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THE IMPACT OF MARKET STRUCTURE AND ENVIRONMENTAL  
CHANGE ON JOB AUTONOMY: AN INTRA-ORGANIZATIONAL  
ANALYSIS

*City University of New York*

PH.D.

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THE IMPACT OF MARKET STRUCTURE AND  
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AN INTRA-ORGANIZATIONAL ANALYSIS

by

LAWRENCE GAIL BRIDWELL

A dissertation submitted to the  
Graduate Faculty in Business in  
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The City University of New York

1980

This manuscript has been read and accepted for the Graduate Faculty in Business in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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## Abstract

### THE IMPACT OF MARKET STRUCTURE AND ENVIRONMENTAL CHANGE ON JOB AUTONOMY: AN INTRA-ORGANIZATIONAL ANALYSIS

by

Lawrence G. Bridwell

Adviser: Professor Mahmoud A. Wahba

Within one large industrial corporation, the interaction among several environmental and organizational variables was examined. The variables included market structure (industrial concentration), rate of sales growth, technology, bureaucratic attitudes, job satisfaction, and job autonomy. Questionnaire responses were obtained from 402 employees encompassing four divisions in rapidly growing industries, and four divisions in stable growth industries. The sample was subdivided into professional and non-professional categories, and analyzed by the business functions of manufacturing, engineering, marketing and accounting.

This study recommends that contingency theory be revised to include job autonomy as a major theoretical and empirical variable. The use of the terms mechanistic and organic, which emphasizes either high or low overall organizational structure, is too simplistic and does not adequately deal with the paradox of high structuring of

activities and high job autonomy which can exist in rapidly growing industries with advanced technology. This study proposes that the mechanistic/organic dichotomy be expanded into a four category system by simultaneously using organizational structuring of activities and employee job autonomy as classification criteria. The four recommended categories, classical/administrative (high structuring of activities, low job autonomy), neo-scientific (high structure, high job autonomy), organic (low structure, high job autonomy), and entrepreneurial (low structure, low job autonomy) have several theoretical and empirical advantages, particularly when integrated with environmental analysis.

Industrial concentration and the rate of sales growth were used as the basis for analyzing environments. A crucial environmental factor appears to be whether a rapidly growing market is oligopolistic or very competitive. Apparently highly structured firms avoid risky situations and instead prefer more predictable markets where they have, or can systematically develop, a strong market position. The organizational implication is that organic or entrepreneurial organizations will be prevalent in highly competitive turbulent industries, whereas neo-scientific organizations will seek out favorable rapid growth situations that have the potential for high market share. In analyzing how neo-scientific companies adapt themselves to rapid growth markets, job autonomy is a very important factor. The evidence in this study showed that manufacturing, engineering and

and marketing professionals in rapidly growing industries had significantly greater employee job autonomy than their counterparts in stable growth markets, even though structuring of activities was higher in the rapidly growing divisions. By using point bi-serial correlations, this study established a clear link between rapid sales growth and job autonomy for those employees most closely associated with providing products to the customer. The rate of sales growth had minimal impact on other employees who had less decision-making involvement with the external environment. Thus, the results appear to offer some support for J.D. Thompson's postulation that the managerial level will vary its structure depending on the environment, but that the technical core of an organization will be relatively shielded from environmental effects.

The emergence within this study of job autonomy as a crucial theoretical and empirical variable strongly suggests the need for more job autonomy research with an emphasis on both extensive methodological refinement and empirical analysis of the specific interaction among types of jobs, bureaucratic attitudes, job satisfaction, and job autonomy.

## ACKNOWLEDGEMENTS

This dissertation has been a major part of my Ph.D. education. As such, it has encompassed what I consider to be the best elements of the Baruch College doctoral faculty--the teaching of the linkage between theoretical analysis and empirical research. During the several revisions of the research design and text of this dissertation I have had the good fortune to have the advice, counsel, and insight of several outstanding professors. They were of great assistance during my many struggles to formulate the most appropriate research methodology to further understand organizational phenomena. For me, this process has been an invaluable learning experience.

I would like to acknowledge a few of the many contributions that have helped me during my years in the Ph.D. Program in Business.

My first management class was with Professor Robert House, who emphasized the criteria for evaluating social science theory. As a challenging instructor, and as my first doctoral adviser, he was the initial spark who introduced me to contemporary organizational theory.

Dean Sidney I. Lirtzman continued my management theory education with two very stimulating courses. His relentless drive to understand the essence of various management

theories was a brilliant demonstration of the intellectual process. As a student, I marveled at his teaching skill, and I often had to remind myself not to let my classroom enjoyment detract from my learning the important content of the course material.

Professor Mahmoud A. Wahba was my instructor in research methodology. He has been of enormous assistance in teaching me what the research process is and how to relate it to theory development. Professor Wahba's wide-ranging teaching methods, both inside and outside the classroom, were outstanding, because they brought out the multifaceted nature of empirical research. He has also served as my doctoral adviser, and his generous nature has been invaluable in assisting me to complete the Ph.D. program.

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A crucial part of this dissertation was the company that allowed me to conduct the necessary research. They

were very cooperative in providing access to employees in eight divisions, and in answering a variety of questions.

I would also like to thank Mrs. Margaret Martin who has not only typed this manuscript, but who has also cheerfully assisted me with the many formal requirements of a dissertation submission.

Many individuals have contributed to this dissertation; however, in accordance with the usual custom, I take full responsibility for the written results.

Lawrence Gail Bridwell

May 1980

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CHAPTER I  
INTRODUCTION

During the last two decades, the organizational literature has paid increasing attention to the impact of the environment on organizations. This area of organizational behavior has been referred to as contingency theory, because it emphasizes that the internal structure of an organization should be contingent on the characteristics of the external environment. The two main postulates of contingency theory can be summarized as follows:

1. If the external environment is stable, then the organization should be highly structured.
2. If the external environment is dynamic, then the organization should be loosely structured.

The theory thus revolves around the contingent link between two major variables--the environment and organizational structure. Since both these variables are broad topics, it is understandable that previous research in contingency theory has largely discussed the environment and organizational structure in general terms. However, general discussion can only be a departure point, because the effect of the environment on specific parts of an organization can vary considerably. For example, a rapidly

changing environment may have a strong impact on some functions, such as marketing, but possibly minimum impact on other organizational activities such as clerical work." More detailed study of the impact of the environment on specific parts of an organization is desirable in order to improve the precision of contingency theory.

As a framework for gathering empirical data, this dissertation will use the concept of construct abduction as articulated by Willer and Webster (1970). They begin their discussion by lamenting that because much of the research in the social sciences can be characterized as "non-cumulative empiricism," it is difficult to integrate the results from the many studies within the social science literature into a solid body of well established theory. The non-cumulative nature of previous empirical research means that noble integrative efforts, however brilliant, are merely conjectural, because a strong cumulative research base simply does not exist and, therefore, it is not possible to formulate precise theoretical relationships with a high degree of empirical confidence.

