171
Cultural Control			.7874	37.7158***	1,171
STRUC x CC			-.0005	.0828	1,171

* p < .10; ** p < .05; ***p < .01

TABLE 58

MODERATED REGRESSION ANALYSIS
RELATIONSHIP OF DYNAMISM AND MCS TO ORGANIZATIONAL COMMITMENT

Relationship of Dynamism and Bureaucratic Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Dynamism	.0310	5.5639**	-.3236**	5.5639**	1,174
Dynamism	.0865	8.1921***	-.3024**	5.1131**	1,173
Bureaucratic Control			.4874***	11.0109***	1,173
Dynamism	.0868	5.4489***	-.4742	5.1131**	1,172
Bureaucratic Control			.3573	11.0109***	1,172
DYN x BC			.0048	.0521	1,172

* p < .10; ** p < .05; ***p < .01

Relationship of Dynamism and Cultural Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Dynamism	.0289	5.0976**	-.3133**	5.0976**	1,171
Dynamism	.1842	19.1885***	-.0900	.4548	1,170
Cultural Control			.7157***	38.0435***	1,170
Dynamism	.1878	13.0296***	-.7358	.4548	1,169
Cultural Control			.3933	38.0435***	1,169
DYN x CC			.0118	.7647	1,169

* p < .10; ** p < .05; ***p < .01

TABLE 59

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF EFFECT CERTAINTY AND MCS TO ORGANIZATIONAL COMMITMENT

Relationship of Effect Certainty and Bureaucratic Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Effect Certainty	.0744	13.8299***	.9724***	13.8299***	1,172
Effect Certainty	.1178	11.4206***	.8354***	13.8299***	1,171
Bureaucratic Control			.4496***	8.4150***	1,171
Effect Certainty	.1239	8.0126***	-.5554	.2066	1,170
Bureaucratic Control			-.1667	.0799	1,170
EFF x BC			1.0833	23.9916***	1,170

* p < .10; ** p < .05; ***p < .01

Relationship of Effect Certainty and Cultural Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Effect Certainty	.0822	15.1302***	1.0444***	15.1302***	1,168
Effect Certainty	.2372	26.1184***	.8054***	10.4717***	1,167
Cultural Control			.7094***	39.5486***	1,167
Effect Certainty	.2381	17.3992***	1.3891	10.4717***	1,167
Cultural Control			.8795**	39.5486***	1,167
EFF x CC			-.0111	.2073	1,167

* p < .10; ** p < .05; ***p < .01

TABLE 60

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF STATE CERTAINTY AND MCS TO ORGANIZATIONAL COMMITMENT

Relationship of State Certainty and Bureaucratic Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
State Certainty	.0533	9.6316***	-.9964***	9.6316***	1,171
State Certainty	.1012	9.5698***	-.8901***	10.7552***	1,170
Bureaucratic Control			.4560***	7.9475***	1,170
State Certainty	.1028	6.4571***	-.0701	.0022	1,169
Bureaucratic Control			.7418	10.7552***	1,169
STATE x BC			-.0236	8.2709***	1,169

* p < .10; ** p < .05; ***p < .01

Relationship of State Certainty and Cultural Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
State Certainty	.0507	9.0242***	-.9720***	9.0242***	1,169
State Certainty	.2187	23.5117***	-.7596**	6.5611**	1,168
Cultural Control			.7612***	39.17433** *	1,168
State Certainty	.2221	15.8956***	.5512	.1256	1,167
Cultural Control			1.0048***	39.1733***	1,167
STATE x CC			-.0248	7.1998***	1,167

* p < .10; ** p < .05; ***p < .01

TABLE 61

MODERATED REGRESSION ANALYSIS
RELATIONSHIP OF RESPONSE CERTAINTY AND MCS TO ORGANIZATIONAL COMMITMENT

Relationship of Response Certainty and Bureaucratic Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Response Certainty	.0079	1.3816	-.3235	1.3816	1,174
Response Certainty	.0727	6.7809***	-.3867	2.0898	1,173
Bureaucratic Control			.5267***	11.4007***	1,173
Response Certainty	.0774	4.8107***	.7178	2.6245	1,172
Bureaucratic Control			1.0903*	11.4007***	1,172
RESP x BC			-.0329	.3533	1,172

* p < .10; ** p < .05; ***p < .01

Relationship of Response Certainty and Cultural Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Response Certainty	.0063	1.0880	-.2919	1.0880	1,171
Response Certainty	.1914	20.1256***	-.0952	.1391	1,170
Cultural Control			.7675***	40.3150***	1,170
Response Certainty	.1950	13.6477***	.8824	.5821	1,169
Cultural Control			1.0757***	40.3150***	1,169
RESP x CC			-.0187	.3085	1,169

* p < .10; ** p < .05; ***p < .01

TABLE 62

MCS/ANTECEDENT FIT AND ITS RELATIONSHIP TO ORGANIZATIONAL COMMITMENT

Independent Variable	Moderator Variable	Fit related to Organizational Commitment?	Comments
Technology	Bureaucratic Control	No	Bureaucratic control related to organizational commitment independent of technology
Technology	Cultural Control	No	Cultural control related to organizational commitment independent of technology
Department Size	Bureaucratic Control	No	Bureaucratic control positively related to organizational control independently of department size
Department Size	Cultural Control	No	Cultural control related to organizational commitment independently of department size
Structure	Bureaucratic Control	No	Bureaucratic control related to organizational commitment independently of structure
Structure	Cultural Control	No	Cultural control related to organizational commitment independently of structure
Dynamism	Bureaucratic Control	No	Dynamism negatively related to organizational commitment; bureaucratic control positively related but independently
Dynamism	Cultural Control	No	Cultural control positively related to organizational commitment independently of dynamism
Effect Certainty	Bureaucratic Control	No	Effect certainty and bureaucratic control positively and independently related to organizational commitment
Effect Certainty	Cultural Control	No	Effect certainty and cultural control positively and independently related to organizational commitment
State Certainty	Bureaucratic Control	No	State certainty negatively and bureaucratic control positively and independently related to organizational commitment
State Certainty	Cultural Control	No	State certainty negatively and cultural control positively and independently related to organizational commitment
Response Certainty	Bureaucratic Control	No	Bureaucratic control related to organizational commitment independently of response certainty
Response Certainty	Cultural Control	No	Cultural control related to organizational commitment independently of response certainty

TABLE 63

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF TASK COMPLEXITY AND SCM TO ORGANIZATIONAL COMMITMENT

Relationship of Task Complexity and Output Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Task Complexity	.0264	4.6691**	-.4997**	4.6691**	1,172
Task Complexity	.0453	4.0616**	-.5473**	4.6671**	1,171
Output Control			1.4269*	3.3891*	1,171
Task Complexity	.0472	2.8043**	-.9226	4.6671**	1,170
Output Control			-.1705	.0034	1,170
TASK x OC			.0880	3.7160*	1,170

* p < .10; ** p < .05; ***p < .01

Relationship of Task Complexity and Behavioral Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Task Complexity	.0264	4.6991**	-.4998**	4.6991**	1,172
Task Complexity	.1166	11.2856***	-.4591**	4.3077**	1,171
Behavior Control			3.8537***	17.9189***	1,171
Task Complexity	.1193	7.6796***	.4201	.1171	1,170
Behavior Control			6.6595*	17.9189***	1,170
TASK x BEH			-.1557	4.7331**	1,170

* p < .10; ** p < .05; ***p < .01

TABLE 64

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF INPUT UNCERTAINTY AND SCM TO ORGANIZATIONAL COMMITMENT

Relationship of Input Uncertainty and Output Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Input Uncertainty	.0010	.1641	.0672	.1641	1,168
Input Uncertainty	.0132	1.1165	.0409	.0602	1,167
Output Control			1.1401	2.1851	1,167
Input Uncertainty	.0156	.8795	.3486	.0602	1,166
Output Control			3.5910	2.1851	1,166
INP x OC			-.0734	.4133	1,166

* p < .10; ** p < .05; ***p < .01

Relationship of Task Complexity and Behavioral Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Input Uncertainty	.0010	.1641	.0673	.1641	1,168
Input Uncertainty	.0881	8.0715***	.0019	.0001	1,167
Behavior Control			3.8061***	16.2394***	1,167
Input Uncertainty	.0893	5.4235***	.2979	.1954	1,166
Behavior Control			5.6700	16.2394***	1,166
INP x BEH			-.0546	.0093	1,166

* p < .10; ** p < .05; ***p < .01

TABLE 65

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF GOAL CONGRUENCE (1) AND SCM TO ORGANIZATIONAL COMMITMENT

Relationship of Goal Congruence (Actual/Perceived) and Ritual Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Goal Congruence (1)	.0362	6.6031**	-3.0001**	6.6031**	1,176
Goal Congruence (1)	.0727	6.8579***	-2.4492**	4.4011**	1,175
Ritual Control			2.3574***	9.1380***	1,175
Goal Congruence (1)	.07333	4.5899***	-.2897	4.4109**	1,174
Ritual Control			2.3952***	9.1380***	1,174
GC1 x RC			-1.2330	.1133	1,174

* p < .10; ** p < .05; ***p < .01

Relationship of Goal Congruence (actual/perceived) and Professional Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Goal Congruence (1)	.0362	6.6031**	-3.0001**	6.6031**	1,176
Goal Congruence (1)	.0384	3.4944**	-2.8335**	6.6031**	1,175
Professional Control			.5612	.4078	1,175
Goal Congruence (1)	.0464	2.8218**	-.2913	.0145	1,174
Professional Control			.6114	.5239	1,174
CG1 x PC			-.8352	7.9965***	1,174

* p < .10; ** p < .05; ***p < .01

TABLE 66

MODERATED REGRESSION ANALYSIS
RELATIONSHIP OF GOAL CONGRUENCE (2) AND SCM TO ORGANIZATIONAL COMMITMENT

Relationship of Goal Congruence (Actual/Actual) and Ritual Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Goal Congruence (2)	.0499	8.0922***	-3.4518***	8.0922***	1,154
Goal Congruence (2)	.0903	7.5911***	-3.2154***	8.0922***	1,153
Ritual Control			2.5105**	6.7860**	1,153
Goal Congruence (2)	.1589	9.5699***	2.7932***	8.0922***	1,152
Ritual Control			2.2943**	6.0629**	1,152
GC2 x RC			-16.9583***	13.1887***	1,152

* p < .10; ** p < .05; ***p < .01

Relationship of Goal Congruence (actual/actual) and Professional Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Goal Congruence (2)	.0499	8.0922***	-3.4518***	8.0922***	1,154
Goal Congruence (2)	.0568	4.6078**	-3.3136***	8.0922***	1,153
Professional Control			.9468	1.1173	1,153
Goal Congruence (2)	.1248	7.2244***	-12.9406***	8.0922***	1,152
Professional Control			.6377	.5368	1,152
CG2 x PC			2.1626***	12.6041***	1,152

* p < .10; ** p < .05; ***p < .01

TABLE 67

MODERATED REGRESSION ANALYSIS RELATIONSHIP OF GOAL CONGRUENCE (3) AND SCM TO ORGANIZATIONAL COMMITMENT

Relationship of Goal Congruence (Perceived/Perceived) and Ritual Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Goal Congruence (3)	.0211	3.3148*	-2.2486*	3.3148*	1,154
Goal Congruence (3)	.0661	5.4188***	-2.1336*	3.1041*	1,153
Ritual Control			2.6475***	7.6294***	1,153
Goal Congruence (3)	.1097	6.2454***	-13.2516***	3.1041*	1,152
Ritual Control			2.1957**	7.6294***	1,152
GC3 x RC			2.3155***	7.4421***	1,152

* p < .10; ** p < .05; ***p < .01

Relationship of Goal Congruence (Perceived/Perceived) and Professional Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Goal Congruence (3)	.0211	3.3148*	-2.2486*	3.3148*	1,154
Goal Congruence (3)	.0302	2.3806*	-2.1331*	3.3148*	1,153
Professional Control			1.0859	1.4370	1,153
Goal Congruence (3)	.0549	2.9449**	-8.0276**	3.3148*	1,152
Professional Control			.5572	.3548	1,152
CG3 x PC			1.3705**	5.1126**	1,152

* p < .10; ** p < .05; ***p < .01

TABLE 68

SCM/ANTECEDENT FIT AND ITS RELATIONSHIP TO ORGANIZATIONAL COMMITMENT

Independent Variable	Moderator Variable	Fit related to Organizational Commitment?	Comments
Task Complexity	Output Control	No	Task complexity negatively related to organizational commitment independently of output control
Task Complexity	Behavior Control	No	Task complexity negatively related to organizational commitment; behavior control positively related
Input Uncertainty	Output Control	No	
Input Uncertainty	Behavior Control	No	Behavior control positively related to organizational commitment independently of input uncertainty
Goal Congruence (actual/perceived)	Ritual Control	No	Goal congruence and ritual control positively and independently related to organizational commitment
Goal Congruence (actual/perceived)	Professional Control	No	Goal congruence positively related to organizational commitment independently of professional control
Goal Congruence (actual/actual)	Ritual Control	Yes	The positive impact of goal congruence on organizational commitment is higher when ritual control is high than when it is low
Goal Congruence (actual/actual)	Professional Control	Yes	The positive influence of goal congruence on organizational commitment is higher when professional control is high than when it is low
Goal Congruence (perceived/perceived)	Ritual Control	Yes	The positive impact of goal congruence on organizational commitment is higher when ritual control is high than when it is low
Goal Congruence (perceived/perceived)	Professional Control	Yes	The positive influence of goal congruence on organizational commitment is higher when professional control is high than when it is low

behavior or ritual control were related to organizational commitment. Task complexity, however, was negatively related to organizational commitment independent of the SCM. In addition, behavior control was positively related to organizational commitment independently of task complexity or input uncertainty.

A different pattern emerged in testing the fits of goal congruence and ritual or professional control and their relationships with organizational commitment. Actual/perceived goal congruence was positively related to organizational commitment independently of ritual or professional control. The fits with ritual or professional control of both actual/actual and perceived/perceived goal congruence, however, were significantly related to organizational commitment. The positive influence of goal congruence on organizational commitment was higher when ritual or professional controls were high than when they were low.

The first portion of the hypothesis, therefore, was partially supported, but only for the antecedents of ritual and professional control. Several variables were related to organizational commitment, but generally independently of fit.

The second part of hypothesis 11 offered a contrasting proposition—that organizational commitment is higher when cultural controls are used than when bureaucratic controls are used. A moderated regression model with cultural control and bureaucratic control as independent variables and organizational commitment as the dependent variable yielded significant results ($R^2 = .2256$, $p < .0001$). Both cultural control and bureaucratic control were significantly related to organizational commitment, as was the interaction of bureaucratic and cultural control (see Table 69). Cultural control has a stronger relationship than bureaucratic control with organizational commitment. The significant weight of the interaction term implies that the positive impact of bureaucratic control on organizational commitment is higher when cultural control is high than when it is low. The stronger relationship of cultural

TABLE 69

MODERATED REGRESSION ANALYSIS
RELATIONSHIP OF BUREAUCRATIC AND CULTURAL CONTROL TO ORGANIZATIONAL COMMITMENT

Relationship of Bureaucratic and Cultural Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Bureaucratic Control	.0646	12.0200***	.5237***	12.0200***	1,174
Bureaucratic Control	.2045	22.2358***	.3220**	4.9695**	1,173
Cultural Control			.6738***	38.6211***	1,173
Bureaucratic Control	.2256	16.7061***	-1.1634*	9.1375***	1,172
Cultural Control			-.2627	.3428	1,172
BC x CC			.0291**	39.037***	1,172

* p < .10; ** p < .05; ***p < .01

control than bureaucratic control with organizational commitment, however, provides support for this portion of the hypothesis.

Part three of the hypothesis proposed that organizational commitment would be higher when ritual controls were used than when professional controls were used. This hypothesis was measured at the individual level. A moderated regression model with organizational commitment as the dependent variable and ritual control and professional control as the independent variables yielded a significant but relatively small R-squared ($R^2 = .0535$, $p < .05$, see Table 70). Ritual control was positively related to organizational commitment; professional control was not. The interaction was not significant, implying that the relationship of ritual control and organizational commitment is independent of professional control. This indicates that ritual control contributes positively to organizational commitment, while professional control does not. These results provide support for the hypothesis that organizational commitment is higher when ritual controls are used than when professional controls are used.