To improve social science development, Willer and Webster advocate selecting key theoretical constructs and conducting an elaborate research process to fully define their properties and relationships. In their discussion, Willer and Webster make a distinction between observables and constructs. Observables are empirical

events which can be verified by sensory activities, whereas constructs are not directly observable but do have abstract properties which are valuable in formulating theories. The example used to illustrate this distinction is the common reference to occupational differences in the sociological literature. If a sociologist were to study jury behavior in the United States, he might notice that government employees defer to business men, and conclude that this was due to occupational differences. Another sociologist might conduct a similar study in West Germany and notice the opposite--that business men defer to government employees and also conclude that this was due to occupational differences. From the two hypothetical studies just mentioned, it can be seen that focusing on the observable of job occupation can lead to sociologists making contradictory statements about differences in jury behavior between business men and government employees.

Willer and Webster would recommend that instead of discussing variations in occupation as causing differences in behavior, the correct theoretical formulation would be to develop an abstract concept that would transcend variations in specific cultures or periods of time. In the example cited above, the construct, status characteristic, would enable a theorist to say that people with lesser status will tend to defer to people of higher status. By using this kind of theoretical abstraction,

a sociologist can use a wide range of observables to determine the degree of status, including occupation, sex, age, and educational level. The variations in these terms could be different for specific cultures or time periods. However, the underlying construct, status characteristic, could still be validated.

Construct abduction, the research process necessary to move from observables to constructs, is described by Willer and Webster as "the progressive development and refining of a concept, beginning at the stage of an observable, and ending with a well-defined, abstract theoretical construct which is embedded in theoretical assertions," p. 754. The research process necessary to accomplish this is extensive, consisting of three phases.

The first phase is to formulate assertions based on either intuition or empirical observations. The second phase is two-fold. One task is to achieve more abstraction that will make the concepts more powerful theoretically. An example of this is the previously mentioned discussion of moving from the observable, occupation, to the construct, diffuse status characteristic. The other task of the second phase is to achieve more theoretical precision by conducting appropriate research that will

1. achieve better clarity in conceptual definitions,
2. omit or include specific kinds of phenomena when making theoretical statements,

3. extend the scope of assertions to include new types of situation,
4. integrate theoretical propositions from other research, and
5. confirm or deny alternative explanations for various situations.

The purpose of the second phase of abductive research is to provide an empirical check of theoretical formulations and to prevent leaps from specific data to abstract statements which might lead to untrue predictions.

The theoretical concepts of environment and organizational structure are now in the second phase of construct abduction because they require additional refinement. In order to contribute to the development of these two concepts, this dissertation will study two areas of contingency theory not previously examined in a systematic manner. The first area to be studied is market structure. By using industrial concentration measurements as a research tool, this dissertation seeks to determine if oligopolistic markets have different effects on the internal organization of a firm in comparison to more competitive markets. The second area to be studied is the intra-organizational impact of the environment, i.e., how does the environment affect not just the organization as a whole, but also individual functions such as manufacturing, engineering, marketing, and accounting, both at the managerial and the non-managerial level.

The rationale for studying these two areas is discussed in more detail in the next chapter, "Review of the Literature," a survey of organizational studies available in early 1976. Studies published since then are analyzed in later chapters in terms of their relevance to the research of this study which was conducted in late 1976 and early 1977.

## CHAPTER II

### REVIEW OF THE LITERATURE

#### Rate of Change in the External Environment

During the early 1960's, two studies (Burns and Stalker, 1961; and Woodward, 1965) postulated that stable, slow changing environments tend to lead to mechanistic organizations, and that dynamic, rapidly changing environments tend to lead to organic organizations. The term, mechanistic, was used to describe organizations characterized by specialized, well defined roles which carefully control employee behavior. The term, organic, was used to describe organizations that are the opposite--loosely structured with minimum reliance on formal job definitions, rules, or procedures. This important dichotomy between mechanistic and organic organizations stimulated Lawrence and Lorsch (1967) to examine three industries with wide variations in market conditions. After gathering a considerable amount of evidence, Lawrence and Lorsch recommended that dynamic businesses be managed differently in comparison to stable businesses.

These and other studies which have used the degree of environmental change as an independent variable are

summarized in Table 1. An analysis of these studies indicates two areas for additional research. One area is to use objective instruments to measure environmental change, and the second area is to examine more closely the intra-organizational effects of the environment.

---

Insert Table 1 here

---

In four of the eight studies in Table 1, the author's judgement was the basis for distinguishing between stable and dynamic environments (Dill, 1958; Burns and Stalker, 1961; Woodward, 1965; and Ellis and Child, 1973). This method of classification can be criticized because authoritative opinions based on uncontrolled observations are subject to errors of interpretation and selectivity, particularly if the observations are summarized a considerable length of time after their occurrence (Filley and House, 1969). Three other studies (Lawrence and Lorsch, 1967; Nielsen, 1974; and Lorsch and Morse, 1974) relied on a three item questionnaire which has subsequently been methodologically criticized by Tosi (1973). The eighth study (Duncan, 1972) used a perceptual questionnaire which has yet to be validated with objective data. Objective data which systematically measures environmental change would not have the subjectivity inherent in perceptual judgements, and would thus make a contribution to the contingency theory literature.

Table I

## EMPIRICAL STUDIES OF ENVIRONMENTAL CHANGE (STABLE VS. DYNAMIC ENVIRONMENTS)

Study	Environmental change as an explicitly measured independent variable	Method of measuring degree of environmental change	Dependent variable	Method of evaluating dependent variable	Detailed analysis of differences in environmental change and the effect on organizational functions, e.g., manufacturing, research, marketing and accounting	Type of industry
Dill (1958)	No	Author's judgment based on general data and observation	Managerial autonomy	Author's judgment based on observations and interviews	No	Manufacturing
Burns and Stalker (1961)	No	Author's judgment	Management style mechanistic/organic	Author's judgment based on interviews	No	Manufacturing
Woodward (1965)	No	Author's judgment	Management style mechanistic/organic	Author's judgment based on observations and interviews	No	Manufacturing
Lawrence and Lorsch (1967)	Yes	Questionnaire and general economic data	Several including formality of structure	Interviews and empirical data	No	Manufacturing, and processed food
Duncan (1972)	Yes	Interview and questionnaire, then division of sample at median into stable/dynamic categories	Perceived uncertainty	Interview and questionnaire	No	Manufacturing and research organizations

Table I (continued)

Study	Environmental change as an explicitly measured independent variable	Method of measuring degree of environmental change	Dependent variable	Method of evaluating dependent variable	Detailed analysis of differences in environmental change and the effect on organizational functions, e.g., manufacturing, research, marketing and accounting	Type of industry
Lorsch and Morse (1974)	Yes	Questionnaire and author's judgment	Several including formality of structure	Interviews and empirical data	No	Manufacturing and research
Child and Ellis (1973)	Yes	Author's judgment	Several including formality of structure	Questionnaires	No	Manufacturing and service industries
Nielsen (1974)	Yes	Questionnaire and author's judgment	Several including formality of structure	Interviews and empirical data	Yes	Manufacturing

A second area for empirical research is suggested from the fact that, with one exception, the unit of analysis in Table 1 has been limited to either entire firms or autonomous decision-making units. Very little detailed data is available which systematically investigates the intra-organizational impact of environmental change on the specific functions of manufacturing, research, marketing, and accounting. Nielsen (1974) did compare several functions between two small firms in contrasting environments and found little intra-organizational difference between the two firms. However, the generality of this finding is subject to several limitations:

1. The stable environment firm had recently made several changes in anticipation of expansion which were reflected in its scores on Lawrence and Lorsch's environmental uncertainty instrument. Both the marketing and research departments of the stable environment firm had higher uncertainty scores than their counterparts in the dynamic environment firm. This data empirically casts doubt on the author's perceptual judgement in classifying one firm as dynamic and the other as stable.

2. In discussing the production departments of the two firms, Nielsen commented that although the structural scores were similar, the dynamic environment firm had one unit which was evaluated in terms of broad criteria, and which spent most of its time on uncertain

aspects of the production department tasks. This indicates at least some difference in structure due to uncertainty.

3. Nielsen stressed the importance of size as an independent variable. He concluded that small firm environments lead to extensive employee interaction which outweighs structural factors.

Some of the studies in Table 1 have compared manufacturing units with research units but, invariably, manufacturing activities have been considered stable, whereas research activities have been considered dynamic. What is needed is a systematic analysis of manufacturing, research, marketing, and accounting in both stable and dynamic environments. Child and Ellis (1973) analyzed questionnaire responses by senior management in several British firms, and stressed the importance of studying how "industries and specialized areas of work differ systematically." They emphasized:

....The advantages of moving away from a conception of management as a homogeneous occupational group, and instead, of seeking to identify variations in managerial roles and to locate them meaningfully in their situational contexts....Problems of managerial selection and development cannot satisfactorily be approached from a universalistic frame of reference which does not have regard to the particular context (pp. 247-248).

Intra-organizational research would contribute to organizational theory by examining specific areas of work and by extending the unit of analysis in contingency theory from entire organizations to particular business functions.

Intra-organizational research is also important in the context of the systems approach, which distinguishes those parts of the organization that interact with the environment from other parts that are primarily internal to the organization. It is conceivable that environmental change would have its strongest impact on an externally oriented function such as marketing and its least impact on an internally controlled function, such as the manufacturing assembly line. Thompson (1967) has used the term, technical core, to distinguish that part of the organization shielded from the environment by the managerial level. According to Thompson, management serves as a technical core buffer and regulates the transactions between the organization and the environment. At the technical core level, organizations will tend to stress controls and to be mechanistic; but, at the managerial level, organizations will be more flexibly structured to deal with a changing environment.

This degree of organization flexibility is sometimes evaluated in terms of formality of structure. Formality of structure has been discussed in various ways (Inkson et al., 1970; Lawrence and Lorsch, 1967), including span of control, information bulletins, performance reports, bureaucratic procedures and other factors. The two bi-polar terms, mechanistic and organic, have been often used to describe the extremes in formality of structure. Selected

quotations from Burns and Stalker (1961) detailing these terms follow:

In mechanistic systems....the technical methods, duties, and powers attached to each functional role are precisely defined....Operations and working behavior are governed by instructions and decisions issued by superiors.

In organic systems....jobs lose much of their formal definition in terms of methods, duties, and powers, which have to be redefined continually by interaction with others participating in a task. Interaction runs laterally as much as vertically. Communication between people of different ranks tends to resemble lateral consultation rather than vertical command (pp. 5-6).

This hypothesized difference in employee autonomy between mechanistic and organic organizations has wide-ranging implications and deserves more empirical study. The categorization of organizations as either mechanistic or organic implies the overriding preeminence of one variable, environmental change, without leaving much room for other moderating influences.

Furthermore, if firms are to be organized in either a mechanistic or organic manner, then, managerial styles are strongly suggested, thereby affecting employee motivation, job satisfaction, and performance. Evidence should be gathered that specifically examines intra-organizational structure. One question that deserves an empirical answer is, should manufacturing activities be mechanistically structured in both stable and dynamic industries? This same type of question also applies to marketing, engineering, and accounting. In studying

these questions, this dissertation will focus on the extent to which a job is specifically defined and controlled by management. We will now examine the theory of market structure and its relevance to organizational theory.

### Market Structure and Industrial Concentration

#### Market Structure

In discussing market structure, Samuelson (1964) has delineated three forms of competition: perfect, imperfect and monopoly. Perfect competition and monopoly are the two extremes with only a few industries or companies qualifying as either; imperfect competition is far more common and is a blend of monopoly and competitive forces which varies from industry to industry. Within this middle area, monopolistic competition and oligopoly are two models that have received wide attention.

Monopolistic competition is said to exist in industries which have many sellers of differentiated products. The monopoly element stems from each product having some unique aspect. These aspects can range from advertising appeal to locational advantage, e.g., being the only product available in the neighborhood. However, the monopoly element, whatever it may be, is vastly diluted by many competitors being able to offer similar products at comparable prices.

Oligopoly is distinguished by a few sellers. One of its characteristics is that each firm within a particular industry will often act only after observing and anticipating the actions of its competitors. Many economists have argued that this conscious consideration of potential competitive responses can develop into administered prices and standard industry practices with each firm being confident of its ability to sell a minimum level of goods. It has also been argued that standard industry practices can work to the disadvantage of the consumer because oligopolistic industries will often develop a de facto set of collaborative policies which (1) maintain high prices to ensure hefty profits, and (2) control to the industry's advantage instead of the customer's the rate of technological change. Galbraith (1967) has further postulated that oligopolistic firms use advertising as a psychological tool to persuade consumers to buy an ever increasing amount of products which they do not always need. This determined effort to expand markets can lead to greater dominance of industry by a few corporations. The result of this is that customers are subject to ever increasing control by powerful oligopolies.

### Industrial Concentration

To minimize the power of oligopolies, anti-trust theorists argue that society should encourage active competition in order to provide customers with several purchasing alternatives. Active competition also helps to prevent a single firm or a small group of companies from controlling the market. To determine how much competition exists within a particular industry, the concept of industrial concentration is often used. Industrial concentration is measured statistically by determining whether the total sales of an industry within a certain geographic area are accounted for by many firms, several firms, a few firms, or one firm.

As shown in the chart below, an industrial concentration continuum can be created with pure competition, monopolistic competition, oligopoly and monopoly being the four major categories.

<u>Industrial Concentration</u>			
Low			High
Pure Competition (Many firms)	Monopolistic Competition (Several firms)	Oligopoly (Few firms)	Monopoly (One firm)

As the pure competition end of the continuum, many sellers exist with no individual company having a large percentage of the total sales. At the monopoly end of the continuum, a customer has essentially no alternative other than one

company. In the middle range of the continuum, monopolistic competition offers the customer at least several possibilities, and oligopoly is characterized by a few sellers having a large share of the market. The more an industry is dominated by one or a few companies, the more it is considered to be industrially concentrated.

If a highly concentrated industry has more power than a less concentrated industry to control a market, one can argue that oligopolistic companies will tend to be mechanistic, because they control their markets and thus can create a predictable environment. In contrast, firms within a fluid, competitive environment are more subject to frequent changes, and may, of necessity, be more organically organized in order to cope with unpredictable events.