Hypothesis Twelve

The first part of this hypothesis stated that the configuration of lower perceived environmental uncertainty, routine technology, large organizational unit size, and a mechanistic structure would be associated with a bureaucratic control system. A multiple linear regression model was used to test this hypothesis, with level of bureaucratic control as the dependent variable and department size, technology, structure, dynamism, state certainty, effect certainty, and response certainty as the independent variables. Department size, technology, and effect certainty were predicted to have positive betas; the other variables were predicted to have negative betas. At the department level, using a forward stepwise regression model, the results were significant ($R^2 = .2648$, $p = .0023$, see Table 71). Four variables entered the

TABLE 70

MODERATED REGRESSION ANALYSIS
RELATIONSHIP OF RITUAL AND PROFESSIONAL CONTROL TO ORGANIZATIONAL COMMITMENT

Relationship of Ritual and Professional Control to Organizational Commitment (Individual level)

Variables included	Cumulative R-squared	F-ratio for Regression	Unstandardized regression coefficients	F-ratio for individual variables	df
Professional Control	.0077	1.3616	1.0138	1.3616	1,176
Professional Control	.0534	4.9393***	-.9412	.7533	1,175
Ritual Control			3.3078***	9.1380***	1,175
Professional Control	.0535	3.2755**	-1.1212	.7533	1,174
Ritual Control			3.1682	9.1380***	1,174
PC x RC			.0395	.0041	1,174

* p < .10; ** p < .05; ***p < .01

TABLE 71
MULTIPLE REGRESSION MODEL
ANTECEDENTS OF BUREAUCRATIC CONTROL

Forward Stepwise Model: Antecedents of Bureaucratic Control (Department level)

Variable	*B*	SE(*B*)	β	T	p (T)
Technology	.1774	.1055	.2096	1.68	.0985
Effect Certainty	.7651	.2721	.3471	2.81	.0069
State Certainty	-.7048	.3203	-.2817	-2.20	.0322
Department Size	.1884	.1133	.1977	1.66	.1022

$F(4,53) = 4.77$, $p = .0023$, $R^2 = .2648$

model, all with beta coefficients in the predicted direction: technology, department size, effect certainty, and state certainty. When included, the hospital variable did not enter the stepwise model. At the department level, therefore, bureaucratic control was associated with more routine technology, larger department size, and higher perceived environmental uncertainty. Bureaucratic control was not associated with a mechanistic structure.

At the individual level, the results were also significant ($R^2 = .2286$, $p < .0001$, see Table 72). Department size, technology, and effect certainty were significant and had positive beta coefficients. As expected, state certainty and structure had negative beta coefficients (although non-significant). When entered into the model, the hospital variable was not significant and did not change the pattern of the results. These results provide strong support for the hypothesis that the configuration of lower perceived environmental uncertainty, routine technology, large organizational unit size, and a mechanistic structure is associated with a bureaucratic control system.

The second part of the hypothesis predicted that the configuration of higher perceived environmental uncertainty, non-routine technology, small organizational unit size, and an organic structure would be associated with a cultural control system. This required that department size, technology, and effect certainty have negative beta coefficients and the other independent variables have positive beta coefficients. At the department level, using a forward stepwise model, the model was significant ($R^2 = .2493$, $p = .0004$, see Table 72). Two variables entered the model: structure ($ß = .4163$, $p = .0008$, predicted direction) and dynamism ($ß = -.2275$, $p = .0586$, opposite direction). When added to the independent variables, the hospital variable did not enter the stepwise model. At the individual level, the model was also significant ($R^2 = .2150$, $p < .0001$, see Table 73). Three variables entered the model: structure ($ß = .2427$, $p = .0013$, predicted direction), dynamism ($ß = -.2581$,

TABLE 72
MULTIPLE REGRESSION MODEL
ANTECEDENTS OF BUREAUCRATIC CONTROL

Antecedents of Bureaucratic Control (Individual level)

Variable	*B*	SE(*B*)	β	T	p (T)
Department Size	.2637	.0749	.2529	3.52	.0006
Technology	.1769	.0511	.2610	3.46	.0007
Structure	-.0647	.0580	-.0818	-1.12	.2658
Environmental Dynamism	.0062	.0666	.0070	.09	.9258
State Certainty	-.2883	.1522	-.1383	-1.89	.0601
Effect Certainty	.4015	.1272	.2330	3.16	.0019
Response Certainty	.1284	.1291	.0732	.99	.3216

$F(7,154) = 6.52$, $p < .0001$, $R^2 = .2286$

Antecedents of Bureaucratic Control (Individual level)

Variable	*B*	SE(*B*)	β	T	p (T)
Department Size	.2228	.0738	.2193	3.02	.0030
Technology	.1574	.0512	.2360	3.03	.0029
Structure	-.0823	.0554	-.1101	-1.48	.1397
Environmental Dynamism	.0576	.0662	.0657	.87	.3858
State Certainty	-.2128	.1509	-.1038	-1.41	.1607
Effect Certainty	.3902	.1305	.2285	2.99	.0033
Response Certainty	.1386	.1281	.0808	1.08	.2813
Hospital	-2.1244	1.1091	-.1433	-1.92	.0574

$F(8,153) = 6.06$, $p < .0001$, $R^2 = .2457$

TABLE 73
FORWARD STEPWISE REGRESSION MODEL
ANTECEDENTS OF CULTURAL CONTROL

Forward Stepwise Model: Antecedents of Cultural Control (Department Level)

Variable	*B*	SE(*B*)	β	T	p (T)
Structure	.4350	.1231	.4163	3.54	.0008
Environmental Dynamism	-.2807	.1454	-.2275	-1.93	.0586

$F(2,55) = 9.13$, $p = .0004$, $R^2 = .2493$

Forward Stepwise Model: Antecedents of Cultural Control (Individual Level)

Variable	*B*	SE(*B*)	β	T	p (T)
Environmental Dynamism	-.2714	.0789	-.2602	-3.47	.0007
Structure	.2310	.0683	.2471	3.39	.0009
Effect Certainty	.4344	.1476	.2136	2.94	.0038
State Certainty	-.2898	.1798	-.1178	-1.61	.1091
Department Size	-.1305	.0889	-.1061	-1.47	.1441
Technology	.0750	.0605	.0937	1.24	.2171

$F(6,155) = 7.03$, $p < .0001$, $R^2 = .2139$

p = .0008, opposite direction), and effect certainty (ß = .2063, p = .0063, opposite direction). The hospital variable did not enter the stepwise model. The results indicate that an organic structure is associated with cultural control, as is lower perceived environmental uncertainty. The effects of department size were in the predicted direction, but were not significant.

Summary

In this chapter, the results obtained from the data collection and by testing the study hypotheses were presented. The next chapter will discuss the findings, delineate limitations of the study, provide suggestions for future research, examine implications for researchers and practitioners, and summarize conclusions of the study.

CHAPTER V

DISCUSSION AND CONCLUSIONS

The first section of this chapter provides a summary of the findings of this study, followed by a discussion of the findings in relation to the comprehensive control model tested in this study. Limitations of the study are then presented, including limitations that may affect the validity of the findings and limitations that may affect the generalizability of the findings. Suggestions for future research are provided, along with implications for researchers and practitioners. Finally, the conclusions section reviews the purposes of the study and the extent to which these purposes have been reached.

Summary of the Findings

Twelve hypotheses were developed for empirical testing in this study. Several of these hypotheses contained multiple parts; in all there were a total of twenty-seven testable items. Nine of these items were supported, nine were partially supported, and nine were not supported. Table 74 presents a summary of the findings. In general, hypotheses concerning the contextual and structural antecedents of bureaucratic and cultural control were supported. Hypotheses concerning the antecedents of output and behavior controls received little support, while those concerning the antecedents of ritual and professional controls received stronger support. The fit of the model was found to be strongly related to job satisfaction and partially related to organizational commitment and department performance. Cultural control and ritual control were also found to have a strong relationship with job satisfaction and organizational commitment.

TABLE 74

SUMMARY OF FINDINGS

H #	Hypothesis	Sup-ported	Partially Supported	Not Sup-ported	Comments
1	Routine Technology ⇨ Bureaucratic Control	X			Supported at individual level; department level is hospital-specific
	Nonroutine Technology ⇨ Cultural Control			X	
2	Large Department Size ⇨ Bureaucratic Control	X			
	Small Department Size ⇨ Cultural Control		X		Supported by regression results; not supported by correlations
3A	Low PEU ⇨ Bureaucratic Control	X			High state and effect certainty related to bureaucratic control
3B	High Munificence + High PEU ⇨ Cultural Control		X		Munificence associated with cultural control, PEU not
3C	Scarcity ⇨ Bureaucratic Control		X		Low PEU associated with bureaucratic control; munificence does not moderate the relationship
4A	Mechanistic Structure ⇨ Bureaucratic Control	X			Regression supports; correlations support at individual level
4B	Organic Structure ⇨ Cultural Control	X			Regression supports; correlations support at both individual and department level
5A	High Task Complexity + Measurable Outputs ⇨ Output Controls			X	Behavior controls more prevalent than output controls
5B	Low Task Complexity + Unmeasurable Outputs ⇨ Behavior Control			X	Behavior controls more prevalent than output controls
5C	Low Task Complexity + Measurable Outputs ⇨ No Preference	X			Behavior control higher than output control, but not significantly
6A	Low Task Complexity + High Input Uncertainty ⇨ Output Control			X	Output control used least when task complexity is moderate
6B	Low Task Complexity + Low Input Uncertainty ⇨ Behavior Control			X	Behavior controls more prevalent than output controls

TABLE 74 (continued)

SUMMARY OF FINDINGS

Hyp #	Hypothesis	Sup-ported	Partially Sup-ported	Not Sup-ported	Comments
7	Unmeasurable Outputs or High measurement costs ⇨ Behavior Control			X	Behavior controls more prevalent than output controls
8A	Availability of Professionals + Congruent Socialization ⇨ Professional Control	X			Goal congruence, compensation, and professional training related to professional control
8B	Low Availability or Incongruent Socialization ⇨ Ritual Control			X	Professional values related to ritual control
9	Antecedent/MCS fit ⇨ Job Satisfaction		X		Size, PEU, structure fit with MCS related to job satisfaction
	Antecedent/SCM fit ⇨ Job Satisfaction		X		Goal congruence important antecedent
10	Antecedent/MCS fit ⇨ Department Performance		X		The fits of technology and structure with bureaucratic control related to perceived department performance
	Antecedent/SCM fit ⇨ Department Performance			X	No fits significant. Ritual control negatively associated with performance.
11	Antecedent/MCS fit ⇨ Organizational Commitment			X	Fits not significant, but size and PEU variables are
	Antecedent/SCM fit ⇨ Organizational Commitment		X		Fit of goal congruence with ritual and professional control related to org. commitment
11B	Org. Commitment higher under cultural control than bureaucratic control	X			Org. commitment higher under cultural, but highest when both are high
11C	Org. Commitment higher under ritual control than professional control	X			
12A	Low PEU + Routine Technology + Large Dept. Size + Mechanistic Structure ⇨ Bureaucratic Control		X		Supported for PEU, technology, and size, but not for structure
12B	High PEU + Nonroutine Technology + Small Dept. Size + Organic Structure ⇨ Cultural Control		X		Structure and low PEU related to cultural control

Discussion

The results provided substantial support for some portions of the comprehensive control model on which this study is based (see Figure 8), and little support for others. This section of the paper discusses the meaning of the pattern of results and the contributions of this study toward the understanding of control systems and methods in organizations. The important patterns relating to control system antecedents are discussed first, followed by the patterns relating to outcomes. Contributions of this study to the understanding of context factors and structure are then discussed.

Control System Antecedents

Three major patterns related to the antecedents of management control systems and supervisory control methods emerge from an analysis of the results; each will be discussed individually in the following sections. First, the antecedents of management control systems received strong support, while the antecedents of supervisory control methods did not. Second, the pattern of antecedents of bureaucratic control differs substantially from that of cultural control; of the management control system antecedents tested, only two—size and structure—exhibited the expected relationships with both bureaucratic and cultural control. The other MCS antecedents tested exhibited different patterns of relationships with bureaucratic and cultural control. Third, no support was found for the hypothesized antecedents of output and behavior control, and, while some support was found for the hypothesized antecedents of ritual and professional control, none of the antecedents effectively discriminates between these control methods. Figure 9 shows the resulting control model, based on the supported relationships. Performance, job satisfaction, and organizational

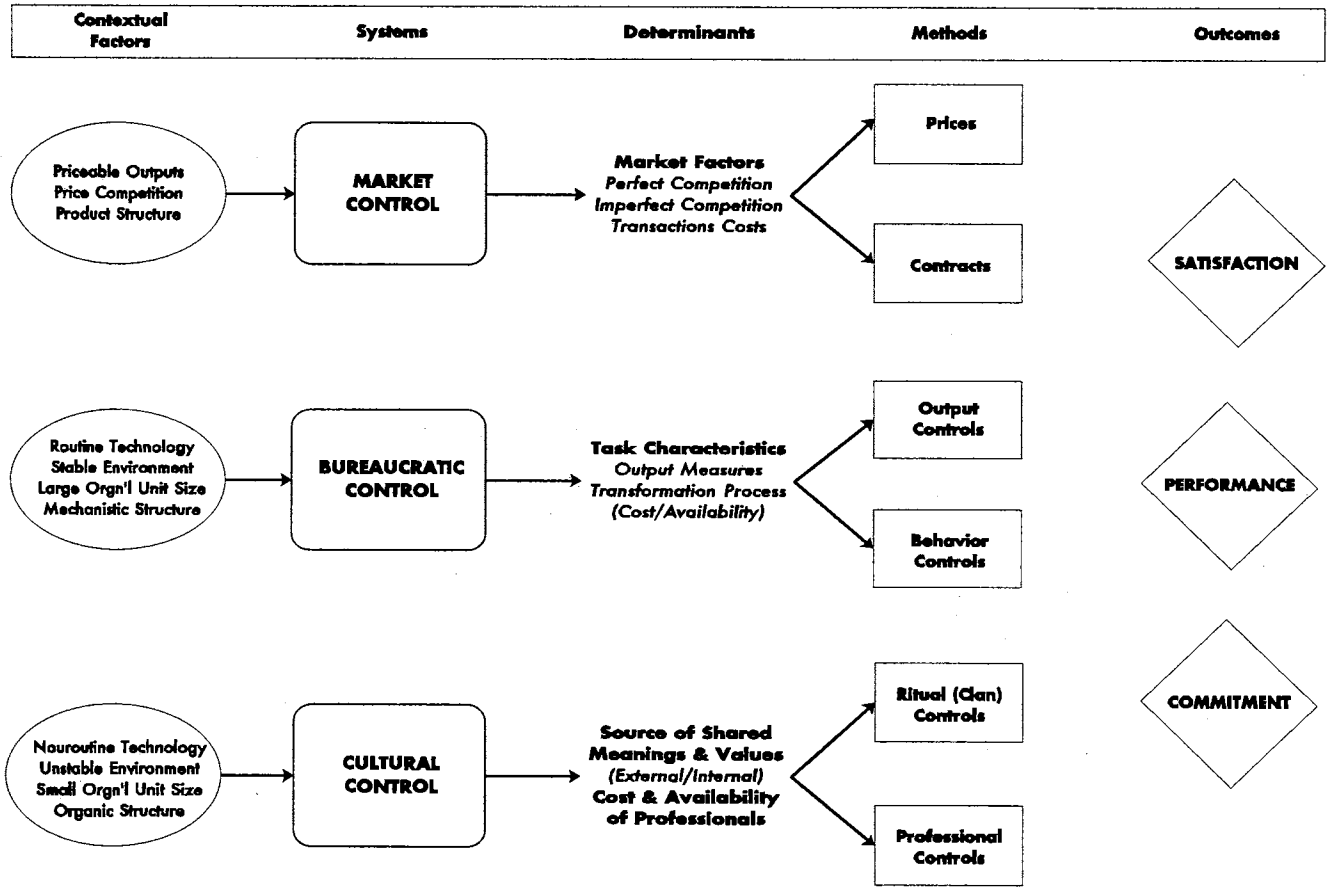


Figure 8. Comprehensive Management Control Model

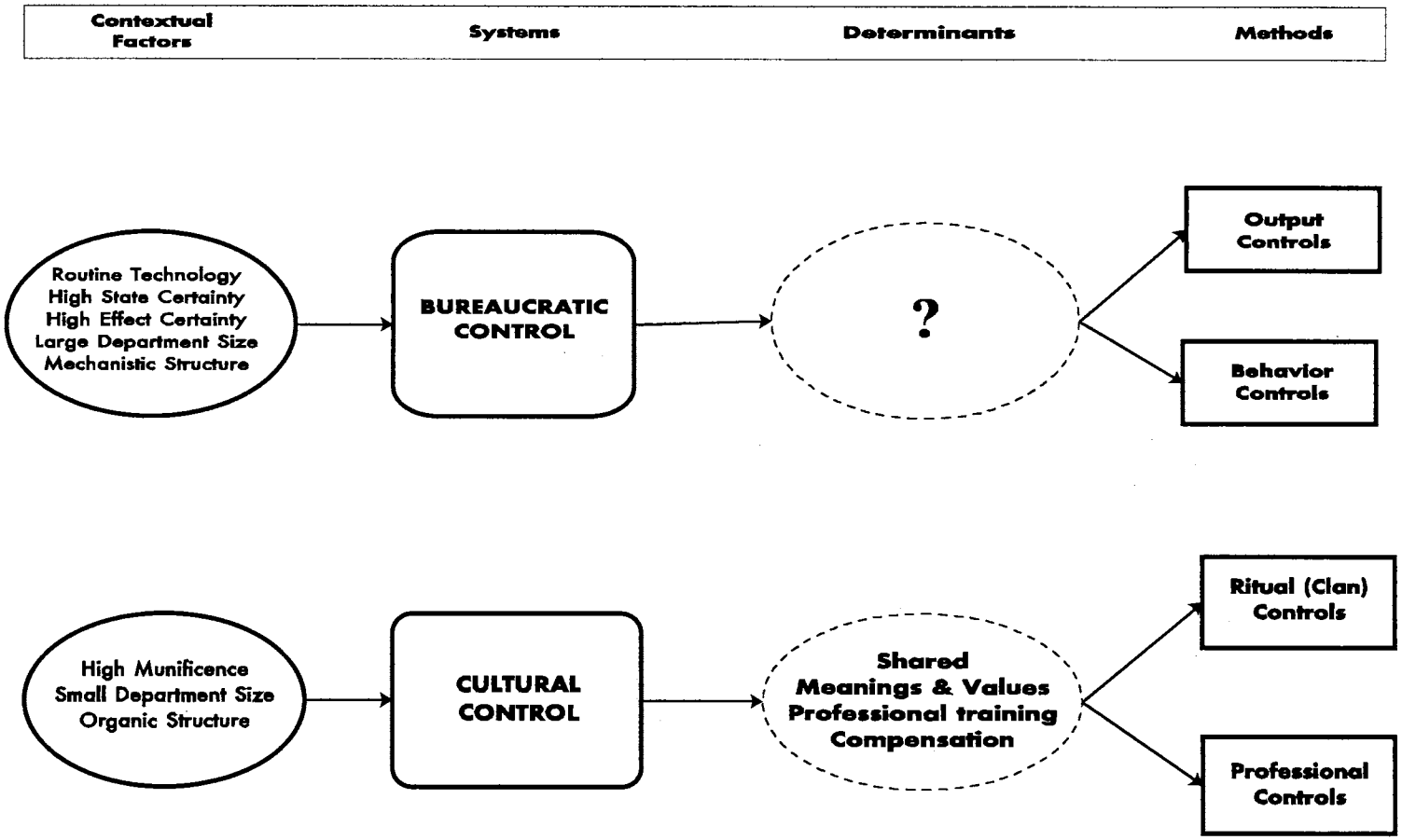


Figure 9. Revised Management Control Model

commitment have not been included in the model as they will be discussed in a later section.

MCS versus SCM Antecedents

The stronger support received for the hypothesized antecedents of management control systems than for antecedents of supervisory control methods was unexpected. After all, much of the previous empirical research on control focused on the antecedents of output and behavior controls (e.g. Ouchi & Maguire, 1975, Ouchi, 1977, Eisenhardt, 1985) rather than on the antecedents of management control systems. In contrast, the hypothesized MCS antecedents tested in this study were largely derived from conceptual articles or empirical research related to context or structure but not directly addressing the topic of management control (e.g. Daft, 1989; Hage & Aiken, 1969; Ovalle, 1984, Comstock & Scott, 1977; Trevino, 1986; Blau, 1972; Campbell & Akers, 1970). Perhaps the availability of reliable measures for MCS antecedents such as technology and structure, as compared with newly-developed or less reliable measures for SCM antecedents, contributed to this difference. Or perhaps supervisory control methods and their antecedents, which are somewhat of a mix of department-level and individual-level constructs, cannot effectively be studied using a questionnaire method of data collection.

It is more likely, however, that the key issue is the overwhelming preference for behavior control, as opposed to other supervisory control methods, in this sample. Similarly, bureaucratic control systems appear to be the default in this sample. These preferences and their implications are discussed below.

Antecedents of Bureaucratic and Cultural Control

Two antecedents—size and structure—were found to be antecedents of both bureaucratic and cultural control, as specified in the control model. Aside from these,

however, the pattern of management control system antecedents appears to differ greatly for bureaucratic and cultural control. Bureaucratic control appears to flourish under a combination of situational variables that implies little uncertainty in the work environment. The combination of routine technology, high state and effect certainty, and a mechanistic structure creates the impression of a rigid or highly specified work environment under which bureaucratic control can prosper.

On the other hand, cultural control appears to require a beneficent atmosphere in which to flourish. High resource munificence, an organic structure, and small department size appear to combine with congruent goals and values to create a positive work environment in which cultural control can prosper.

These patterns of antecedents of bureaucratic and cultural control seem to represent ideal situations in which each type of control is most feasible. In other words, these patterns of antecedents may represent opposite ends of a control continuum (see Figure 10). On the bureaucratic end of the control spectrum, the combination of mechanistic structure, routine technology, and low perceived environmental uncertainty results in a work situation where the outputs or behaviors required of workers can be specified with a high degree of precision. On the cultural end of the control spectrum, the combination of small department size, an organic structure, high goal congruence, and munificent resources results in a collegial work environment in which work norms are reinforced by worker interaction.

The stronger relationships of the antecedents to bureaucratic control than cultural control, along with the higher levels of bureaucratic control throughout the sample, seem to emphasize the default nature of bureaucratic control in this sample. Mak (1987) proposed that cultural forms of control exist only in near-ideal situations, while bureaucratic control exists in a wide variety of conditions, while Hecksher (1994) indicates that planned effort is necessary to overcome the tendencies toward

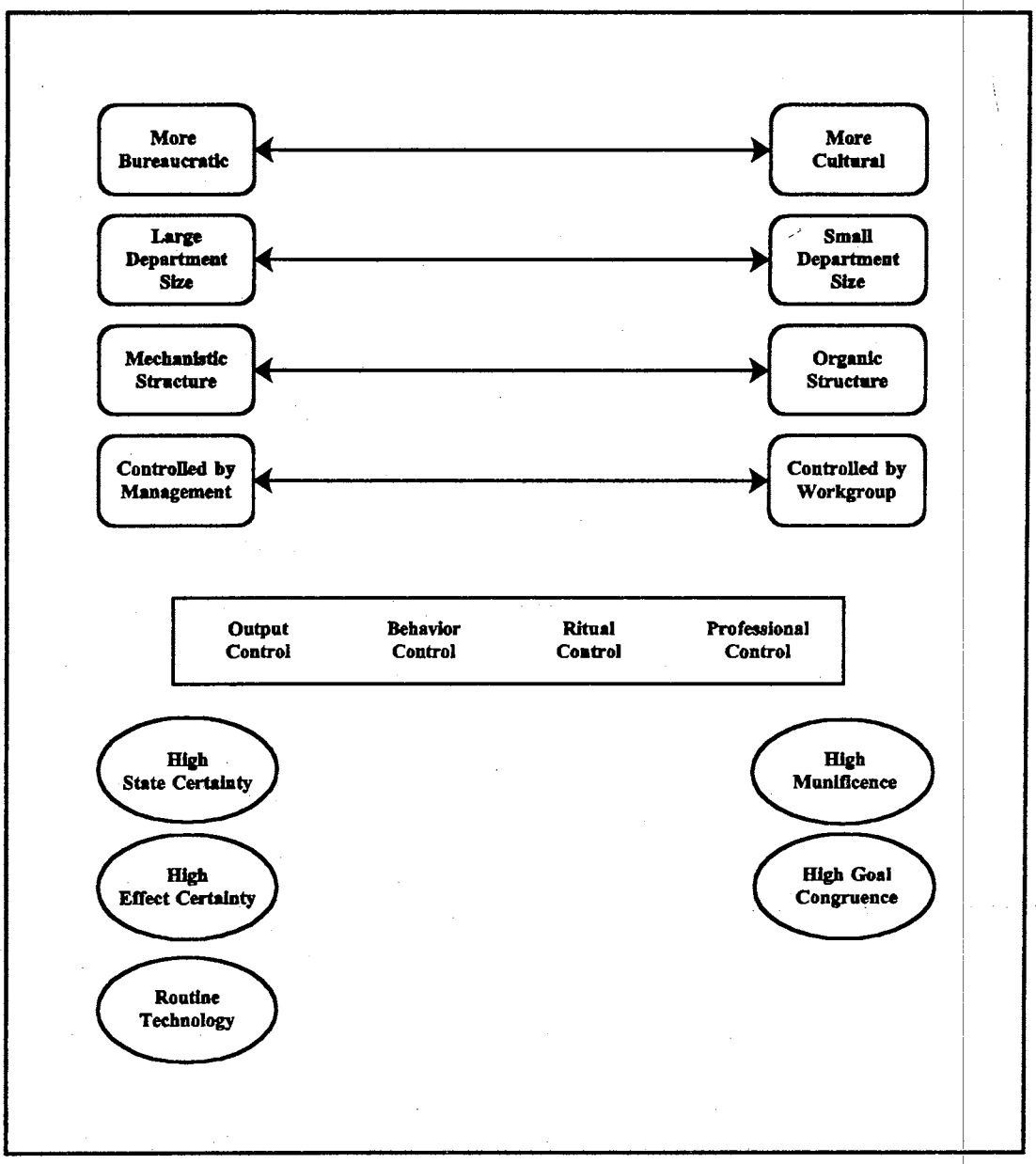


Figure 10. Control Antecedents (Revised Model)

bureaucracratic forms of control. Without strong forces towards cultural control, therefore, it appears that bureaucratic control will be prevalent. And, if cultural control does emerge in an organizational unit, it may be in conflict with the prevailing bureaucratic controls in the organization. It is then possible that the organizational unit will be pressured to adopt bureaucratic controls or be labeled as a renegade unit of the organization. It may be extremely difficult for department supervisors to swim against a bureaucratic tide encouraged by the hospital administration.

The tendency toward bureaucratic control as the default management control system appears to be augmented in this sample by the risk aversion of hospitals. Even though the context and structure may be consistent with cultural control, the organization cannot afford the control loss (and liability increase) that cultural control systems imply.

The relationship of perceived resource munificence and cultural control appears to be critical. Without the perception of slack resources, it appears that is is more difficult for cultural control to flourish. Resource slack seems to encourage the development of cultural control systems. The economic tendencies against resource munificence may also be a factor in the default nature of bureaucratic control systems, in that resource slack is a relatively rare occurrence in a competitive economy.

For cultural control to emerge in an organizational unit, therefore, it appears that several conditions may be helpful: (1) deliberate design, such as that of a company founder or founding department head, (2) being part of an organization in which cultural control systems are encouraged throughout the organization, (3) the existence of slack resources (or at least the perception of slack resources), (4) cultural control traditions in an industry or profession to which the organizational unit belongs, or (5) a department that chooses to be a deviant subculture within an otherwise bureaucratically-controlled organization. It appears that without strong forces

encouraging cultural control systems, bureaucratic control systems will predominate (Hecksher, 1994).

Context Factors and Management Control

This research also makes several contributions to the understanding of the relationships of size, technology, perceived environmental uncertainty, and structure to management control. These relationships are discussed in the following sections.

Department Size. This study provided a direct test of the previously-untested relationship of department size and bureaucratic and cultural control. The finding that small department size is an antecedent of cultural control supports Wilkins and Ouchi's (1983) proposition that small departments should find it easier to develop the shared meanings and values consistent with cultural control. It also support's Daft's (1989) contention that small size would be associated with clan control, while large size would be associated with bureaucratic control.

Left untested by this study is the relationship of organizational size and management control and the interaction of organizational size and department size with management control. It is possible, for example, that the effects of organizational size on management control systems may overwhelm those of department size in larger organizations. If bureaucratic control is the default management control system, as discussed earlier, it is possible that cultural control would flourish under the combination of small organizational size plus small department size, while bureaucratic control would be likely in the small/large, large/small, and large/large conditions.

In some organizations, subunit size has been negatively related to performance and productivity (Carillo & Kopelman, 1991; Gooding & Wagner, 1985), possibly due to free-riding tendencies in large departments (Jones, 1984; Fleishman, 1980) or higher coordination costs (Steiner, 1972). No such relationships were found in this study. It is possible that the perceptual measure of department performance used in this study

contributed to the lack of relationship between department size and performance and that free-riding tendencies might have been discerned if actual performance measures had been available.

Technology. Few studies have directly examined the relationships of technology and management control; this study provided a direct test of the relationship between technological routineness and management control. It demonstrated support for Daft's (1989) proposition that routine technology should be associated with bureaucratic control, but did not support the proposition that nonroutine technology would be associated with cultural control. Given the default nature of bureaucratic control, it appears that while nonroutine technology should be associated with cultural control, other factors such as high goal congruence and resource slack may contribute more substantially to the development of cultural control. And, while routine technology may clearly call for bureaucratic control, nonroutine technology may also be associated with bureaucratic control if resources are tight or a lack of goal congruence exists.

Structure. Barley and Kunda (1992) proposed that mechanistic and organic structures would be associated with rational (bureaucratic) and normative (cultural) controls, respectively. This study provided a direct test of that proposition and supported it. Not only was structure supported as an antecedent of management control systems, its fit with bureaucratic control was related to performance and its fit with both bureaucratic and cultural control was related to job satisfaction. Structure was, therefore, the only proposed management control system antecedent whose fit with management control was related to more than one of the outcome variables. This appears to indicate that structure plays a key role in influencing management control choices at the department level. Bureaucratic control is consistent with the functional specialization and vertical communication pattern of mechanistic structures, while cultural control is consistent with the less specialized and more adaptable

characteristics of organic structures. It appears that structure and management control are closely related in terms of fit at the department level. While it is critical to avoid the trap of confusing structure and control (Ouchi & Maguire, 1975), it appears that the fit of structure and management control is important at the department level.

Perceived Environmental Uncertainty. The multi-faceted nature of the perceived environmental uncertainty construct dictated that several different types of perceived environmental uncertainty be measured in this study. The varying relationships of the perceived environmental uncertainty variables to management control tends to indicate the necessity of multiple perceived environmental uncertainty measures. In addition, the results imply that both the information-processing perspective and the environmental dependence perspective play a role in the relationship of perceived environmental uncertainty to management control, but in somewhat different domains. The information-processing perspective (Galbraith, 1973; Lawrence & Lorsch, 1967) appears to play a role in the relationship of perceived environmental uncertainty to bureaucratic control, in that high state and effect certainty were found to be antecedents of bureaucratic control, while munificence was not. Meanwhile, the environmental dependence perspective, which contends that resource munificence or scarcity serves as constraints on managerial decision-making (Pfeffer & Salancik, 1978; Hage & Aiken, 1967), appears to play a role in the relationship of perceived environmental uncertainty and cultural control. The finding that high resource munificence was related to cultural control, while the other perceived environmental uncertainty variables were not, provides support for this perspective. It is also possible that of the perceived environmental uncertainty variables studied, resource munificence is the most salient at the department level. Departments may be buffered from other forms of environmental uncertainty, but the perception of resource tightness or slack may be more difficult to buffer. Thus, given the default tendencies toward bureaucratic control, high perceived resource

munificence appears to be a critical factor in creating conditions under which cultural control can flourish.

Milliken (1987) proposed that three different constructs exist within the construct labeled as "perceived environmental uncertainty." Two of these constructs were found to be related to bureaucratic control: state certainty, which is uncertainty about the state of a particular component of the environment, and effect certainty, which relates to the ability or inability to predict the impact of environmental changes on the organization. It thus appears that an understanding of the state of the environment and the potential impact of environmental changes on the organization is necessary for bureaucratic control. Response certainty, which relates to the ability to predict the consequences of a particular response to the environment, was not related to bureaucratic control. It is likely that, when state and effect certainty are high, response certainty is irrelevant to management control system choice in that, if the state of a particular component of the environment is understood, and the ability to predict the impact of an environmental change on the organization is understood, the control system can be designed in such a way as to minimize the need to predict the consequences of a particular response to the environment. This study supports the proposition that bureaucratic controls are enhanced by the ability to specify detailed procedures and guidelines, which is possible only under conditions of a stable environment.

No perceived environmental uncertainty variables were related to perceived department performance, but several were related to job satisfaction and organizational commitment. Job satisfaction was negatively related to high perceived environmental uncertainty in the forms of dynamism, effect certainty, and response certainty. Organizational commitment was negatively related to high perceived environmental uncertainty in the forms of dynamism, state certainty, and effect certainty. It appears that an unstable work environment has negative effects on the

emotional well-being of workers, reducing both their work satisfaction and commitment to the organization. This finding is consistent with a recent study by Otley and Pierce (1995) in which high levels of perceived environmental uncertainty moderated and strengthened the relationship between leadership style and audit quality reduction behavior in a sample of public accounting firms, indicating that high levels of perceived environmental uncertainty may negatively affect job behaviors. The negative impact of perceived environmental uncertainty at the department level on job satisfaction and organizational commitment may indicate the inability to buffer certain departments from uncertainty. When this happens, the negative emotional consequences of environmental uncertainty may impact employees' job satisfaction and commitment to the organization.

Supervisory Control Method Antecedents

Few of the antecedents of supervisory control methods were supported by the results. This was largely due to the preference for behavior controls as opposed to output controls, ritual controls, or professional controls in this sample. The meaning of these findings is discussed in the following sections.

Output and Behavior Control. This study provided the opportunity to test competing theories concerning the antecedents of output and behavior control. Ouchi (1977) proposed that the ability to measure outputs and the nature of the transformation process were the key variables differentiating between output and behavior control. Trevino (1986) proposed that, especially in service organizations, task complexity and input uncertainty were the key antecedents; while Eisenhardt (1985) suggested that both the availability and cost of output measures were the key antecedents. None of these relationships were supported by the results. Measurement issues may have contributed to this lack of significant results; these will be examined in

a later section of this chapter. It is possible, however, that other factors may play a role in influencing bureaucratic supervisory control method choices.

As mentioned earlier, behavior controls were used more often than output, ritual, or professional controls in this sample. The preference for behavior control appears to be the key reason for the lack of support for hypotheses five, six, and seven. As was true for bureaucratic control, behavior control appears to be the default control method in this sample regardless of the hypothesized factors influencing the choice of supervisory control method.