Another aspect related to industrial concentration is the concept of environmental certainty as discussed by Lawrence and Lorsch (1967). They postulated that environmental certainty favors mechanistic organizations and that environmental uncertainty favors organic organizations. In evaluating the relative certainty of information within the environment, Lawrence and Lorsch identified six criteria:

1. Clarity of information
  2. Certainty of causal relationships
  3. The ability to predict what competitors will do
  4. The ability to control technological change
  5. The rate of environmental change
  6. Time span of definitive feedback
- (pp. 25-28; 85-92)

Of these criteria, all, except time span of definitive feedback, appear to be directly related to industrial concentration. With respect to the first criteria, it may be easier for a firm with only a few competitors to achieve clarity of information than a firm with many competitors. In the same vein, because the number of variables is smaller, a highly oligopolistic industry may have a higher certainty of causal relationships in comparison to an industry with many competing firms. With respect to the third criteria, companies in oligopolistic industries are better able to predict what competitors will do because they are highly visible and tend to plan their actions well in advance. For example, in large concentrated industries, market testing is common and very visible to competitors. Also, if a competitor introduces a new product improvement, a large research staff can quickly study the technology and make a similar product, thus making it easier to control technological change. Finally, the rate of environmental change may be more easily managed by oligopolistic companies because they often have considerable resources to anticipate and to respond to changing environmental conditions. Although the above is subject to empirical validation, a relationship may exist between the theory of market structure as developed in the economic literature and certainty of information, as discussed by Lawrence and Lorsch within the organizational behavior literature.

Empirical Review of the  
Market Structure Literature

The bulk of economic literature which has discussed the effects of competition has done so in the context of ease of market entry, economic efficiency, amount of technical research, and fair pricing for customers. Very few empirical studies in either the economic or organizational behavior literature have analyzed the specific effects of competition on formality of structure. These few studies are summarized in Table II.

---

Insert Table II here

---

The three studies together are not conclusive. Pfeffer and Leblebici (1973) examined only small companies, and relied solely on the responses of the chief executive which may have had a significant impact on the data. The other two studies used a decentralization measure which is, at best, an indirect measure of the degree to which day to day employee behavior is specifically defined and controlled. Finally, none of the studies were intra-organizational.

The preceding survey of the literature regarding the impact of environment on organizational structure has revealed three areas deserving more study:

1. The impact of market structure and industrial concentration on organizational structure,

Table II

## EMPIRICAL STUDIES ON THE EFFECTS OF COMPETITION ON ORGANIZATIONAL STRUCTURE

Study	Method of measuring degree of competition	Dependent variable	Method of evaluating dependent variable	Detailed analysis of intra-organizational effect	Results
Pfeffer and Leblebici (1973)	Questionnaire completed by chief executive of 38 small United States manufacturing firms	Several including formality of structure	Questionnaire completed by chief executive	No	Mild support for more formalization in competitive environment than non-competitive environment
Neghandhi and Reirann (1972)	Interviews with employees of 30 companies in India and analysis of published materials with emphasis on price competition and alternatives available to customers	Decentralization	Analysis of decision-making patterns (individual job structure was not measured)	No	In competitive environments, decentralized firms were more effective than centralized companies. Inconclusive data in non-competitive environments
Eoseman and Jones (1973)	Analysis of price competition, and alternatives to customers. Sample consisted of 20 Mexican companies	Decentralization	Same as above	No	In competitive environments, decentralized firms were economically more effective. In non-competitive environments, centralized companies were economically more effective

2. The measurement of environmental change by using objective data as opposed to perceptual methods.

3. Extending the analysis of the effect of the environment to an intra-organizational level, i.e., the business functions of manufacturing, engineering, marketing and accounting.

### CHAPTER III

#### THEORETICAL FORMULATION PRIOR TO THE GATHERING OF RESEARCH DATA

As discussed in the previous chapter, one can analyze the external environment from two perspectives: (1) the rate of change, i.e., stable vs. rapidly growing environments, and (2) the degree of industrial concentration. Since both environmental change and industrial concentration have been hypothesized to be of central importance in determining organizational structure, it would be useful to simultaneously study their effect on organizational behavior. This study has combined these factors as independent variables into a two dimensional matrix as shown below:

	<u>Oligopoly</u>	<u>Competition</u>
Stable	High Formality of Structure	???
Dynamic	???	Low Formality of Structure

The dependent variable focuses on one part of the mechanistic/organic description, namely formality of structure; particularly, the degree to which employee behavior is specifically controlled by management.

Based on recent organizational literature (Burns and Stalker, 1961; Woodward, 1965; and Lawrence and Lorsch, 1967), rapidly growing competitive industries can be expected to have organizations with low formality of structure, and stable, oligopolistic industries can be expected to have organizations with high formality of structure. The other two cells in the above matrix are not as clear cut. In the lower left cell, the dynamic aspects of a rapidly growing market should lead to low formality of structure; however, attributes of an oligopolistic industry could lead to high formality of structure. In the upper right cell, a stable market environment should lead to high formality of structure; however, active competition might require low formality of structure so that an organization can be immediately responsive to new situations. To test the effects of both market structure and the rate of environmental change, this study will seek to examine formality of structure in all four cells as shown above. Using the matrix, the following hypotheses have been formulated:

Hypothesis I - Regardless of the rate of environmental change, the competitive nature of industries with low concentration ratios will tend to lead to low formality of structure in all business functions when compared to the corresponding functions in highly concentrated industries.

Hypothesis II - Regardless of the degree of industrial concentration, all functions in rapidly growing business environments will have less formality of structure in comparison to the corresponding functions in stable growth environments.

By simultaneously testing for the effect of market structure and the rate of environmental growth, it may be possible to determine whether industrial concentration or environmental growth has more impact on organizational structure.

To examine the extent to which dynamic environments create organic organizations, the following hypothesis seeks to test whether organizations have major functions that are highly mechanistic even within rapidly growing industries:

Hypothesis III - In rapidly growing environments, the externally oriented functions of research and marketing will have significantly less formality of structure than the internally oriented functions of manufacturing and accounting.

Testing of the above hypotheses will make a contribution to the organizational literature as follows:

1. If Hypothesis I is validated, it will empirically substantiate the importance of market structure as a variable affecting organizational behavior.

2. If Hypothesis II or III is validated, it will support and expand the postulation that environmental change has a major impact on organizational structure.

3. If none of the hypotheses are supported, then factors other than environmental forces would perhaps be more relevant, thus casting doubt on the postulated, overriding importance of the environment. For example, if high formality of structure is achieved in all industries, a possible explanation would be organizational size.

### Research Instruments

#### Independent Variables

Industrial Concentration. To determine market structure, concentration ratios based on the four digit U.S. Government Standard Classification (SIC) codes have been used. The SIC concentration ratio is a common device for measuring the degree of industrial concentration and is based on a classification scheme developed by the U.S. Department of Commerce. In reporting data to the government, manufacturing firms use a seven digit SIC code for each product. This code divides American industry into five major categories as indicated by the number of digits in the code (Scherer, 1970). An example of this is shown below:

<u>SIC</u>	<u>Classification</u>	<u>Books</u>
27	Major Industry Group	Printing and Publishing
273	Industry Group	Books
2731	Industry	Books: Publishing and Printing
27311	Product Class	Textbooks
27311-16	Product	College Textbooks: Paper bound

The most widely used grouping is the four digit industry code. The two principal reasons are:

1. The three digit code is often considered to be too broad, whereas the five digit product class is often considered to be too narrow (Boyle, 1972).