There are a number of factors that may contribute to the preference for behavior control. In hospitals, there appears to be little financial incentive for a department to use output controls. Costs often either cannot be identified with a particular department, or are passed on to the patient or a third-party, such as an insurance company. For example, it would be reasonable to expect output controls to be used in the food service area of a hospital given the task characteristics involved. This ignores the fact, however, that the food service does not need to show a profit and passes its costs on to others. Thus, given the risks involved—such as providing a patient with a meal that is medically harmful—it is more prudent for supervisors to use behavior controls rather than output controls. Likewise, efficiency appears to be subordinate to other interests, such as risk management or quality of health care.

Another reason for the preference for behavior control may be the department level of analysis used in this study. Outputs are important to hospitals, but the outputs occur primarily at the organizational level rather than the department level. In other words, the primary output of a hospital is (hopefully) healthy patients; while many departments may contribute to the end result, the output of each relative to the output of the organization cannot be easily measured. Another output important to hospitals is mortality rates. A high mortality rate affects the reputation of the hospital and may harm its ability to draw patients. The contribution of individual departments to

mortality rates is largely impossible to measure, but the risk of high mortality rates is unacceptable. The end result appears to be the preponderance of behavior controls.

Ritual and Professional Control. The results clearly indicate the importance of shared meanings and values for any type of cultural control, whether workgroup-influenced (as in ritual control) or professionally-influenced (as in professional control). This is consistent with Ouchi's (1980) markets failure control framework, in which high goal congruence is a prerequisite for cultural (clan) control, and is also consistent with Tjosvold's (1986) contention that goal congruence, as developed through a history of positive subjective interdependence, is necessary for cultural controls to develop.

It was hypothesized that the source of shared meanings and values influences the choice between ritual and professional control; however, it appears that the existence of shared goals between supervisor and subordinate is more important than the source of the goals. This may indicate that managers will not provide an atmosphere conducive to cultural control, like that mentioned above, unless shared values exist. When such an atmosphere is allowed to exist, it may be that workers choose reference groups (co-workers or professional groups) based on natural patterns of work interaction and association.

Behavior and Ritual Control. These two supervisory control methods were highly intercorrelated in this study. Govindarajan and Fisher (1990) treated ritual control as a subset of behavior control, and Snell (1992) suggested that the construct definitions for these two types of control may be weak. The results of this study appear, on the surface, to support these contentions. Rather than weak construct definition, though, the issue may simply be that respondents have difficulty identifying the root differences between behavior and ritual control. While the former originates with management and the latter with the workgroup, both involve forces within the organization attempting to regulate behaviors. On a practical basis, the differences

may not be salient to the average employee. A recent study by Abernethy and Stoelwinder (1995) also found difficulties in distinguishing between behavioral controls and more cultural forms of control, thus suggesting that this phenomenon is not isolated to the current sample.

Outcomes

The hypotheses stated that the fit of the model would be related to higher levels of three important outcomes: performance, job satisfaction, and organizational commitment. The general lack of support for the hypothesized supervisory control method antecedents (due to the preference for behavior controls in this sample) made it impossible for the fits of the non-supported variables with the supervisory control methods to be significantly related to the outcome variables. On the other hand, the stronger support for the hypothesized antecedents of bureaucratic and cultural control made it possible for these fits to be related to the outcome variables. The results, though, appear to indicate a different set of relationships for each of the outcome variables. As a consequence, it does not appear to be possible to maximize these outcomes simultaneously through the choice of management control systems and methods. Each of the outcomes is discussed individually in the following sections.

Performance

Hospital executives perceived departmental performance to be higher when there was a combination of routine technology, a mechanistic structure, and bureaucratic control along with the perception by employees that their goals were congruent with those of their supervisor. Departmental performance was perceived to be lower when ritual or professional controls were in use and employees and their supervisor were actually in agreement in regard to goals. While measurement limitations may have affected these findings (as will be discussed later), an important

question remains: does this reflect actual performance differences, managerial bias, or both?

If the ratings of performance are indicative of actual performance, then the fit of bureaucratic control with routine technology and the fit of bureaucratic control with mechanistic structure must allow for increased efficiency and/or productivity and correspondingly higher levels of performance. Similarly, the munificent atmosphere required for ritual or professional control may be detrimental to performance or productivity. Perhaps the effort required to maintain the relationships and understandings necessary for cultural control reduces the productivity of the work group.

On the contrary, if perceived performance is not necessarily indicative of actual performance, then managers may assign higher performance ratings to departments in which the structure, technology, and management control system are more concrete and analyzable. In such departments, tangible indicators of performance are likely to exist, which may lead to higher assessments of performance. The fact that the availability of output measures and perceived department performance were highly correlated tends to suggest a managerial preference for departments with tangible output measures. In contrast, the fact that ritual control and department performance were negatively correlated suggests that managers may have a preference against departments utilizing ritual control methods. Such departments may appear "clannish" to top managers, and the ritual control methods may make it more difficult for them to assess department performance. In these departments, tangible performance indicators may not be available, resulting in correspondingly lower assessments of perceived performance. It is also possible that top management may perceive or assume suboptimization in departments with ritual control systems; in other words, managers may feel that the "clannish" culture of the department leads to a situation where the

department members work well together but the department's contribution to the organization as a whole is perceived to be less than optimal.

Job Satisfaction

To a much greater extent than was true for either department performance or organizational commitment, job satisfaction was related to the fit of the comprehensive management control model. This provides evidence that when the control system is matched with contextual and structural factors, job satisfaction is higher. This is consistent with the findings of Snavely (1987), who found higher levels of job satisfaction among nurses when bureaucratic control methods were used for routine tasks. It is also consistent with the findings of Abernethy and Stoelwinder (1995), who found that the fit between professionals and professional controls was positively related to job satisfaction, while job satisfaction was reduced when output forms of control were prevalent among professionals. When all elements of the control system exhibit internal fit, cognitive dissonance may be reduced, with accompanying increases in job satisfaction.

In addition, several variables were also related to job satisfaction independent of fit. The most significant of these is cultural control, which was more strongly related to job satisfaction than bureaucratic control was. This should not be interpreted to mean that cultural control is more important to job satisfaction than the fits mentioned above, but it may indicate that when it is not feasible to achieve these fits, cultural control may provide a good default choice in terms of enhancing job satisfaction. This provides some support for the contention that cultural controls are superior to bureaucratic controls and that organizations should focus on sending cultural control information throughout the organization rather than bureaucratic rules and regulations (Das, 1989).

Organizational Commitment

Organizational commitment was largely unaffected by the fit of control systems and methods and their antecedents, but was strongly related to cultural control, with ritual control more strongly related to organizational commitment than professional control. The pattern of antecedents clearly shows that organizational commitment is related to the culture of the organization and that situations in which shared goals and cultural control coexist enhance organizational commitment, consistent with the findings of Meglino *et al.* (1989) and Posner *et al.* (1985). That ritual control is more closely related to organizational commitment than is professional control may reflect the organizational socialization process that occurs under ritual control, in which commitment to the organization is encouraged or even required (Kunda, 1992). In professional control, the worker is more loosely connected with the organization and more committed to his or her profession (Welsch & LaVan, 1981).

This study indicates, however, that perceived environmental uncertainty (dynamism, effect certainty, and state certainty) may have detrimental effects on organizational commitment. Two of the three major factors of organizational commitment—the willingness to exert significant effort for the organization and the intention to continue membership in the organization (Mowday *et al.*, 1979)—may be negatively influenced by high levels of perceived environmental uncertainty. The negative impact of high perceived environmental uncertainty upon organizational commitment may be related to a lack of buffering of the operational core in some departments of the organization (Thompson, 1967). While health care organizations in general may experience high levels of environmental uncertainty, the inability of the organization to adequately buffer a department from that volatility may result in reduced commitment to the organization. Department members may eventually reduce their efforts on behalf of the organization or begin looking for work elsewhere.

Patterns of Outcome Antecedents

The different factors that contribute to high levels of the three outcomes variables in this study may indicate a dilemma of organizational control, in that it appears to be impossible to maximize outcomes simultaneously through the control system. Performance appears to be maximized by the fits of technology and structure with bureaucratic control and lessened by ritual and professional control. Job satisfaction is enhanced by the fit of the control model and by cultural control, and diminished by perceived environmental uncertainty. Organizational commitment is enhanced by goal congruence and cultural control, especially ritual control, and reduced by perceived environmental uncertainty. The contrast is especially significant for performance and organizational commitment, in that the factors that tend to increase performance tend to decrease organizational commitment, and the factors that tend to decrease performance tend to increase organizational commitment. Managerial implications of this dilemma will be examined in a later section of this chapter.

Limitations of the Study

Several limitations of this study are discussed in the following sections. The validity of the findings may be affected by issues of sample size, sample characteristics, and measurement limitations. The generalizability of the findings may be affected by the choice of a cross-sectional research design and a single-industry sample.

Limitations affecting Validity

Factors that limit the validity of the findings include sample size limitations, especially for sub-segments of the sample; sample characteristics limitations, and measurement limitations. These factors are addressed in the following sections.

Sample Size Limitations

Two levels of analysis were used in this study: individual and departmental. The sample size attained in the study was sufficient for testing non-categorized groups at these levels of analysis. The sample size, however, potentially limits the validity of the findings in two ways. First, the number of organizations studied was not sufficient to test organizational differences that might have an effect on the findings. It was not possible, for example, to test whether organization size moderates or interacts with department size as an antecedent of the management control system. It was also not possible to determine if organizational differences affect the relationship of resource munificence to control differences, or to determine organization-wide perceptions of environmental uncertainty. Because most other studies in which munificence was a variable have been measured at either the industry or the organizational level (e.g. Snell, 1992; Sharfman & Dean, 1991; Keats & Hitt, 1988; Dess & Beard, 1984), the small organizational sample size in this study makes comparisons with previous studies difficult. Because the focus of this study was at the department level of analysis, collecting data from enough organizations to allow for organization-level analysis was not practical.

Limitations due to Sample Characteristics

Three measures appeared to be affected by various characteristics of the sample, thus affecting the validity of those measures. The availability of professionals measure, which was designed to measure scarcity in the employment market for professionals, revealed no category of professionals in which serious labor shortages existed. Thus the hypothesis that departments would use ritual control instead of professional control when professionals were not available was not supported. It is possible that the use of a sample where shortages of professionals existed would result in different findings.

The professional training variable also may have been affected by sample-specific characteristics. A comparison of job titles and responses to the years of professional training question seems to indicate that many workers are not sure whether or not they should be classified as professionals. The hospital setting for this study may have influenced this pattern. Is a nurse a professional, or are only nurses with bachelor's degrees professionals? Or does it take a master's degree for a nurse to be considered a professional? The respondents appeared to be confused on this issue, which may have influenced the validity of the professional training variable. Rather than relying on self-report measures of professional status, it is possible that some form of job content analysis is necessary to classify professionals.

The availability of output measures variable also appeared to confuse some respondents. This also may have been at least partially due to the hospital setting for this study. It appears that respondents may not know whether output measures are kept of their performance, or whether medical documentation meant primarily for other purposes (such as patient charting) also serves as an output measure. This confusion may have affected the validity of this measure.

The most significant limitation of the sample, however, was in the inability to find the extent of cultural control expected. It seemed realistic to expect to find significant amounts of ritual and professional control in use in hospitals given the large percentage of employees with a professional education and orientation. Some tendency for risk management concerns to lead to bureaucratic control was expected, as mentioned in chapter two, but the strong tendencies toward bureaucratic control throughout the sample hospitals was not expected. A similar problem was noted by Davidson (1988), who studied the effectiveness of clan control in auditing firms, hypothesizing that the shared values of the auditing profession would result in the use of clan control. Davidson failed to find a high level of shared meanings and values among the employees of auditing firms, and thus failed to find the extent of clan

control hypothesized. It seems clear that merely having a large number of professionals working in an organization does not ensure the use of cultural control methods.

Measurement Limitations

The measures used for this study potentially limit the validity of the findings in several respects. First, the internal reliability of several measures was low (less than .70). Measures with low internal reliability included perceived munificence, task complexity, intensity of worker/client relationship, and cost of output measures. As a result, findings from hypotheses 3, 5, 6, and 7 must be viewed with caution.

Second, perceptual measures were used in this study for several constructs where actual measures would be helpful. If reliable actual measures of munificence, cost of output measures, and performance were available at a department level as well as an organization level, they might supplement and help establish the reliability and validity of the perceptual measures used in this study. While arguments have been made for the superiority of perceptual measures for some constructs (Dutton & Jackson, 1987; Smircich & Stubbart, 1985; Weick, 1979), such variables as cost of outcome measures or department performance appear to call for actual measures. For example, it has been argued that, at the department level, perceptions of munificence have a greater impact on decision-making than actual munificence (Castrogiavanni, 1991); real-life experience often demonstrates that individuals perceive scarcity regardless of the actual level of resource availability.

It is much more difficult, however, to argue for the superiority of a perceptual measure of performance. The problem is in creating a actual measure of department performance that is both reliable and valid across a wide spectrum of different types of departments. In this study, director-level executives, both line and staff, subjectively rated the performance of all hospital departments. While having all directors rate all

departments minimizes potential favoritism toward departments under a director's own purview, it may limit the accuracy of the ratings due to a lack of knowledge about departments in other areas of the organization. In this study, the interrater reliability was .60 in hospital one and .73 in hospital two. Line directors gave significantly different ratings than staff directors to only three departments; all were in hospital two. In each of these cases, the line directors gave higher performance ratings than the staff directors. According to an interview with a high-level administrative assistant at the hospital, these three departments (Outpatient Relations, Psychology, and Psychological Testing) were all "one big happy family." Reportedly, the administration had a continuing feud with these departments over the number of contact hours per therapist, with the departments feeling that a low number was fine, and the administration wanting a higher number for revenue generation purposes. The quality of patient care was excellent (according to the medical staff) but the revenue generation was not (according to the administration).

Another measurement issue that may affect the validity of the study is the method used to generate department-level responses, which were based on means of aggregated individual responses of department members. This method was required due to the need to compare supervisor and subordinate responses on variables such as goal congruence. The resulting loss of variance at the department level, however, may have affected the validity of the findings. In addition, aggregation may result in common methods bias and confusion of organizational levels, thus affecting the validity of the findings (Rousseau, 1985, 1978). Rousseau (1985) suggests that when individual level data are aggregated to measure unit characteristics, measures of interrater agreement be used to establish within-unit consensus. As reported earlier, all departments exhibited interrater reliability estimates of .94 or higher, thus reducing but not eliminating the limitations of using aggregated data in this study.

A similar issue is the categorization of variables based on their means for use in MANOVA models. This categorization was used for only three variables in this study: task complexity, input uncertainty, and cost of output measures, and thus affected only three hypotheses (5, 6, and 7). Generally, continuous variables were used in the regression models used to test these hypotheses, and the MANOVA results were used only to detect patterns of results and not to test the actual hypotheses, thus reducing the significance of this limitation. It appears, however, that the lack of significance for these three hypotheses was due to a preference for behavior controls in this sample rather than measurement issues.

Limitations affecting Generalizability

Two factors affect the generalizability of the results of this study. First is the cross-sectional nature of the research. Several variables would yield more information if studied longitudinally. A longitudinal study might yield more accurate perceptions or measures of environmental volatility. Changes in outcome measures might be related to changes in control systems or methods or changes in antecedents. Reactions to management-sponsored changes in structure or control could be measured (e.g., a company-wide changeover to self-management work teams).

Second, while restricting the sample to a single industry has the positive benefit of reducing confounding factors, it also limits generalizability. Industry-specific factors may serve to limit variance in the measures, thereby affecting analysis of the results. The types of measures available may also be determined by the choice of a single industry. It is possible that a number of results would change if another industry was used for the sample. For example, as discussed earlier, the findings suggest that hospitals may avoid the use of cultural controls even when they would lead to positive outcomes, due to liability or malpractice concerns. Risk aversion would probably not have the same effect in other industries. Also, using industries where the cost of

output measures would have high salience, as opposed to hospitals, where costs of measurement may be a secondary consideration due to the information value of measures, might lead to different results.

Suggestions for Future Research

There are a large number of issues that need further study, as would be expected in a study with an exploratory focus, a substantial number of new measures, and many variables and hypotheses. Future research is necessary to overcome the limitations of this study and to contribute further to the understanding of management control. Suggestions for future research are delineated in the following sections.

Empirical Investigation of Market Control

Market control was not included in the empirical testing of the model due to tractability. This portion of the control model, however, is worthy of further study. What are the antecedents of market control? What environmental factors influence the use of market control systems? How does the use of market control affect important organizational outcomes such as performance, job satisfaction, and organizational commitment?

Replication of the Study using Different Samples

As discussed earlier, it appears that characteristics common to health care organizations may have influenced some of the results of the study. For example, risk aversion appeared to moderate the relationship between technology and cultural control. It is likely that this relationship would have different characteristics in a non-health care sample where risk and liability issues are less a threat to the organization. Another example is the preference for behavior over output controls in this sample. In another industry or type of workplace, output controls might be viewed as less

intrusive than behavior controls and thus be preferred by workers. Also, it is possible that the organizations studied in this sample were not large enough for organization size to impact the results, whereas other samples might overcome this difficulty. A sample with a large number of organizations would allow for comparison of organization-level and department-level variables.

Another issue that may be sample or industry related is that of the availability of professionals and its effect on the use of professional versus ritual controls. It did not appear that a scarcity condition existed for the categories of professionals examined in this study; therefore scarcity had no effect on the type of supervisory control in use. It is possible that the hypothesized relationship might be supported in a sample where scarcity of professionals existed; it is also possible that the hypothesis is in need of modification. A different sample might help resolve that question.

Replication of the study in other samples is recommended. One interesting possibility would be to study a number of manufacturing organizations which also have research and development departments, marketing departments, legal departments, etc. In this way, the goal of finding a sufficiently heterogeneous sample, while moving away from the reliance on a single industry, would be possible. Given that both this study and the one by Davidson (1988) failed to find the extent of cultural or clan controls expected in either hospitals or auditing firms, respectively, it is possible that different types of organizations are necessary to find significant usage of cultural controls. One of the emerging phenomena in business in the use of self-managed work teams, which represent perhaps the most broad-scale trend toward cultural control systems to date. A sample that included self-managed work teams might yield important results. For example, does the positive relationship between department size and bureaucratic control continue to hold in departments consisting of self-managed teams? If technology is an important antecedent of control, then does technology either facilitate or discourage the use of self-managed work teams?

Perceived versus Actual Measures

Several unresolved issues relating to perceived versus actual measures were mentioned earlier. One such issue is the relative importance of perceived versus actual munificence and the interactions of each with environmental uncertainty. As mentioned earlier, munificence has typically been measured at either the industry level or the firm level. To test this issue at the department level would require access to actual and perceived measures of resource munificence at the department level in several organizations, as well as measures of munificence at the organization level. This would also allow for testing of the interrelationships of organization-wide munificence with department-level measures of munificence. There is little reason to expect a high correlation between perceived munificence at the department level and quantifiable measures of munificence at the organizational or industry level (c.f. Dess & Rasheed, 1991), but to date this issue has not been empirically addressed.

Another issue is perceived versus actual measures of department performance. Given the sample used in this study, only perceptual measures were feasible. It was not clear, however, whether top managers' perceptions of department performance accurately reflect actual performance variations. Empirically addressing this issue would require having measurements of actual performance available to the researchers, but not known by the managers providing the perceptual measures of performance; then comparisons of perceived and actual performance could be made. Since most organizations have at least some departments for which actual performance measures are not available, the issue of whether perceptual measures of department performance provide sufficient accuracy is an important one.

A related question is whether the availability of output measures enhances the ability to assess performance or whether managers merely have a higher comfort level when output measures of performance are available. This study did not attempt to

discover the confidence level that managers felt when assessing department performance. Were such a measure to be taken and compared with the availability of output measures, it might be possible to assess whether the information given by output measures or the comfort provided by their existence has the most impact on perceptual department performance measures.

The cost of output measures was also assessed using a perceptual measure because these costs were not available through the organizations' information systems. This made it possible to collect cost of output measures information on a wide variety of different departments, but resulted in such costs being expressed in non-currency terms. Replication of the study using a sample in which actual cost of output measures data was available through the organizational information system might allow for more accurate findings for those relationships affected by this variable.

Organization-Level Research

One of the contributions of this study is the extension to the department level of research often performed at the organizational level, and was necessary due to the levels of analysis specified by the study. Testing the management control model used in this study at the organizational level, however, is an important possibility for future research, in that much of the comparable research on size, technology, structure, and perceived environmental uncertainty has been performed at the organizational level. Depending on the design of the research, this might also allow for an investigation of the relative effects of organization-level and department-level variables, such as size and perceived environmental uncertainty measures, since the constructs may not be equivalent at different levels of the organization (Rousseau, 1985).

While this study found department size to be an important antecedent of bureaucratic versus cultural control systems, the sample size was not large enough to test the interaction of organization size with these variables. Many researchers have

recommended measuring size at the department level (David *et al.*, 1989; Van de Ven *et al.*, 1976; Lynch, 1974; Ford & Slocum, 1977; Comstock & Scott, 1977), although most studies have measured size at the organization level (e.g. Blau, 1970; Blau & Schoenherr, 1971; Pugh *et al.*, 1969; Marsh & Mannari, 1981). The interrelationship of organization size and department size has not been well investigated. Whether or not (or at what point) increased organization size offsets the effects of small department size on management control systems is a question worthy of further research. For example, it is possible that neither organization studied is large enough for organization size to have an effect on management control. Perhaps cultural control is likely only when both the organization size and department size are small, but not in other conditions. Additional research would be helpful in investigating these relationships.

Organizational-level measures of perceived environmental uncertainty might make it possible to determine the level of buffering affecting various departments in an organization. It is possible that measuring perceived environmental uncertainty at the department-level is inappropriate due to buffering of the technical or operational core of the organization. On the other hand, differential buffering of departments appears to be related to job satisfaction and organizational commitment, thus measures at both the organizational and departmental level would be necessary to investigate these effects.

Department-Level Research

As mentioned above, department-level responses were aggregated using individual responses in this study, as was necessary to measure such variables as goal congruence. Research at the department level without this limitation could provide an important contribution to the understanding of management control in departments. This would require specification of a single respondent to represent the department,

which has its own drawbacks in terms of validity, but avoids variance loss due to aggregation of responses. Or, as suggested by Rousseau (1985), each department could be split into two groups as part of the research design, with one group responding to the dependent-variable measures and the other to the independent-variable measures, thus avoiding common methods bias.

Development of Context-Specific Measures

It appears likely that several of the low-reliability measures, such as input uncertainty, task complexity, and availability of output controls, may be context-specific, and thus may not be fully captured using global or general measures. Observational forms of data collection may be necessary to understand the organizational context and develop measures appropriate to the context. Research in this area might facilitate the development of measures with higher reliabilities, and therefore allow for a better understanding of the relationships of these variables with output and behavior controls.

Variables not Included in this Study

Some variables not included in this study appear to be relevant for future study of these topics. One of these is the age of the organization and the age of the departments. It appears likely that the older the organization, the more likely that bureaucratic controls will be used (Mintzberg, 1979); the same may hold true for the age of the departments. Both hospitals included in this study were between thirty and fifty years old, making them neither especially old nor especially young.

Another variable of interest is departmental commitment. In this study, a widely-used measure of organizational commitment (Mowday, *et al.*, 1979) was used to measure commitment. But is organizational commitment the same as departmental commitment? Is it possible that people are more or less loyal to the department in

which they work than to the organization? If so, then a measure of departmental commitment should probably be used for research at the departmental level. A recent study (Hunt & Morgan, 1994) demonstrated that organizational commitment and several constituency-specific commitments were highly correlated, but did not specifically test department commitment. Instead, the authors suggested that this is an area worthy of further study.

Implications

A number of implications for researchers and practitioners can be derived from this research. These implications are explored in the following sections.

Implications for Researchers

This study did not find the extent of cultural control expected in a sample of health care professionals. Davidson (1988) found the same lack of cultural control in a sample of accounting professionals. It appears that the pervasiveness of bureaucratic control—especially behavior control—makes studying the antecedents and consequences of management control difficult. The existence of factors that impede cultural control, such as risk, tradition, or organizational age, results in a far lower amount of cultural control than expected. Researchers should carefully consider what types of organizations are likely to use substantial cultural controls.

This study demonstrated the importance of measuring goal congruence using multiple perspectives. Three different ways of conceptualizing goal congruence were used in this study because it was felt that different types of congruence might affect control systems and methods differently, as well as have a differential impact on the outcome variables. The results support this contention. Perhaps the clearest evidence of the differential effects of the three types of goal congruence is in their relationships with perceived department performance. Actual/perceived goal congruence was

positively related to perceived department performance, actual/actual goal congruence was negatively related to perceived department performance, and perceived/perceived goal congruence was not related to perceived department performance. This means that perceived department performance was higher when supervisors and employees perceived each others' goals to be similar to their own, but perceived performance was lower when there was actual agreement on goals.

Actual/perceived goal congruence was related positively to both job satisfaction and organizational commitment independently of its fits with ritual or professional control. In contrast, both actual/actual goal congruence and perceived/perceived goal congruence were related to job satisfaction and organizational commitment through their fits with ritual and professional control. These patterns, when combined, seem to indicate that actual/perceived goal congruence is more beneficial in terms of organizational outcomes than is actual/actual goal congruence or perceived/perceived goal congruence, in that actual/perceived goal congruence is positively related to each of the three outcome variables. In terms of maximizing outcomes, it appears to be more important that supervisors and their employees perceive their goals to be in agreement than for agreement to actually exist.

The three different types of goal congruence measured in this study exhibited different patterns of interactions with the other study variables, especially with the outcome variables of job satisfaction, organizational commitment, and performance. This implies that researchers should exercise care in specifying what is meant by the term goal congruence and should delineate what types of goal congruence are being studied.

This study also demonstrated the importance of using multiple measures of perceived environmental uncertainty, as recommended by Milliken (1987) and others. The different measures of perceived environmental uncertainty used in this study exhibited various different relationships to the control measures and outcome

variables. While it is convenient to think of perceived environmental uncertainty as a single construct, to treat it as such is unwarranted. In addition, this study demonstrated the importance of considering environmental munificence when studying the effects of the environment upon departmental outcomes. It also appears that perceived environmental uncertainty measures and resource munificence may have differential effects at the organizational and departmental levels. Measures should be taken at both levels to determine these effects.

The importance of using multiple measures of performance at the departmental level is indicated by this study. Otherwise, there is no way to discern to what extent performance ratings reflect actual performance differences and to what extent they represent bias or insufficient knowledge on the part of the raters. It appears that multiple raters do not ensure accurate ratings; instead multiple methods are recommended wherever feasible.

The importance of the departmental level of analysis when studying management control is also implied by this study. The antecedents of management control examined in this study have frequently been studied at the organizational rather than the departmental level. The results seem to indicate that a substantial variation in control systems can be observed at the departmental level, and that department size, structure, and levels of munificence are important antecedents of management control at that level. Many of the perceptual measures developed or adapted for this study can be used to facilitate control research at the departmental level. On the other hand, there appear to be some variables whose effects are determined largely at the organizational level. Determination of the proper level of analysis for studying various aspects of management control is a serious challenge for researchers.

Implications for Practitioners

One objective of this study was to benefit practitioners of management by enhancing their understanding of the management control process in organizations. The following implications for practitioners should be viewed as tentative due to the less-developed state of knowledge in this area, the exploratory nature of this study, and the need for future research.

The revised management control model based on the results of this study indicates that bureaucratic and cultural control flourish in significantly different situations. The patterns are relatively distinct at the extremes. Bureaucratic control is associated with large department size, mechanistic structure, routine technology, and low perceived environmental uncertainty (state certainty and effect certainty). This appears to describe a situation in which the workplace can be defined with some precision and thus the control mechanism can be bureaucratic in nature. When this pattern is observed in a department, the model indicates that bureaucratic control should be used, and that job satisfaction and performance will tend to be positively associated with this approach.

Cultural control, however, was associated with small department size, organic structure, high goal congruence, and a munificent resource environment. This pattern of antecedents implies a beneficent environment in which work relationships such as teamwork are encouraged, where resources have some slack, and where agreement exists on shared goals. In such situations, the model indicates that cultural controls should be used, with positive implications for job satisfaction and organizational commitment, if not for perceived department performance.

When these patterns of antecedents occur, it appears that the appropriate control system can be specified with some accuracy. The more common situation, however, is one in which the pattern of antecedents is mixed and some mixture of

bureaucratic and cultural controls should be used. Thus the revised model of management control antecedents (Figure 10) indicates a continuum of "more bureaucratic" control to "more cultural" control rather than the dichotomy presented in the original management control model (Figure 8). The supervisory control methods are also represented on the continuum, with output controls indicating the highest amount of control by management and the least control by the workgroup, and professional controls the least control by management and most by the workgroup.

A major difficulty illustrated by this study is the tendency of organizations to use bureaucratic controls, especially behavior controls, even where the antecedents call for substantial amounts of cultural control. These pressures may be especially intense in health care organizations, where external pressures for cost containment often result in the imposition of bureaucratic controls in professional departments (Abernethy & Stoelwinder, 1995). It appears that concerted effort and design are necessary to encourage the development of cultural controls (Hecksher, 1994). In addition, it appears to be difficult for individual departments to develop cultural controls if the organization is bureaucratic. It is possible that some departments might develop cultural controls if left alone or isolated—but such isolation is not likely in a bureaucratic organization.

This research also highlighted the importance of goal congruence to cultural control, especially ritual and professional controls. A shared values base must exist between supervisor and subordinate for these controls to work effectively. The necessity of a shared values base for ritual control is not surprising, but its necessity for professional control is somewhat surprising in that the shared values base of professionals is expected to originate outside the organization. This implies that supervisors may not allow employees the freedom to be controlled professionally unless a shared values base exists (Weiner, 1988). It is possible that supervisors respond to incongruent goals by the imposition of organizationally-based controls. It

is also possible that incongruent goals may lead to the severing of the relationship of the professional with the organization; thus at any point in a cross-sectional research design there will be a positive relationship between goal congruence and professional control for those professionals in a work relationship with the organization. The implication for professionals appears to be the importance of agreement with a supervisor's goals and the accompanying freedom to be controlled professionally.

The different patterns associated with the antecedents of job satisfaction, organizational commitment, and department performance contain important implications for practitioners. Since it is difficult to maximize all outcomes simultaneously, it appears that practitioners may need to choose which outcomes are most important for a workgroup at a particular time, and make managerial control choices accordingly. The only variable tested in the study that had a positive impact on all three outcomes was actual/perceived goal congruence; therefore efforts toward congruent perceptions of department goals may result in higher levels of all three outcomes.

Perhaps the most troubling implication is the relationship of ritual control to the three outcomes. Ritual control was positively associated with job satisfaction and organizational commitment, but negatively associated with perceived department performance. Thus there appears to be conflicting effects of ritual control on the three major outcome variables specified by this study. This conflict is consistent with other research (Bateman & Organ, 1983; Porter & Lawler, 1968), in that the premise that higher job satisfaction leads to higher performance has rarely been confirmed.

These findings may indicate the existence of a perceptual chasm between workers and top managers, at least in this sample. From the workers' viewpoint, ritual control methods result in higher levels of job satisfaction and organizational commitment. From the top managers' perspective, ritual controls, as discussed earlier, may lead to difficulties in assessing department performance. The availability of

output measures may enhance top management's ability to assess performance, but the resulting bureaucratic forms of control do not contribute as positively to job satisfaction and organizational commitment. An understanding by top managers of these dynamics might make it possible for ritual controls to be used, accompanied by increased job satisfaction and organizational commitment, while also allowing for non-biased perceptions of department performance.

Perceived environmental uncertainty variables generally were negatively related to both job satisfaction and organizational commitment. The hospital setting for this study may have influenced these findings, given the turbulent nature of the health care field over the past several years. Often practitioners have little control over environmental variables, but managers may want to attempt to buffer the perceptions of environmental uncertainty that their workers must contend with. The extent to which most workers feel this uncertainty may be influenced to some degree by managers of the organization. The lower levels of organizational commitment in uncertain environments may imply that workers are less willing to commit to an organization that they perceive as inherently unstable. Managers may want to attempt to influence such perceptions for the benefit of the organization.

As was discussed earlier, it was unclear whether the ratings given by top managers of perceived department performance were accurate. Two patterns of ratings, however, appeared to emerge. The first was assigning higher ratings of performance when actual measures of output were available. This resulted in higher performance ratings for those departments which had more measurable outputs than for those which did not. Since practitioners frequently are in positions where performance ratings must be given and few actual measures of output exist, managerial awareness of this tendency may lead to more accurate performance assessments. The second is that executives assigned lower performance ratings to departments using ritual controls. It may be that such departments are viewed as "clannish," and are

therefore subconsciously discriminated against in performance assessment. Given the increasing use of self-managed work groups and other ritual forms of control, this tendency should be guarded against.

Since it appears to be challenging to maximize job satisfaction, organizational commitment, and perceived department performance simultaneously, practitioners may need to choose which of these outcomes are most important at a given time, and make managerial control choices accordingly. Where such choices are not clear or the antecedents of bureaucratic and cultural control are mixed, the practitioner may want to err on the side of cultural control, thus deliberately moving away from the bureaucratic control default. Of course, if risk management issues indicate the use of behavior control, then using cultural controls might be counterproductive. The use of cultural controls may reduce perceived department performance; this may or may not affect actual performance. At the same time, the use of cultural controls should result in increased job satisfaction and organizational commitment, which appear to be enhanced by cultural control. Some methods for encouraging cultural control follow.

In this study, two factors were examined that may lead to less use of cultural control than is appropriate given department characteristics. The first has already been mentioned—the tendency to assign lower performance ratings to departments using high levels of ritual control. The second is risk aversion caused by legal or other concerns. While it may be necessary to use more bureaucratic control methods than would otherwise be appropriate so that the organization is protected legally or financially (Abernethy & Stoelwinder, 1995), such protection may come with a price in terms of job satisfaction and organizational commitment. Managers may want to carefully assess bureaucratic requirements to make sure they are necessary for the well-being of the organization, and make note of the tradeoffs inherent in such choices. It should be noted that the tendency toward the use of behavior controls might be detrimental to hospitals in their transition toward more cost-effective methods of

operation. It usually is quite expensive to engage in the constant monitoring of employee activity required by behavior controls.