2. Data for the 417 four digit industry codes is published every year in the Annual Survey of Manufacturers. More detailed data on a product class (five digit) level is very expensive for the government to analyze and to publish yearly. Therefore, product information is disseminated only every four years in the Census of Manufacturers (Boyle, 1972).

The concentration ratio process begins by combining the total value of domestic shipments (imports are excluded) in a particular SIC industry. Then the market shares of the largest firms are divided into the total sales yielding a per cent ratio accounted for by the largest companies. This is done on a four-firm, eight-firm, twenty-firm and fifty-firm basis. The example below illustrates these ratios:

<u>Four Digit Industry</u>	<u>Four Firm Ratio - %</u>	<u>Eight Firm Ratio - %</u>
Cereal Preparations	88	97
Chewing Gum	86	96
Electric Lamps	91	95
Home Laundry Equipment	78	95
Motor Vehicle and Parts	92	98
Transformers	65	78

Of the 413 SIC industries, 101 are classified as highly concentrated (a four-firm concentration ratio exceeding 50 percent; Scherer, 1970).

Although the concentration ratio can be a useful research tool, it is merely a statistical measure, and does not necessarily indicate the degree of competition. Two qualifications among several deserve mention:

1. The ratios usually overstate the degree of concentration because imports are excluded (Scherer, 1970).

2. The industry groupings which stem from physical production processes may not necessarily reflect market forces or potential product substitution. For example, metal cans, and glass containers, are considered separate industries, although they are very competitive with each other (Scherer, 1970).

If used with care, the SIC concentration ratios can be useful, objective measures of competition. In this study, in accordance with common standards, industries with four-firm ratios of over 50 percent will be considered oligopolistic markets, and much smaller ratios will be used to identify competitive industries.

Stable or Dynamic Environment. The other independent variable, rate of environmental change, can be measured in several ways. SIC data from government sources can provide

1. Rate of sales growth
2. Rate of growth in plant and equipment

expenditures

Data from intra-company sources may provide a breakdown of programmed expenditures into various categories. High expenditures for capacity expansion, new business segments, new products and model changes, would indicate a dynamic environment in comparison to expenditures for cost improvements, maintenance, replacement, and rearrangement. The use of quantitative data to establish whether an industry is stable or dynamic is summarized below:

<u>Criterion</u>	<u>Source of Data</u>	<u>Stable</u>	<u>Dynamic</u>
Sales	Gov't.	Moderate Rate of Growth (Significantly less than 10 percent)	Rapid Rate of Growth (Significantly more than 10 percent)
Plant and Equipment Expenditures	Gov't.	Slow Rate of Growth	Rapid Rate of Growth
Ratio of Plant and Equipment Expenditures to Sales	Gov't.	Low	High
Nature of Programmed Expenditures	Company	Emphasis on Cost Improvements, Replacement and Rearrangement	Emphasis on New Products and Capacity Expansion

### Formality of Structure

To measure formality of structure, three direct instruments have been used:

1. The Work Environment Preference Scale (WEPS) (Gordon, 1970) which measures the bureaucratic orientation of the employee;
2. Five questions from Hage and Aiken (1969) which measure directly the extent to which employees feel their activities are specifically defined and controlled by others; and
3. The abbreviated contextual and structural scale by Inkson et al. (1970) which has been used in many companies. This questionnaire has been validated both over a five year period and against the longer version. Three sections have been used: technology, dependence, and structuring of activities. The structuring of activities section serves as a measure of formality of structure. To control for the effect of the manufacturing process, the technology section will be used to analyze the impact of work flow integration.

The use of three different formality of structure instruments has the benefit of helping to refine the concept of formality of structure in accordance with one of the objectives of construct abduction. Similarities or differences in research results will be helpful in achieving more precision when discussing formality of structure.

To analyze the impact of the environment and formality of structure on job satisfaction, the Job Description Index (JDI) has been used as a research instrument. A priori hypotheses regarding job satisfaction have not been made, but the results will be analyzed in order to provide data for formulating job satisfaction propositions in the context of the environment and formality of structure.

#### Research Sample

Eight manufacturing divisions within one company have been selected based on SIC data that cover the four cells as shown below:

	<u>Oligopoly</u>	<u>Competition</u>
Stable	D E	A B
Dynamic	G H	I J

The products of Division H were not explicitly identified in SIC data; however, company sources confirmed that the rate of sales and profit growth exceeded 15 percent per year, and that the industry was unquestionably oligopolistic. Division H cooperated in the completion of some, but not all, of the research instruments. The employee breakdown by division and business function for those who completed all the requested research instruments is shown below:

<u>Div- sion</u>	<u>Manufac- turing</u>	<u>Engineer- ing</u>	<u>Market- ing</u>	<u>Account- ing</u>	<u>Total</u>
A	14	15	11	19	59
B	19	17	16	16	68
D	20	8	18	17	63
E	16	12	15	17	60
G	13	15	7	14	49
I	8	10	9	9	36
J	<u>20</u>	<u>11</u>	<u>19</u>	<u>17</u>	<u>67</u>
Total	110	88	95	109	402

Completed questionnaires were returned by 87 percent of the employee sample. The data that has been gathered is highly useful for cross-analysis because the sample includes only high performing manufacturing divisions, all with returns on investment exceeding 15 percent, and who use identical intra-company accounting procedures. Further details of the employee sample are shown in Table III.

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Insert Table III here

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The above research design seeks to contribute to the organizational literature by

1. Simultaneously testing two postulated determinants of formality of structure:
  - a. rate of environmental change, and
  - b. industrial concentration;
2. Systematically extending the unit of environmental analysis from the general organizational level to more specific areas of work, i.e., manufacturing, engineering, marketing and accounting;

Table III

## DETAILS OF EMPLOYEE SAMPLE

	<u>Manufacturing</u>	<u>Engineering</u>	<u>Marketing</u>	<u>Accounting</u>	<u>Total</u>
<u>Professionals</u>					
Stable	49	35	43	46	173
Rapidly Growing	27	24	24	27	102
<u>Non-Professionals</u>					
Stable	20	17	17	23	77
Rapidly Growing	14	13	10	13	50
<u>Total</u>					
Stable	69	52	60	69	250
Rapidly Growing	<u>41</u>	<u>37</u>	<u>34</u>	<u>40</u>	<u>152</u>
	110	89	94	109	402

3. Empirically refining the concept of formality of structure by using three instruments; and

4. Extending the scope of contingency theory by studying the impact of the environment and formality of structure on job satisfaction.

## CHAPTER IV

### ANALYSIS OF THE RESEARCH RESULTS IN TERMS OF THE A PRIORI HYPOTHESES

#### Industrial Concentration vs. Environmental Change

The main theoretical thrust of this dissertation is the simultaneous testing of two key environmental variables--industrial concentration and environmental change. To determine the relative importance of both factors, two contrasting hypotheses have been formulated. Hypothesis I focuses on industrial concentration and posits that oligopolistic industries will have higher formality of structure than competitive industries, regardless of environmental change. Hypothesis II focuses on environmental change and posits that stable industries will have higher formality of structure than rapidly growing industries, regardless of market structure. Using SIC criteria as the basis for classification, the research data for these two hypotheses is summarized on Page 36.

The results show that Hypothesis I was not verified and that Hypothesis II was supported for Job Autonomy and Bureaucratic attitudes. The opposite of Hypothesis II was indicated by the Structuring of Activities data. But as will be discussed later, technology appears to be the key

INDUSTRIAL CONCENTRATION VS. ENVIRONMENTAL CHANGE

Formality of structure as measured by:\*

	<u>Job Autonomy (Hage + Aiken)</u>	<u>Bureaucratic Orientation (Gordon)</u>	<u>Structuring of Activities (Inkson et al.)</u>
<u>Industrial Concentration (Hypothesis I)</u>			
Oligopolistic	No (7.00)	No (28.4)	No (30.25)
Competitive	Significant Difference (7.08)	Significant Difference (28.0)	Significant Difference (30.25)
<u>Environmental Change (Hypothesis II)</u>			
Stable	Higher (7.3)	Higher (28.9)	Lower (27.25)
Dynamic	Lower (6.6)	Lower (26.9)	Higher (33.25)

\*For purposes of this analysis, the research data for the four business functions have been grouped together; more detailed analysis by business function will be discussed later.

determinant of this dimension rather than environmental change or industrial concentration. In terms of the contrasting hypotheses, the data indicates that the rate of environmental change has a significant impact on formality of structure, whereas industrial concentration has no impact.

#### Analysis of SIC Industrial Concentration Data

Since no significant differences occurred when examining industrial concentration, the SIC classification data was further analyzed to determine its validity. To this end, division executives were interviewed regarding the degree of competition within their industries. For the two stable oligopolistic divisions, and the two stable competitive divisions, the SIC criteria was confirmed. However, for the four rapidly growing businesses, the SIC criteria was not fully applicable.

The divisions classified in SIC data as being part of highly competitive industries were found to be concentrating on specific market segments that were highly oligopolistic. In fact, in one of the two divisions it appears that concentration on oligopolistic segments was deliberate, because a few years ago management had phased out product lines where its market position was not as strong.<sup>1</sup>

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<sup>1</sup>This is in keeping with industrial planning trends of the last several years whereby many firms have downplayed sheer sales growth and instead have emphasized selective market strategy, i.e., concentration on strong market positions, and avoidance of weak market positions. (See Wall Street Journal, February 3, 1978, p. 1).

The classification of the eight divisions within the research sample can now be viewed from the following two perspectives:

	<u>SIC Basis</u>				<u>SIC Data and Company Information</u>			
	<u>Oligopoly</u>		<u>Competitive</u>		<u>Oligopoly</u>		<u>Competitive</u>	
Stable	D	E	A	B	D	E	A	B
Dynamic	G	H	I	J	G	H	I	J

Divisions I and J which, on the basis of SIC data, were considered to be in competitive markets, can now be classified as competing in oligopolistic markets. Although the literature had indicated that SIC ratios tend to minimize the amount of competition and to over-state the degree of oligopolistic concentration, further analysis of the divisions in this sample showed the opposite--oligopolistic concentration was under-stated in rapidly growing industries. As a result of this reexamination of SIC criteria, the research data in this dissertation should be analyzed from a three cell perspective as shown in the above classification using SIC data and company information. The remainder of this chapter will examine the hypotheses from a three cell perspective as follows:

Hypothesis I, testing for the effects of market structure, will be examined in stable industries only.

Hypothesis II, testing for the effects of environmental change will be examined on the basis of four stable divisions, compared with four rapidly growing divisions.

Hypothesis III, testing how thoroughly rapidly growing organizations are organic, will be examined using data from the rapidly growing industries.

Before examining further the three hypotheses, an analysis of the data in terms of the research instruments is desirable, because the three formality of structure instruments had important inter-relationships which need to be understood before analyzing the hypotheses. In addition, the methodology of classifying industries as either stable or rapidly growing merits further attention.

Analysis of Data Classifying Divisions  
as Stable or Rapidly Growing

In determining whether a division should be classified as stable or dynamic, the four digit SIC code was of direct benefit for five of the eight divisions. For the other three divisions, internal company sources provided adequate information for purposes of classification. A summary of SIC and company data is shown in Table IV.

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Insert Table IV here

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As the table indicates, rate of sales growth was a useful method of determining whether an industry is stable or rapidly growing. The four dynamic divisions each had sales growth rates exceeding 13 percent, whereas the stable divisions each had sales growth rates of eight percent or less. Plant and equipment investment data

Table IV

## SUMMARY OF SIC AND COMPANY DATA

Stable or Dynamic	Division	Concentration Classification		Annual Rate of Growth		Plant and Equipment Investment Data	
		Per SIC Data	After Discussion with Division	SIC (1967-72)	Company (1971-75)	Annual Rate of P&E Growth (1971-75)**	% of P&E to Sales (1974-75)
Stable	A	Low	Low	6%	8%	46%	10%
Stable	B	Low	Low	3%	less than 7%*	N.A.	N.A.
Stable	D	High	High	--	--	--	2%
Stable	E	High	High	N.A.***	4%	11%	9%
Dynamic	G	Low	High	16%	more than 15%*	N.A.	N.A.
Dynamic	H	High****	High	N.A.	more than 15%*	N.A.	N.A.
Dynamic	J	High	High	13%	33%	75%	13%
Dynamic	I	Low	High	N.A.***	20%	--	8%

\*Company documents were not made available for Divisions B, G and H although verbal estimates by division executives of sales growth were provided.

\*\*Since P&E expenditure varied considerably from year to year, the two year period of 1971 and 1972 was compared with the two year period of 1974 and 1975.

\*\*\*Although the four digit SIC code provided the ability to determine concentration ratios, the code was too broad to specifically identify rate of sales growth applicable to the division.

\*\*\*\*This division falls within the not elsewhere classified category of SIC data because of the special nature of its product. However, the division has unusual technology which provides the company with virtually no competition.

was erratic and difficult to compare across industries. One of the stable divisions had data which showed high investment expenditures, whereas one of the rapidly growing divisions had data which showed very low expenditures.

The implication for future research is that the sole use of sales growth data over a period of five or more years appears to be a satisfactory measure for classifying industries as stable or dynamic. Where feasible, a combination of SIC and company sales growth data should be used over a significant period of time for the following reasons:

1. This method has the advantage of being objective in comparison to perceptual measurements.
2. Plant and equipment investment data is erratic.
3. Sales growth data can be used to compare technologically different industries.
4. Evidence from this study shows that statistically significant differences in formality of structure were obtained by using sales growth data as a means of classification.

Analysis of Formality  
of Structure Data

Because formality of structure is a broad area with many attributes, three different instruments were used to examine its various aspects. Inkson et al. were selected to analyze organizational structuring of activities; Hage and Aiken were chosen to measure the degree of employee job autonomy; and Gordon's Work Environment Preference Scale (WEPS) was selected to measure the bureaucratic attitudes of employees. Theoretically, the results from the three instruments should be consistent because one can logically argue that higher structuring of activities (more specialization and role formalization) reflect efforts by management to control employee behavior, and that this should lead to an organization whereby employees have a low degree of job autonomy and a high degree of bureaucratic orientation. Briefly, the research results from the three instruments are summarized in Table V.