Small department size appears to facilitate the development of the shared meanings and values necessary for cultural control. While self-managed work groups have proliferated recently, corporate downsizing has promoted an opposing trend toward larger departments and larger spans of control. Where larger department sizes are necessary, managers may want to divide departments into smaller groups in which cultural control can more easily develop.

Perceptions of resource munificence were also associated with cultural control. It may be that munificence creates slack which makes tight budgetary controls less necessary; as a result cultural forms of control develop more easily. To encourage cultural control, therefore, may require a commitment of resources so that a lack of munificence does not threaten the process. It is important to note, however, that perceived munificence rather than actual munificence is the variable of interest in this study. Managers may be able to influence perceptions of munificence, to some extent, regardless of actual levels of munificence. Those who help their employees to perceive more munificence may reap the benefits in increased job satisfaction and organizational commitment.

Conclusions

This study had two purposes. The first was to develop a comprehensive model of management control in organizations. The second was to test a significant portion of the newly-developed model. The extent to which this study fulfilled these purposes is explored below.

Model Development

There were several objectives for developing a comprehensive model of management control. The first was to create a better understanding of the management control process. This objective was achieved in that testing the hypotheses results in an increased knowledge of the process of management control. For example, the hypothesized roles of context factors and structure as antecedents of management control systems were largely supported, but the pattern of results indicated different patterns of antecedents of bureaucratic and cultural control.

The second objective in testing the comprehensive model was to add to the empirical base in the control field. This objective was clearly reached. One way in which this was done was by examining the relationships of the context variables of technology, department size, and perceived environmental uncertainty and management control. Many studies have studied the relationship of these context variables and structure (e.g. Kraft, 1993; David *et al.*, 1989; Slocum & Sims, 1980; Abdel-khalik, 1988; Mileti *et al.*, 1977; Child, 1973a; Koberg & Ungson, 1987), but few have studied their relationships with management control.

The third fulfilled objective was to test a sample of a different type of organization than those used in most other management control studies. Another objective was to increase the breadth of the domain examined in an empirical study of management control systems; this objective was attained. The last objective in creating a comprehensive management control model was to integrate some of the varied foci of researchers. In bringing together literature from several perspectives and including several approaches in the model, this objective was largely achieved.

Model Testing

The second major purpose of this study was to test a significant portion of the comprehensive management control model. In the sense that the model was subjected

to empirical testing, this objective was reached. In doing so, the insights gained from subjecting the model to testing were expected to allow for a greater understanding of the management control process than has previously been available. This objective was partially fulfilled in that both supported and non-supported hypotheses increase understanding of the control process. This objective was partially unfulfilled, however, in that it is impossible to determine, without further study, if lack of support for some of the hypotheses is due to insufficient theoretical underpinnings of the model or due to sample and measurement limitations. Suggestions for overcoming these limitations have been included.

Summary

This research project began with the development of a comprehensive model of management control at the departmental level in organizations. Hypotheses were developed to test a significant portion of the model. Two-thirds of the hypotheses were either strongly or partially supported, while one-third were not. The meaning of the patterns of the results was discussed, and a revised model of management control based on the results was presented. The limitations of the study were discussed and suggestions for overcoming those limitations and for furthering knowledge development in the managerial control field were presented. Implications for researchers and practitioners were also examined. As a result, this study makes a contribution to the understanding of management control at the department level in organizations. This study also contributes to the understanding of contextual and structural factors as they relate to management control, and contributes to the understanding of methods for maximizing the outcomes of performance, job satisfaction, and organizational commitment.

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APPENDIXES

APPENDIX A

SUPERVISOR SURVEY

SUPERVISOR/MANAGER SURVEY

Think about the tasks that you perform as part of your job.

How many of these tasks are the same from day-to-day?	Very Few 1	2	3	4	5	6	Most of them 7
To what extent would you say that your work is routine?	To a Small Extent 1	2	3	4	5	6	To a great Extent 7
People in this unit do about the same job in the same way most of the time.	1	2	3	4	5	6	7
Basically, unit members perform repetitive activities in doing their jobs.	1	2	3	4	5	6	7
How repetitious are your duties?	1	2	3	4	5	6	7
To what extent is there a clearly known way to do the major types of work you normally encounter?	1	2	3	4	5	6	7
To what extent is there a clearly defined body of knowledge of subject matter which can guide you in doing your work?	1	2	3	4	5	6	7
To what extent is there an understandable sequence of steps that can be followed in doing your work?	1	2	3	4	5	6	7
To do your work, to what extent can you actually rely on established procedures and practices?	1	2	3	4	5	6	7
To what extent is there an understandable sequence of steps that can be followed in carrying out your work?	1	2	3	4	5	6	7

Below are a series of paired comparisons. Please circle a number on the scale to describe where your department stands in comparison to the statements.

Most communication written and distributed	1	2	3	4	5	Little written communication
Communication is expected to follow official channels	1	2	3	4	5	There is freedom to communicate across organizational lines at any time
All orders must come from management	1	2	3	4	5	Lower-level employees are free to use their own initiative
Superiors and subordinates have large rank differences	1	2	3	4	5	Superiors and subordinates have only slight rank differences
Individual jobs are clearly defined	1	2	3	4	5	Individual jobs are not clearly defined
Duties never cross departmental lines	1	2	3	4	5	Duties frequently cross departmental lines
The structure is tall and narrow	1	2	3	4	5	The structure is flat and wide
Decision-making authority is based on managerial position	1	2	3	4	5	Decision-making authority is based on individual expertise
Major strategic decisions are made by top management	1	2	3	4	5	Major strategic decisions are made by the departments affected by the decision

The lines of authority are precisely defined	1	2	3	4	5	The lines of authority are not precisely defined
Communication concerning job-related matters moves vertically up-and-down throughout the organization	1	2	3	4	5	Communication concerning job-related matters goes in all directions
When working on a project, I interact mainly with my own supervisor	1	2	3	4	5	When working on a project, I interact mainly with people other than my supervisor
When my supervisor talks to me, most of his/her communication is orders and instructions	1	2	3	4	5	When my supervisor talks to me, most of his/her communication is information and advice
My supervisor decides what the work group should do	1	2	3	4	5	The work group decides what it should do
When your work group begins a new job or project, each individual has a a predefined role to play	1	2	3	4	5	When your work group begins a new job or project, roles are negotiated

Please indicate your level of agreement or disagreement with the following statements.

	Strongly Disagree			Neither			Strongly Agree
There are written rules or procedures for the tasks that my subordinates perform	1	2	3	4	5	6	7
For most of the tasks that my subordinates perform, there is some sort of written documentation of their performance	1	2	3	4	5	6	7
I closely monitor the performance of my subordinates	1	2	3	4	5	6	7
When a vacancy occurs in this department, there is an emphasis on hiring a person with the right technical skills	1	2	3	4	5	6	7
The organization requires and emphasizes continued technical training	1	2	3	4	5	6	7
Rules, regulations, and paperwork seem to be very important to the organization	1	2	3	4	5	6	7
In this department, there is an emphasis on formal planning and scheduling	1	2	3	4	5	6	7
Compared with other departments, we have a lot of paperwork	1	2	3	4	5	6	7
When a vacancy occurs in this department, there is an emphasis on hiring someone compatible with the goals of the department	1	2	3	4	5	6	7
When I began working in this department, my colleagues went out of their way to help me understand how things are done here	1	2	3	4	5	6	7
Most people that work in this department view work-related issues in similar ways	1	2	3	4	5	6	7
People in this department work together to get things done	1	2	3	4	5	6	7
There is a strong sense of community and belongingness in this department	1	2	3	4	5	6	7
Experienced department members see advising or training new workers as one of their most important responsibilities	1	2	3	4	5	6	7
Compared with other departments, we have very few rules	1	2	3	4	5	6	7

	Strongly Disagree			Neither			Strongly Agree
When I began working in this department, I gained a clearer understanding of my role by observing my fellow workers	1	2	3	4	5	6	7
Compared with other departments, we have very little paperwork	1	2	3	4	5	6	7
I have modified my work habits to be more consistent with those of my fellow workers	1	2	3	4	5	6	7
Rules, regulations, and paperwork seem to be very important in this department	1	2	3	4	5	6	7
The culture of this department influences me to do a good job	1	2	3	4	5	6	7
Keeping detailed and accurate records is very important in department	1	2	3	4	5	6	7
Because of the way my job is, I must often think about what I'm doing	1	2	3	4	5	6	7
My job would be easy for someone to learn	1	2	3	4	5	6	7
My job performance depends on how well others do their jobs	1	2	3	4	5	6	7
I have to talk to other workers to get my job done	1	2	3	4	5	6	7
After I work on something, I must give it to someone else before it is finished	1	2	3	4	5	6	7
Generally speaking, I am very satisfied with this position	1	2	3	4	5	6	7
I often think about quitting	1	2	3	4	5	6	7
I am generally satisfied with the kind of work that I do in this position	1	2	3	4	5	6	7
Most people that work here are very satisfied with their positions	1	2	3	4	5	6	7
People in this organization often think of quitting	1	2	3	4	5	6	7
Many of the work rules we follow have been designed to reduce the organization's exposure to legal liability	1	2	3	4	5	6	7
It is difficult to allow my subordinates much freedom to control their own work due to the potential of litigation	1	2	3	4	5	6	7
The risks of allowing my subordinates more freedom to control they own work outweigh the benefits	1	2	3	4	5	6	7

In your opinion, to what extent are the rules or procedures that your subordinates must follow designed to:

	Absolutely No Effect					To a Great Extent	
Protect the organization against lawsuits	1	2	3	4	5	6	7
Provide effective health care	1	2	3	4	5	6	7
Reduce or contain costs	1	2	3	4	5	6	7
Reduce the possibility of malpractice litigation	1	2	3	4	5	6	7

Over the coming year, to what extent do you expect changes in the following factors to effect the way in which you perform your job?

	Absolutely No Effect						To a Great Extent
Increases in AIDS patients	1	2	3	4	5	6	7
Changes in technology	1	2	3	4	5	6	7
Increases in crime	1	2	3	4	5	6	7
Changes in the economy	1	2	3	4	5	6	7
Changes in hospital leadership	1	2	3	4	5	6	7
Changes in the patient census level	1	2	3	4	5	6	7
Personnel changes in the department	1	2	3	4	5	6	7
Force reductions	1	2	3	4	5	6	7
Changes in the hospital structure	1	2	3	4	5	6	7

To what extent do you assess the work performance of your subordinates using each of the following factors?

	Not at All						To a great Extent
Specific measures of the quantity of their output	1	2	3	4	5	6	7
Subjective ratings of their attitudes	1	2	3	4	5	6	7
Subjective ratings of their work habits	1	2	3	4	5	6	7
Peer review by their co-workers	1	2	3	4	5	6	7
Peer review by their professional colleagues	1	2	3	4	5	6	7
Their own opinion of their work performance	1	2	3	4	5	6	7

When there is a problem with the work performance of a subordinate, to what extent do each of the following factors help to make you aware of the problem?

	Not at All						To a great Extent
Specific records of the quantity of their work	1	2	3	4	5	6	7
Observation of their work behavior	1	2	3	4	5	6	7
Observation of their work behavior by their co-workers	1	2	3	4	5	6	7
Observation of their work behavior by their professional colleagues	1	2	3	4	5	6	7
Their own observations of their work performance	1	2	3	4	5	6	7

To what extent does each of the following factors help you to know when a subordinates has done a good job?

	Not at All						To a great Extent
Specific records of the quantity of their work	1	2	3	4	5	6	7
Observation of their work behavior	1	2	3	4	5	6	7
Observation of their work behavior by their co-workers	1	2	3	4	5	6	7
Observation of their work behavior by their professional colleagues	1	2	3	4	5	6	7
Their own observations of their work performance	1	2	3	4	5	6	7

To what extent do each of the following factors influence or establish the standards by the performance of your subordinates is judged?

	Not at All						To a great Extent
Written standards for the quantity of their output	1	2	3	4	5	6	7
Written standards for the quality of their output	1	2	3	4	5	6	7
Unwritten standards communicated by their co-workers	1	2	3	4	5	6	7
Written standards of a professional group of which they are a member	1	2	3	4	5	6	7
Unwritten standards of a professional group of which they are a member	1	2	3	4	5	6	7
Their own standards concerning the quality or quantity of their work	1	2	3	4	5	6	7
To what extent are you able to accurately assess the work performance of your subordinates?	1	2	3	4	5	6	7
To what extent are co-workers in your department able to accurately assess the work performance of your subordinates?	1	2	3	4	5	6	7
To what extent are your subordinates able to accurately assess their own work performance?	1	2	3	4	5	6	7

Think of a critical incident or change in the organization's environment that would require you to make a decision. In thinking about this factor:

	Never						Always
How often do you feel you have the information you need to understand how this factor will change in the future?	1	2	3	4	5	6	7
How often do you believe that the information you have about this factor is adequate for decision-making?	1	2	3	4	5	6	7
How often is it difficult for you to get the necessary information about this factor for decision-making?	1	2	3	4	5	6	7
How often is it difficult to obtain additional information about this factor when you need it for decision-making?	1	2	3	4	5	6	7
How often is it difficult for you to predict which environmental factors and components will be important considerations in future decisions?	1	2	3	4	5	6	7
How often do you feel that you are able to predict how this factor will affect decisions made by management?	1	2	3	4	5	6	7
How often can you predict the impact that this change will have on the success or failure of your work?	1	2	3	4	5	6	7
	Unsure						Sure
How sure are you that this change will affect the success or failure of your work?	1	2	3	4	5	6	7
Before a decision is made, how sure are you of the affect this change will have on the decision?	1	2	3	4	5	6	7

Once you are aware of a critical change in the organization's environment, what length of time is typically required before you have feedback or information that will tell you how it will affect your work? (circle the appropriate response)

1 day 2 days 1 week 1 month 6 months 1 year 2 + years

	Strongly Disagree			Neither			Strongly Agree
When weighing the various alternatives for responding to change, it is difficult to decide which of these alternatives is likely to be most effective in the long run.	1	2	3	4	5	6	7
I cannot accurately assess the relative effectiveness of various alternatives because there are so many unknowns that can influence the effectiveness of each alternative.	1	2	3	4	5	6	7
In the face of these changes, to some extent I will just have to guess which strategy will produce the most desirable outcome for my department.	1	2	3	4	5	6	7
It is difficult to determine exactly what alternatives are available for responding to these changes.	1	2	3	4	5	6	7
	Less than One month						More than One year
How long do you think it would take for an inexperienced person to learn the basics necessary to handling your job?	1	2	3	4	5	6	7

Think of the time that you spend working directly with clients or patients.

	Never						Always
To what extent are the decisions you make in working with clients or patients dissimilar from one day to the next?	1	2	3	4	5	6	7
Think of all the kinds of events which affect your work with clients or patients. How often would you say you are able to anticipate and predict the nature of those events?	1	2	3	4	5	6	7
Many jobs require the use of searching procedures of one kind or another in solving client or patient problems. To what extent are the searching procedures you use dissimilar from one day to the next?	1	2	3	4	5	6	7
How often do you meet clients or patients with problems you have never encountered before?	1	2	3	4	5	6	7
	Strongly Disagree			Neither			Strongly Agree
The administration of this hospital is sincere in its attempt to meet the workers' point of view	1	2	3	4	5	6	7
I feel confident that the hospital will always try to treat me fairly	1	2	3	4	5	6	7
Our hospital's administration would be quite prepared to gain advantage by deceiving the workers	1	2	3	4	5	6	7
Our hospital has a poor future unless it can attract better administrators	1	2	3	4	5	6	7
The administration can be trusted to make sensible decisions for the hospital's future	1	2	3	4	5	6	7
The administration seems to do an efficient job	1	2	3	4	5	6	7
The time that I spend working with clients or patients is the most challenging part of my job.	1	2	3	4	5	6	7
Responding to the needs of clients or patients is very demanding	1	2	3	4	5	6	7
I seldom find my work with clients or patients to be challenging	1	2	3	4	5	6	7
My interactions with clients or patients often become intense	1	2	3	4	5	6	7
I rarely find working with clients or patients to be difficult	1	2	3	4	5	6	7

What percentage of your work time do you spend in contact with clients or patients? _____%

To what extent does your knowledge about how to perform your job come from each of the following sources?

	To a Small Extent						To a Great Extent
Superiors	1	2	3	4	5	6	7
Co-workers who are not members of your profession	1	2	3	4	5	6	7
Co-workers who are members of your profession	1	2	3	4	5	6	7
Members of your profession outside of the workplace	1	2	3	4	5	6	7

To what extent do you rely on each of the following groups for assistance when you have a job-related question or problem?

	To a Small Extent						To a Great Extent
Superiors	1	2	3	4	5	6	7
Co-workers who are not members of your profession	1	2	3	4	5	6	7
Co-workers who are members of your profession	1	2	3	4	5	6	7
Members of your profession outside of the workplace	1	2	3	4	5	6	7

To what extent do you model your own work behavior after that of the following groups?

	To a Small Extent						To a Great Extent
Superiors	1	2	3	4	5	6	7
Co-workers who are not members of your profession	1	2	3	4	5	6	7
Co-workers who are members of your profession	1	2	3	4	5	6	7
Members of your profession outside of the workplace	1	2	3	4	5	6	7

In the left-hand column, please indicate how important each of the following items is to you. In the right-hand column, indicate how important you feel that item is to your supervisor. Use the following scale for your ratings:

1 = not important at all
2 = very little importance
3 = somewhat important
4 = very important
5 = extremely important

Importance to You						Importance to Your Subordinates				
1	2	3	4	5	Providing a quality service	1	2	3	4	5
1	2	3	4	5	Building relationships within this department	1	2	3	4	5
1	2	3	4	5	Getting as much work done as possible	1	2	3	4	5
1	2	3	4	5	Accomplishing work in a safe manner	1	2	3	4	5
1	2	3	4	5	Maintaining high morale in this department	1	2	3	4	5
1	2	3	4	5	Working together with department members	1	2	3	4	5

Importance to You						Importance to Your Subordinates				
1	2	3	4	5	Promoting open and honest communication	1	2	3	4	5
1	2	3	4	5	Developing individual skills and abilities	1	2	3	4	5
1	2	3	4	5	Building relationships with other departments	1	2	3	4	5
1	2	3	4	5	Increasing the output of the department	1	2	3	4	5
1	2	3	4	5	Increasing the size of the department	1	2	3	4	5
1	2	3	4	5	Finding better ways to accomplish tasks	1	2	3	4	5

Listed below are a series of statements that represent possible feelings that individuals might have about the company or organization for which they work. With respect to your own feelings about company name, *please indicate the degree of your agreement or disagreement with each statement.*

	Strongly Disagree			Neither			Strongly Agree
I am willing to put in a great deal of effort beyond that normally expected in order to help this organization to be successful	1	2	3	4	5	6	7
I talk up this organization to my friends as a great organization to work for	1	2	3	4	5	6	7
I feel very little loyalty to this organization	1	2	3	4	5	6	7
I would accept almost any type of job assignment in order to keep working for this organization	1	2	3	4	5	6	7
I find that my values and the organization's values are very similar	1	2	3	4	5	6	7
I am proud to tell others that I am part of this organization	1	2	3	4	5	6	7
I could just as well be working for a different organization as long as the type of work was similar	1	2	3	4	5	6	7
This organization really inspires the very best in me in the way of job performance	1	2	3	4	5	6	7
It would take very little change in my present circumstances to cause me to leave this organization	1	2	3	4	5	6	7
I am extremely glad that I chose this organization to work for over those I was considering at the time I joined	1	2	3	4	5	6	7
There's not too much to be gained by sticking with this organization indefinitely	1	2	3	4	5	6	7
Often, I find it difficult to agree with this organization's policies on important matters relating to its employees	1	2	3	4	5	6	7
I really care about the fate of this organization	1	2	3	4	5	6	7
For me, this is the best of all possible organizations for which to work	1	2	3	4	5	6	7
Deciding to work for this organization was a definite mistake on my part	1	2	3	4	5	6	7

	YES	NO
In some organizations, records are kept for each employee which show his or her output--for example, number of tests processed, number of patients served, etc. As a supervisor, do you have access to such records of your subordinates' individual output?	( )	( )

To what extent does each of the following items explain why records of each employee's output are not kept?

	To a Small Extent						To a Great Extent
My subordinates are involved in group tasks where individual outputs are not easily distinguished	1	2	3	4	5	6	7
Individual output records could be kept, but doing so would require too much paperwork	1	2	3	4	5	6	7
Individual output records could be kept, but the cost of doing so outweighs the benefits of keeping such records	1	2	3	4	5	6	7
The variety of tasks that must be performed by my subordinates is such that, even if I kept records of their outputs, the records would be meaningless	1	2	3	4	5	6	7
The output of my subordinates is simply not measurable in a concrete manner	1	2	3	4	5	6	7

As a department head, how would you rate the availability of the following resources for accomplishing departmental objectives?

	Very Inadequate						Very Adequate
Staff	1	2	3	4	5	6	7
Medical equipment	1	2	3	4	5	6	7
Computer equipment	1	2	3	4	5	6	7
Space	1	2	3	4	5	6	7
Funding for staff pay increases	1	2	3	4	5	6	7
Funding for other departmental needs	1	2	3	4	5	6	7

	Becoming Much More Difficult			Staying About the Same			Becoming Much Easier
How would you describe the trend in obtaining resources?	1	2	3	4	5	6	7

BIOGRAPHICAL INFORMATION

The following information is needed for making statistical comparisons. Please answer each question to the best of your ability. **THIS INFORMATION IS COMPLETELY CONFIDENTIAL**, and will only be used in aggregate form, not for individual comparisons.

Approximately how many years of professional training have you received? ....._____

Approximately how long have you worked:

in your profession? ....._____
at this employer? ....._____
in your current department? ....._____
in your present position? ....._____

How many different positions have you held with this organization?....._____

Please indicate your present work status:

( )[1] Part-time employee: Approximate hours/week?....._____
( )[2] Full-time employee
( )[3] Volunteer: Approximate hours/week? ....._____
( )[4] Other (Please describe) _____

Which of the following best describes your work shift?

( )[1] Day Shift
( )[2] Evening Shift
( )[3] Night Shift
( )[4] Rotation
( )[5] Does not apply

From the following list, please indicate your primary department/cost center.

( )[1]	Accounting	( )[21]	Early Day Treatment	( )[41]	Outpatient Psych
( )[2]	Administration	( )[22]	Electrophysiology	( )[42]	Pediatric Inpatient unit
( )[3]	Admissions/Intake	( )[23]	Employee Benefits	( )[43]	Pharmacy
( )[4]	Adolescent Unit	( )[24]	Employee Health	( )[44]	Physical Rehab
( )[5]	AHN	( )[25]	Genetics Lab	( )[45]	Psych Testing Center
( )[6]	Art Therapy	( )[26]	Group Homes	( )[46]	Psychology
( )[7]	Building Operations	( )[27]	Hotel Operations	( )[47]	Purchasing
( )[8]	Business Office	( )[28]	Human Resources	( )[48]	Quality Assurance
( )[9]	Central Supplies	( )[29]	Laundry	( )[49]	Radiology
( )[10]	Chapman Research	( )[30]	Library	( )[50]	Risk Management
( )[11]	Chemical Dependency	( )[31]	Link Project	( )[51]	Social Services
( )[12]	Child Care Center	( )[32]	Management Systems	( )[52]	Special Care
( )[13]	Childrens North	( )[33]	Marketing	( )[53]	Special Education
( )[14]	Childrens South	( )[34]	Medical Education	( )[54]	Speech/Audiology
( )[15]	Clinical Lab	( )[35]	Medical Records	( )[55]	TCYH
( )[16]	Contributions	( )[36]	NCS	( )[56]	Vocational Training Ctr
( )[17]	Day Treatment	( )[37]	Nursing Administration	( )[57]	Volunteer
( )[18]	Dietary	( )[38]	Occupational Therapy	( )[58]	Westbank
( )[19]	Directions	( )[39]	Orthoptics	( )[59]	Word Processing
( )[20]	E.C.D. Psych	( )[40]	Outpatient Pediatrics		

What is your job title? ....._____

Who is your primary supervior? ....._____

Please indicate the highest level of education that you have received:

( )[1] Some high school
( )[2] High school graduate
( )[3] Some college, no degree
( )[4] Associate degree
( )[5] Bachelor's degree
( )[6] Master's Degree
( )[7] M.D. or D.O.
( )[8] Ph.D.

What is your current age? ....._____

What is your sex? ( )[1] Male ( )[2] Female

What percentage of your total household income is provided by your employment in this position? (If working as a volunteer, please put a zero.) ....._____%

APPENDIX B

EMPLOYEE SURVEY

EMPLOYEE SURVEY

Think about the tasks that you perform as part of your job.

How many of these tasks are the same from day-to-day?	Very Few 1	2	3	4	5	6	Most of them 7
To what extent would you say that your work is routine?	To a Small Extent 1	2	3	4	5	6	To a great Extent 7
People in this unit do about the same job in the same way most of the time.	1	2	3	4	5	6	7
Basically, unit members perform repetitive activities in doing their jobs.	1	2	3	4	5	6	7
How repetitious are your duties?	1	2	3	4	5	6	7
To what extent is there a clearly known way to do the major types of work you normally encounter?	1	2	3	4	5	6	7
To what extent is there a clearly defined body of knowledge of subject matter which can guide you in doing your work?	1	2	3	4	5	6	7
To what extent is there an understandable sequence of steps that can be followed in doing your work?	1	2	3	4	5	6	7
To do your work, to what extent can you actually rely on established procedures and practices?	1	2	3	4	5	6	7
To what extent is there an understandable sequence of steps that can be followed in carrying out your work?	1	2	3	4	5	6	7

Below are a series of paired comparisons. Please circle a number on the scale to describe where your department stands in comparison to the statements.

Most communication written and distributed	1	2	3	4	5	Little written communication
Communication is expected to follow official channels	1	2	3	4	5	There is freedom to communicate across organizational lines at any time
All orders must come from management	1	2	3	4	5	Lower-level employees are free to use their own initiative
Superiors and subordinates have large rank differences	1	2	3	4	5	Superiors and subordinates have only slight rank differences
Individual jobs are clearly defined	1	2	3	4	5	Individual jobs are not clearly defined
Duties never cross departmental lines	1	2	3	4	5	Duties frequently cross departmental lines
The structure is tall and narrow	1	2	3	4	5	The structure is flat and wide
Decision-making authority is based on managerial position	1	2	3	4	5	Decision-making authority is based on individual expertise
Major strategic decisions are made by top management	1	2	3	4	5	Major strategic decisions are made by the departments affected by the decision

The lines of authority are precisely defined	1	2	3	4	5	The lines of authority are not precisely defined
Communication concerning job-related matters moves vertically up-and-down throughout the organization	1	2	3	4	5	Communication concerning job-related matters goes in all directions
When working on a project, I interact mainly with my own supervisor	1	2	3	4	5	When working on a project, I interact mainly with people other than my supervisor
When my supervisor talks to me, most of his/her communication is orders and instructions	1	2	3	4	5	When my supervisor talks to me, most of his/her communication is information and advice
My supervisor decides what the work group should do	1	2	3	4	5	The work group decides what it should do
When your work group begins a new job or project, each individual has a a predefined role to play	1	2	3	4	5	When your work group begins a new job or project, roles are negotiated

Please indicate your level of agreement or disagreement with the following statements.

	Strongly Disagree			Neither			Strongly Agree
There are written rules or procedures for the tasks that I perform	1	2	3	4	5	6	7
For most of the tasks that I perform, there is some sort of written documentation of my performance	1	2	3	4	5	6	7
My supervisor closely monitors my performance	1	2	3	4	5	6	7
When a vacancy occurs in this department, there is an emphasis on hiring a person with the right technical skills	1	2	3	4	5	6	7
The organization requires and emphasizes continued technical training	1	2	3	4	5	6	7
Rules, regulations, and paperwork seem to be very important to the organization	1	2	3	4	5	6	7
In this department, there is an emphasis on formal planning and scheduling	1	2	3	4	5	6	7
Compared with other departments, we have a lot of paperwork	1	2	3	4	5	6	7
When a vacancy occurs in this department, there is an emphasis on hiring someone compatible with the goals of the department	1	2	3	4	5	6	7
When I began working in this department, my colleagues went out of their way to help me understand how things are done here	1	2	3	4	5	6	7
Most people that work in this department view work-related issues in similar ways	1	2	3	4	5	6	7
People in this department work together to get things done	1	2	3	4	5	6	7
There is a strong sense of community and belongingness in this department	1	2	3	4	5	6	7
Experienced department members see advising or training new workers as one of their most important responsibilities	1	2	3	4	5	6	7
Compared with other departments, we have very few rules	1	2	3	4	5	6	7

	Strongly Disagree			Neither			Strongly Agree
When I began working in this department, I gained a clearer understanding of my role by observing my fellow workers	1	2	3	4	5	6	7
Compared with other departments, we have very little paperwork	1	2	3	4	5	6	7
I have modified my work habits to be more consistent with those of my fellow workers	1	2	3	4	5	6	7
Rules, regulations, and paperwork seem to be very important in this department	1	2	3	4	5	6	7
The culture of this department influences me to do a good job	1	2	3	4	5	6	7
Keeping detailed and accurate records is very important in department	1	2	3	4	5	6	7
Because of the way my job is, I must often think about what I'm doing	1	2	3	4	5	6	7
My job would be easy for someone to learn	1	2	3	4	5	6	7
My job performance depends on how well others do their jobs	1	2	3	4	5	6	7
I have to talk to other workers to get my job done	1	2	3	4	5	6	7
After I work on something, I must give it to someone else before it is finished	1	2	3	4	5	6	7
Generally speaking, I am very satisfied with this position	1	2	3	4	5	6	7
I often think about quitting	1	2	3	4	5	6	7
I am generally satisfied with the kind of work that I do in this position	1	2	3	4	5	6	7
Most people that work here are very satisfied with their positions	1	2	3	4	5	6	7
People in this organization often think of quitting	1	2	3	4	5	6	7
Many of the work rules we follow have been designed to reduce the organization's exposure to legal liability	1	2	3	4	5	6	7
The freedom to control my own work has been limited due to the fear of litigation	1	2	3	4	5	6	7
The benefits of having more freedom to control my own work would outweigh the risks	1	2	3	4	5	6	7

In your opinion, to what extent are the rules or procedures that you follow designed to:

	Absolutely No Effect					To a Great Extent	
Protect the organization against lawsuits	1	2	3	4	5	6	7
Provide effective health care	1	2	3	4	5	6	7
Reduce or contain costs	1	2	3	4	5	6	7
Reduce the possibility of malpractice litigation	1	2	3	4	5	6	7

Over the coming year, to what extent do you expect changes in the following factors to effect the way in which you perform your job?

	Absolutely No Effect						To a Great Extent
Increases in AIDS patients	1	2	3	4	5	6	7
Changes in technology	1	2	3	4	5	6	7
Increases in crime	1	2	3	4	5	6	7
Changes in the economy	1	2	3	4	5	6	7
Changes in hospital leadership	1	2	3	4	5	6	7
Changes in the patient census level	1	2	3	4	5	6	7
Personnel changes in the department	1	2	3	4	5	6	7
Force reductions	1	2	3	4	5	6	7
Changes in the hospital structure	1	2	3	4	5	6	7

To what extent is your work performance assessed by each of the following factors?

	Not at All						To a great Extent
Specific measures of the quantity of your output	1	2	3	4	5	6	7
Subjective ratings of your attitude by your supervisor	1	2	3	4	5	6	7
Subjective ratings of your work habits by your supervisor	1	2	3	4	5	6	7
Peer review by co-workers	1	2	3	4	5	6	7
Peer review by professional colleagues	1	2	3	4	5	6	7
Your own opinion of your work performance	1	2	3	4	5	6	7

When there is a problem with your work performance, to what extent do each of the following factors help to make you aware of the problem?

	Not at All						To a great Extent
Specific records of the quantity of your work	1	2	3	4	5	6	7
Observation of your work behavior by a supervisor	1	2	3	4	5	6	7
Observation of your work behavior by co-workers	1	2	3	4	5	6	7
Observation of your work behavior by professional colleagues	1	2	3	4	5	6	7
Your own observations of your work performance	1	2	3	4	5	6	7

To what extent does each of the following factors help you to know when you have done a good job?

	Not at All						To a great Extent
Specific records of the quantity of your work	1	2	3	4	5	6	7
Observation of your work behavior by a supervisor	1	2	3	4	5	6	7
Observation of your work behavior by co-workers	1	2	3	4	5	6	7
Observation of your work behavior by professional colleagues	1	2	3	4	5	6	7
Your own observations of your work performance	1	2	3	4	5	6	7

To what extent do each of the following factors influence or establish the standards by which your performance is judged?