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Insert Table V here

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The first major finding with respect to cross-analyzing the data from the three instruments is that Inkson et al. showed higher formality of structure in dynamic industries, whereas the other two instruments showed higher formality of structure in stable industries. Thus, the data appears to be contradictory.

Table V

## ANALYSIS OF FORMALITY OF STRUCTURE DATA

<u>Author</u>	<u>Instrument Focus</u>	<u>Entire Sample</u>	<u>Research Results</u>			
			<u>Statistically Significant Presence of Higher Formality of Structure</u>			
			<u>Individual Functions</u>			
			<u>Manufacturing</u>	<u>Marketing</u>	<u>Engineering</u>	<u>Accounting</u>
Gordon	Individual attitudes towards organizational bureaucracy	STABLE--Employees' attitudes in stable businesses were more bureaucratically oriented	Stable	Stable	No significant difference	No significant difference
Hage and Aiken	Degree of job autonomy	STABLE--Jobs in stable businesses were more tightly controlled	Stable	Stable	Stable	No significant difference
Inkson et al. (1970)	Specialization and role formalization	DYNAMIC--Dynamic businesses had more structuring of activities				

Two possible explanations for this surprising research finding may stem from the nature of the data gathering: (1) Inkson et al. (1970) uses objective data, whereas the other two instruments rely on attitudinal responses; (2) the unit of analysis for the Inkson et al. questionnaire is the firm in comparison to the employee being the unit of measure for the other two instruments.

Another explanation may develop from raising the general question of how much automatic linkage there is between organizational structuring of activities as measured by Inkson et al. and employee job autonomy. One can argue that there will be only a slight linkage if structuring of activities is used merely as an instrument for general organizational coordination rather than as a method for specifically controlling employee behavior. This more benign viewpoint of structuring of activities is supported by an analysis of the work flow integration data (which measures production technology) with the structuring of activities data. As shown below, the four rapidly growing divisions had the highest structuring of activities scores and the highest work flow integration scores. However, the rapidly growing divisions also had the lowest scores on the Hage and Aiken formality of structure instrument.

	<u>Div.</u>	<u>Work Flow Integration</u>	<u>Structuring of Activities</u>	<u>Hage &amp; Aiken</u>	<u>Gordon</u>
Rapidly	G	12	34	6.6	27.0
Growing	H	11	36	-	-
	J	11	33	6.6	25.9
	I	9	30	6.8	28.9
Stable	A	9	30	7.5	29.7
	B	8	24	7.6	29.6
	D	7	27	7.0	28.3
	E	3	28	7.2	28.0

Thus, it appears that although higher work flow integration leads to higher organizational structuring of activities, it does not necessarily lead to less employee job autonomy. The degree of job autonomy appears to be more affected by the rate of environmental growth.

The importance of the rate of environmental growth in affecting job autonomy is accentuated by a further analysis of dynamic division I and stable division A, both of which had the same scores on the work flow integration and structuring of activities measurements. From a technological and structural viewpoint, these two divisions should have had similar scores on the bureaucratic orientation and job autonomy instruments. However, the scores on both instruments showed higher formality of structure in the stable division with statistical significance achieved for the job autonomy instrument. One can directly infer from the above data that the rate of environmental growth, not production technology, is the critical variable in determining job autonomy.

In summary, an analysis of the data from eight divisions suggests at least two separate relationships within the broad subject of formality of structure:

1. When technology is more advanced, a higher degree of structuring of activities will exist as measured by specialization and role formalization.

2. A high rate of environmental growth will outweigh organizational structuring of activities and lead to higher employee job autonomy.

Another finding with respect to cross-analyzing the formality of structure research data is that in terms of statistical significance between stable and rapidly growing businesses, aggregate Hage and Aiken scores, as shown in Table VI, coincided with WEPS scores in manufacturing, accounting and marketing. In engineering, the results were consistent, although statistical significance was achieved for Hage and Aiken, but not for the WEPS.

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Insert Table VI here

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For the entire sample, there was a high degree of inter-correlation (.2766 Pearson correlation coefficient) between the Gordon and Hage and Aiken instruments for which several explanations can be offered. To begin with, relatively higher scores on both instruments were obtained in the stable businesses as opposed to the dynamic businesses, thus perhaps creating a natural inter-correlation. Also,

Table VI

COMPARISON OF GORDON AND HAGE AND AIKEN INSTRUMENTS  
STABLE VS. RAPIDLY GROWING BUSINESSES

Hage and Aiken: Job Autonomy\*

	<u>Manufacturing</u>	<u>Engineering</u>	<u>Marketing</u>	<u>Accounting</u>	<u>Total</u>
Stable	7.5	7.2	7.6	7.0	7.3
Rapidly Growing	<u>6.5</u>	<u>6.1</u>	<u>6.5</u>	<u>7.3</u>	<u>6.6</u>
Difference	1.0**	1.1**	1.1**	(.3)	.7***

Gordon: Bureaucratic Orientation\*\*\*\*

Stable	30.6	27.6	28.5	28.5	28.9
Rapidly Growing	<u>26.7</u>	<u>26.4</u>	<u>26.0</u>	<u>28.5</u>	<u>26.9</u>
Difference	3.9**	1.2	2.5	--	2.0***

\*The lower the score, the greater the degree of job autonomy. Five questions were asked with a possible score per question of 0 to 3. The range per employee is 0 to 15.

\*\*Statistical significance at 5 percent using a one-tail T-test.

\*\*\*Statistical significance at 1 percent using a two-tail test.

\*\*\*\*The higher the score, the greater the degree of bureaucratic orientation. Scoring is in accordance with Gordon (1973).

one can expect a process whereby employees with lower bureaucratic orientation might seek out situations with higher job autonomy. Similarly, employees with higher bureaucratic orientation might tend to accept job situations with less job autonomy.

### Analysis of Specific Hypotheses

During the following analysis of specific hypotheses, the Hage and Aiken scale will be used as the instrument to measure formality of structure for the reasons below:

1. Structuring of activities as measured by Inkson et al. appears to have been highly related to production technology rather than to environmental change.

2. The Gordon instrument appears to measure the individual's attitudes independent of his job more than it measures his response to the work situation.

3. The Hage and Aiken instrument specifically measures how the organization is directly controlling the job autonomy of its employees.

### Hypothesis I

Regardless of the rate of environmental change, all functions in monopolistic, competitive industries will have less formality of structure in comparison to the corresponding functions in oligopolistic industries.

Due to the previously discussed transformation of the SIC data for the rapidly growing businesses, it was only possible to test this hypothesis in stable industries.

Result - As shown in Table VII, the hypothesis was not verified for any of the functions. In fact, with the exception of marketing and accounting professionals, the results were in the opposite direction of the hypothesis. The competitive divisions had higher formality of structure scores than the oligopolistic divisions with statistical significance achieved for manufacturing.

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Insert Table VII here

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Hypothesis II

Regardless of market structure, all functions in dynamic industries will have less formality of structure in comparison to the corresponding functions in stable industries.

Result - As shown in Table VIII, the hypothesis was verified for manufacturing, engineering and marketing, but not for accounting.