	Not at All						To a great Extent
Written standards for the quantity of your output	1	2	3	4	5	6	7
Written standards for the quality of your output	1	2	3	4	5	6	7
Unwritten standards communicated by co-workers	1	2	3	4	5	6	7
Written standards of a professional group of which you are a member	1	2	3	4	5	6	7
Unwritten standards of a professional group of which you are a member	1	2	3	4	5	6	7
Your own standards concerning the quality or quantity of your work	1	2	3	4	5	6	7
To what extent is your immediate supervisor able to accurately assess your work performance?	1	2	3	4	5	6	7
To what extent are co-workers in your department able to accurately assess your work performance?	1	2	3	4	5	6	7
To what extent are you able to accurately assess your own work performance?	1	2	3	4	5	6	7

Think of a critical incident or change in the organization's environment that would require you to make a decision. In thinking about this factor:

	Never						Always
How often do you feel you have the information you need to understand how this factor will change in the future?	1	2	3	4	5	6	7
How often do you believe that the information you have about this factor is adequate for decision-making?	1	2	3	4	5	6	7
How often is it difficult for you to get the necessary information about this factor for decision-making?	1	2	3	4	5	6	7
How often is it difficult to obtain additional information about this factor when you need it for decision-making?	1	2	3	4	5	6	7
How often is it difficult for you to predict which environmental factors and components will be important considerations in future decisions?	1	2	3	4	5	6	7
How often do you feel that you are able to predict how this factor will affect decisions made by management?	1	2	3	4	5	6	7
How often can you predict the impact that this change will have on the success or failure of your work?	1	2	3	4	5	6	7
	Unsure						Sure
How sure are you that this change will affect the success or failure of your work?	1	2	3	4	5	6	7
Before a decision is made, how sure are you of the affect this change will have on the decision?	1	2	3	4	5	6	7

Once you are aware of a critical change in the organization's environment, what length of time is typically required before you have feedback or information that will tell you how it will affect your work? (circle the appropriate response)

1 day 2 days 1 week 1 month 6 months 1 year 2 + years

	Strongly Disagree			Neither			Strongly Agree
When weighing the various alternatives for responding to change, it is difficult to decide which of these alternatives is likely to be most effective in the long run.	1	2	3	4	5	6	7
I cannot accurately assess the relative effectiveness of various alternatives because there are so many unknowns that can influence the effectiveness of each alternative.	1	2	3	4	5	6	7
In the face of these changes, to some extent I will just have to guess which strategy will produce the most desirable outcome for my department.	1	2	3	4	5	6	7
It is difficult to determine exactly what alternatives are available for responding to these changes.	1	2	3	4	5	6	7

	Less than One month						More than One year
How long do you think it would take for an inexperienced person to learn the basics necessary to handling your job?	1	2	3	4	5	6	7

Think of the time that you spend working directly with clients or patients.

	Never						Always
To what extent are the decisions you make in working with clients or patients dissimilar from one day to the next?	1	2	3	4	5	6	7
Think of all the kinds of events which affect your work with clients or patients. How often would you say you are able to anticipate and predict the nature of those events?	1	2	3	4	5	6	7
Many jobs require the use of searching procedures of one kind or another in solving client or patient problems. To what extent are the searching procedures you use dissimilar from one day to the next?	1	2	3	4	5	6	7
How often do you meet clients or patients with problems you have never encountered before?	1	2	3	4	5	6	7

	Strongly Disagree			Neither			Strongly Agree
The administration of this hospital is sincere in its attempt to meet the workers' point of view	1	2	3	4	5	6	7
I feel confident that the hospital will always try to treat me fairly	1	2	3	4	5	6	7
Our hospital's administration would be quite prepared to gain advantage by deceiving the workers	1	2	3	4	5	6	7
Our hospital has a poor future unless it can attract better administrators	1	2	3	4	5	6	7
The administration can be trusted to make sensible decisions for the hospital's future	1	2	3	4	5	6	7
The administration seems to do an efficient job	1	2	3	4	5	6	7
The time that I spend working with clients or patients is the most challenging part of my job	1	2	3	4	5	6	7
Responding to the needs of clients or patients is very demanding	1	2	3	4	5	6	7
I seldom find my work with clients or patients to be challenging	1	2	3	4	5	6	7
My interactions with clients or patients often become intense	1	2	3	4	5	6	7
I rarely find working with clients or patients to be difficult	1	2	3	4	5	6	7

What percentage of your work time do you spend in contact with clients or patients? _____%

To what extent does your knowledge about how to perform your job come from each of the following sources?

	To a Small Extent						To a Great Extent
Superiors	1	2	3	4	5	6	7
Co-workers who are not members of your profession	1	2	3	4	5	6	7
Co-workers who are members of your profession	1	2	3	4	5	6	7
Members of your profession outside of the workplace	1	2	3	4	5	6	7

To what extent do you rely on each of the following groups for assistance when you have a job-related question or problem?

	To a Small Extent						To a Great Extent
Superiors	1	2	3	4	5	6	7
Co-workers who are not members of your profession	1	2	3	4	5	6	7
Co-workers who are members of your profession	1	2	3	4	5	6	7
Members of your profession outside of the workplace	1	2	3	4	5	6	7

To what extent do you model your own work behavior after that of the following groups?

	To a Small Extent						To a Great Extent
Superiors	1	2	3	4	5	6	7
Co-workers who are not members of your profession	1	2	3	4	5	6	7
Co-workers who are members of your profession	1	2	3	4	5	6	7
Members of your profession outside of the workplace	1	2	3	4	5	6	7

In the left-hand column, please indicate how important each of the following items is to you. In the right-hand column, indicate how important you feel that item is to your supervisor. Use the following scale for your ratings:

1 = not important at all
2 = very little importance
3 = somewhat important
4 = very important
5 = extremely important

Importance to You						Importance to Your Supervisor				
1	2	3	4	5	Providing a quality service	1	2	3	4	5
1	2	3	4	5	Building relationships within this department	1	2	3	4	5
1	2	3	4	5	Getting as much work done as possible	1	2	3	4	5
1	2	3	4	5	Accomplishing work in a safe manner	1	2	3	4	5
1	2	3	4	5	Maintaining high morale in this department	1	2	3	4	5
1	2	3	4	5	Working together with department members	1	2	3	4	5

Importance to You						Importance to Your Supervisor				
1	2	3	4	5	Promoting open and honest communication	1	2	3	4	5
1	2	3	4	5	Developing individual skills and abilities	1	2	3	4	5
1	2	3	4	5	Building relationships with other departments	1	2	3	4	5
1	2	3	4	5	Increasing the output of the department	1	2	3	4	5
1	2	3	4	5	Increasing the size of the department	1	2	3	4	5
1	2	3	4	5	Finding better ways to accomplish tasks	1	2	3	4	5

Listed below are a series of statements that represent possible feelings that individuals might have about the company or organization for which they work. With respect to your own feelings about Childrens Medical Center, please indicate the degree of your agreement or disagreement with each statement.

	Strongly Disagree			Neither			Strongly Agree
I am willing to put in a great deal of effort beyond that normally expected in order to help this organization to be successful	1	2	3	4	5	6	7
I talk up this organization to my friends as a great organization to work for	1	2	3	4	5	6	7
I feel very little loyalty to this organization	1	2	3	4	5	6	7
I would accept almost any type of job assignment in order to keep working for this organization	1	2	3	4	5	6	7
I find that my values and the organization's values are very similar	1	2	3	4	5	6	7
I am proud to tell others that I am part of this organization	1	2	3	4	5	6	7
I could just as well be working for a different organization as long as the type of work was similar	1	2	3	4	5	6	7
This organization really inspires the very best in me in the way of job performance	1	2	3	4	5	6	7
It would take very little change in my present circumstances to cause me to leave this organization	1	2	3	4	5	6	7
I am extremely glad that I chose this organization to work for over those I was considering at the time I joined	1	2	3	4	5	6	7
There's not too much to be gained by sticking with this organization indefinitely	1	2	3	4	5	6	7
Often, I find it difficult to agree with this organization's policies on important matters relating to its employees	1	2	3	4	5	6	7
I really care about the fate of this organization	1	2	3	4	5	6	7
For me, this is the best of all possible organizations for which to work	1	2	3	4	5	6	7
Deciding to work for this organization was a definite mistake on my part	1	2	3	4	5	6	7

	YES	NO
In some organizations, records are kept for each employee which show his or her output--for example, number of tests processed, number of patients served, etc. Does your immediate supervisor keep such records of your individual output?	( )	( )

BIOGRAPHICAL INFORMATION

The following information is needed for making statistical comparisons. Please answer each question to the best of your ability. **THIS INFORMATION IS COMPLETELY CONFIDENTIAL,** and will only be used in aggregate form, not for individual comparisons.

Approximately how many years of professional training have you received? ....._____

Approximately how long have you worked:

in your profession? ....._____
at this employer? ....._____
in your current department? ....._____
in your present position? ....._____

How many different positions have you held with this organization?....._____

Please indicate your present work status:

( )[1] Part-time employee: Approximate hours/week?....._____
( )[2] Full-time employee
( )[3] Volunteer: Approximate hours/week? ....._____
( )[4] Other (Please describe) _____

Which of the following best describes your work shift?

( )[1] Day Shift
( )[2] Evening Shift
( )[3] Night Shift
( )[4] Rotation
( )[5] Does not apply

From the following list, please indicate your primary department/cost center.

( )[1] Accounting
( )[2] Administration
( )[3] Admissions/Intake
( )[4] Adolescent Unit
( )[5] AHN
( )[6] Art Therapy
( )[7] Building Operations
( )[8] Business Office
( )[9] Central Supplies
( )[10] Chapman Research
( )[11] Chemical Dependency
( )[12] Child Care Center
( )[13] Childrens North
( )[14] Childrens South
( )[15] Clinical Lab
( )[16] Contributions
( )[17] Day Treatment
( )[18] Dietary
( )[19] Directions
( )[20] E.C.D. Psych
( )[21] Early Day Treatment
( )[22] Electrophysiology
( )[23] Employee Benefits
( )[24] Employee Health
( )[25] Genetics Lab
( )[26] Group Homes
( )[27] Hotel Operations
( )[28] Human Resources
( )[29] Laundry
( )[30] Library
( )[31] Link Project
( )[32] Management Systems
( )[33] Marketing
( )[34] Medical Education
( )[35] Medical Records
( )[36] NCS
( )[37] Nursing Administration
( )[38] Occupational Therapy
( )[39] Orthoptics
( )[40] Outpatient Pediatrics
( )[41] Outpatient Psych
( )[42] Pediatric Inpatient unit
( )[43] Pharmacy
( )[44] Physical Rehab
( )[45] Psych Testing Center
( )[46] Psychology
( )[47] Purchasing
( )[48] Quality Assurance
( )[49] Radiology
( )[50] Risk Management
( )[51] Social Services
( )[52] Special Care
( )[53] Special Education
( )[54] Speech/Audiology
( )[55] TCYH
( )[56] Vocational Training Ctr
( )[57] Volunteer
( )[58] Westbank
( )[59] Word Processing

What is your job title? ....._____

Who is your primary supervior? ....._____

Please indicate the highest level of education that you have received:

( )[1] Some high school	( )[5] Bachelor's degree
( )[2] High school graduate	( )[6] Master's Degree
( )[3] Some college, no degree	( )[7] M.D. or D.O.
( )[4] Associate degree	( )[8] Ph.D.

What is your current age? ....._____

What is your sex? ( )[1] Male ( )[2] Female

What percentage of your total household income is provided by your employment in this position? (If working as a volunteer, please put a zero.) ....._____%

APPENDIX C

HUMAN RESOURCES SURVEY

	Exempt? Y / N	Number of qualified applicants per opening (average)	Rate of Change in Supply of Qualified Applicants							Rate of Change in Compensation of New Hires						
			Decreasing Rapidly			Remaining Constant			Increasing Rapidly	Decreasing Rapidly			Remaining Constant			Increasing Rapidly
Administrative Coordinator	Y N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
AVP Marketing & Development	Y N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Baker	Y N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Case Manager	Y N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Child Care Specialist II	Y N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Child Care Specialist III	Y N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Clerk - Medical Records	Y N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Clinical Social Worker	Y N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Clinical Social Worker	Y N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Compensation/Benefits Manager	Y N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Coordinator - Community Relations	Y N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Cytogenetic Technologist	Y N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Department Clerk	Y N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Director - Medical Records	Y N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Director of Development	Y N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Employment Coordinator	Y N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7

	Exempt? Y / N		Number of qualified applicants per opening (average)	Rate of Change in Supply of Qualified Applicants							Rate of Change in Compensation of New Hires						
				Decreasing Rapidly			Remaining Constant			Increasing Rapidly	Decreasing Rapidly			Remaining Constant			Increasing Rapidly
Genetics Technician	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Health Data Analyst	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Independent Living Specialist	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Neurology Nurse Clinician	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Office Coordinator	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Post-doctoral Research Associate	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Primary Adjunctive Therapist	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Primary Therapist	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Program Director - Group Homes	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Project Coordinator	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Psychoanalyst	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Res III	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Research Director	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Secretary	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Senior Clinician - ECD Psych	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Senior Cytogenetic Technologist	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7

	Exempt? Y / N		Number of qualified applicants per opening (average)	Rate of Change in Supply of Qualified Applicants							Rate of Change in Compensation of New Hires						
				Decreasing Rapidly			Remaining Constant			Increasing Rapidly	Decreasing Rapidly			Remaining Constant			Increasing Rapidly
Senior Secretary	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Skyroom Coordinator	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Speech/Language Psychologist	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Staff Audiologist	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Staff Psychologist	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Supervisor - Electrophysiology	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Switchboard Operator	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Technician - Electrophysiology	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Therapist - EDT	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Therapist - TCYH	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Triage Specialist	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Unit Manager - Speech/Language Psychology	Y	N	_____	1	2	3	4	5	6	7	1	2	3	4	5	6	7

MISCELLANEOUS INFORMATION NEEDED

Size

How many full-time equivalent (FTE) employees does ___ currently employ? _____

How many hospital beds does ___ currently have? _____

What is the average inpatient census for the past three months? _____

Munificence

One important variable in this study is munificence, which relates to the availability of resources. One accepted measure of munificence is the rate of change in revenues for an organization. Please note that I do not need actual revenue figures, only the percent change in revenues from one time period to the next.

Percent change in revenues from
first half of 1991 to first half of 1992? _____

Percent change in revenues from 1990 to 1991? _____

Percent change in revenues from 1989 to 1990? _____

Departmental Size

Please list the number of full-time equivalent (FTE) employees for each of the following departments/cost centers:

Administration	_____	Human Resources	_____
Admissions/Intake	_____	Link Project	_____
Adolescent Unit	_____	Marketing	_____
AHN	_____	Medical Records	_____
Business Office	_____	Nursing Administration	_____
Chapman Research	_____	Outpatient Pediatrics	_____
Chemical Dependence	_____	Outpatient Psychology	_____
Child Care Center	_____	Pediatric Inpatient Unit	_____
Childrens North	_____	Psych Testing Center	_____
Childrens South	_____	Psychology	_____
Day Treatment	_____	Purchasing	_____
Dietary	_____	Risk Management	_____
E.C.D. Psych	_____	Social Sciences	_____
Early Day Treatment	_____	Speech/Audiology	_____
Electrophysiology	_____	TCYH	_____
Genetics Lab	_____	Volunteer	_____
Group Homes	_____	Westbank	_____
Hotel Operations	_____		

APPENDIX D

PERFORMANCE SURVEY

DEPARTMENT PERFORMANCE SURVEY

Please rate each of the listed departments/cost centers on each of the performance criteria listed. Your responses will be combined with those of other top-level management personnel to form an average performance rating for each of the listed departments. For this data to be worthwhile, it is important that you answer **all** questions for **all** listed departments. Please mail this survey in the enclosed postage-paid envelope. Thank you for your cooperation and assistance.

[2] *To what extent does the **this department**:*

	To a Small Extent						To a great Extent
Meet its objectives?	1	2	3	4	5	6	7
Contribute to the organization?	1	2	3	4	5	6	7
Utilize resources effectively in meeting organizational goals?	1	2	3	4	5	6	7
Interact effectively with other areas of the organization?	1	2	3	4	5	6	7
Reach its potential?	1	2	3	4	5	6	7
	Very Poor						Superior
How would you rate the overall performance of this department?	1	2	3	4	5	6	7

Note: these items were repeated for each department

VITA

Robert H. Roller

Candidate for the Degree of

Doctor of Philosophy

Thesis: MANAGEMENT AND SUPERVISORY CONTROL: CONTEXTUAL ANTECEDENTS AND CONSEQUENCES FOR PERFORMANCE, SATISFACTION, AND COMMITMENT

Major Field: Business Administration

Biographical:

Personal Data: Born in Columbus, Ohio, May 13, 1957, the son of Robert F. and Emmalou N. Roller.

Education: Graduated from Whetstone High School, Columbus, Ohio, in June 1975; received Bachelor of Science degree in Business Administration and Theology from Oral Roberts University in May, 1979; received Master of Business Administration degree in Finance from Oral Roberts University in May, 1986; completed requirements for the Doctor of Philosophy degree at Oklahoma State University in December, 1995.

Professional Experience: Instructor of Finance at Oral Roberts University, August 1986 to May 1991; Assistant Professor of Management at Oral Roberts University, August 1991 to May 1992; Assistant Professor of Strategy and Entrepreneurship at Kennesaw State College, September 1992 to present.

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
FOR HUMAN SUBJECTS RESEARCH

Proposal Title: MANAGEMENT AND SUPERVISORY CONTROL: CONTEXUAL ANTECEDENTS AND CONSEQUENCES FOR PERFORMANCE, SATISFACTION, AND COMMITTMENT

Principal Investigator: Dr. Margaret White/Robert Roller

Date: July 7, 1992 IRB # BU-93-002

This application has been reviewed by the IRB and

Processed as: Exempt [XX] Expedite [ ] Full Board Review [ ]

Renewal or Continuation [ ]

Approval Status Recommended by Reviewer(s):

Approved [XX] Deferred for Revision [ ]

Approved with Provision [ ] Disapproved [ ]

Approval status subject to review by full Institutional Review Board at next meeting, 2nd and 4th Thursday of each month.

Comments, Modifications/Conditions for Approval or Reason for Deferral or Disapproval:

Signature: Marcia K. Tilley Date: July 10, 1992

Chair of Institutional Review Board