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Insert Table VIII here

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Hypothesis III

In dynamic environments, the externally oriented functions of engineering and marketing will have significantly less formality of structure than the internally oriented functions of manufacturing and accounting.

Table VII

JOB AUTONOMY SCORES IN STABLE BUSINESSES  
COMPETITIVE, VS. OLIGOPOLISTIC INDUSTRIES

	<u>All Employees*</u>				
	<u>Manufacturing</u>	<u>Engineering</u>	<u>Marketing</u>	<u>Accounting</u>	<u>Total</u>
Competitive	8.2	7.4	7.9	6.9	7.6
Oligopolistic	<u>6.9</u>	<u>6.9</u>	<u>7.4</u>	<u>7.2</u>	<u>7.1</u>
Difference	1.3**	.5	.5	(.3)	.5
	<u>Professionals</u>				
Competitive	7.9	7.0	7.2	6.3	7.1
Oligopolistic	<u>6.8</u>	<u>6.5</u>	<u>7.4</u>	<u>7.0</u>	<u>6.9</u>
Difference	1.1	.5	(.2)	(.7)	.2
	<u>Non-Professionals</u>				
Competitive	9.0	8.2	9.2	8.1	8.6
Oligopolistic	<u>7.2</u>	<u>7.7</u>	<u>7.6</u>	<u>7.7</u>	<u>7.6</u>
Difference	1.8	.5	1.6	.4	1.0

\*Details of sample size are available in Table III.

\*\*Statistical significance at 5 percent using a one tail T-test.

Table VIII

EMPLOYEE JOB AUTONOMY  
STABLE VS. RAPIDLY GROWING BUSINESSES

	<u>All Employees*</u>				
	<u>Manufacturing</u>	<u>Engineering</u>	<u>Marketing</u>	<u>Accounting</u>	<u>Total</u>
Stable	7.5	7.2	7.6	7.0	7.3
Rapidly Growing	<u>6.5</u>	<u>6.1</u>	<u>6.5</u>	<u>7.3</u>	<u>6.6</u>
Difference	1.0**	1.1**	1.1**	(.3)	.7***
	<u>Professionals</u>				
Stable	7.3	6.8	7.3	6.6	7.0
Rapidly Growing	<u>5.5</u>	<u>5.0</u>	<u>6.2</u>	<u>7.3</u>	<u>6.0</u>
Difference	1.8***	1.8***	1.1**	(.7)	1.0***
	<u>Non-professionals</u>				
Stable	8.1	8.0	8.5	7.9	8.1
Rapidly Growing	<u>8.4</u>	<u>8.0</u>	<u>7.5</u>	<u>7.2</u>	<u>7.8</u>
Difference	(.3)	-	1.0**	.7	.3

\*Details of sample size are available in Table III.

\*\*Statistical significance at 5 percent using a one-tail T-test.

\*\*\*Statistical significance at 1 percent using two-tail test.

Result - As shown below, the lowest formality of structure scores were achieved by manufacturing, engineering and marketing professionals in the dynamic businesses which suggests that those employees most directly connected to the changing technology and market in a rapidly growing industry have the most job autonomy.

Rapidly Growing Businesses  
Average Formality of Structure Scores  
as Measured by Hage and Aiken

	<u>Manufac-</u> <u>turing</u>	<u>Engineer-</u> <u>ing</u>	<u>Market-</u> <u>ing</u>	<u>Account-</u> <u>ing</u>	<u>Total</u>
Profes- sionals	5.5	5.0	6.2	7.3	6.0
Non-Profes- sionals	8.4	8.0	7.5	7.2	7.8

The manufacturing, engineering and marketing non-professionals, who probably have little customer contact and who most likely are implementing instructions from professional employees, had the highest formality of structure scores. The results for accounting employees were in the middle range.

This pattern of evidence does support the idea of a difference in formality of structure resulting from a distinction between an external environment orientation and an internal organizational orientation.

Supplemental Analysis:  
Bureaucratic Orientation and Job Satisfaction

Data from the WEPS yielded interesting relationships among three variables--bureaucratic orientation, job autonomy, and job satisfaction. These important results were made possible because there was a considerable variation in WEPS scores. WEPS scores varied from 5 to 44 with one standard deviation encompassing a range of 22 to 35. This range is highly significant when one considers that an employee achieving a score of 22 is disagreeing with approximately one-half of the responses of an employee achieving a score of 35. In terms of the relationship of the WEPS to the JDI, Pearson inter-correlations of less than .07 were achieved for each of the five dimensions of the JDI, which suggests that the WEPS is independent of the JDI.

To facilitate analysis on how differences in bureaucratic attitudes affect job satisfaction, the total sample was divided into roughly three categories as follows:

1. Those scoring in the lower one-third in bureaucratic orientation;
2. Those scoring in the middle one-third in bureaucratic orientation; and
3. Those scoring in the upper one-third in bureaucratic orientation.

After dividing the total sample into three bureaucratic categories, the data for professional and non-professional employees was then examined separately for the

effect of job autonomy on job satisfaction. As shown below, the overall response to job autonomy by non-professionals with low bureaucratic scores was broadly comparable to non-professionals with high bureaucratic scores. Three of the five dimensions (work, supervision, and promotion opportunities) had similar correlations for both the high and low bureaucratic groups.

Pearson Correlations Between Job Autonomy  
and the JDI for Non-Professionals

	<u>Lower One-third</u>	<u>Upper One-third</u>
Work	- .04	- .01
Supervision	.17	.12
Pay	-	.23
Promotion opportunity	- .24	- .15
Co-workers	.10	- .18

The other two dimensions can be considered to roughly offset each other, because the high bureaucratic group had positive inter-correlations for pay, whereas the low bureaucratic group had more positive inter-correlations for co-worker relationships.

In contrast to the non-professionals, the response to job autonomy by high bureaucratic and low bureaucratic professionals was quite different:

Pearson Correlations Between Job Autonomy  
and the JDI for Professionals

	<u>Lower One-third</u>	<u>Upper One-third</u>
Work	.41	- .05
Supervision	.43	.14
Pay	.04	.13
Promotion opportunity	.24	.03
Co-workers	.20	- .17

As shown above, professional employees with high WEPS scores were relatively neutral to variations in job autonomy; however, professionals with low WEPS scores had positive reactions to job autonomy in all dimensions, particularly in satisfaction with work and supervision.

To analyze these differences in more detail, the data for professional employees was arrayed into three significant groupings as detailed below:

1. Manufacturing, engineering, marketing and accounting;
2. Lower one-third and upper two-thirds in bureaucratic orientation (data for the middle one-third and upper one-third were studied separately; however, since the results were similar they were combined for this analysis); and
3. Stable and rapidly growing industries.

These groupings are used in Table IX which displays the inter-correlations among the WEPS, Hage and Aiken and JDI.

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Insert Table IX here

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Table IX

DIFFERENCES AMONG PROFESSIONAL EMPLOYEES IN BUREAUCRATIC ATTITUDES  
PEARSON CORRELATIONS BETWEEN JOB AUTONOMY AND JOB SATISFACTION

	Manufacturing					Marketing				
	All	Low 1/3	Upper 2/3	Stable	Rapid Growth	All	Low 1/3	Upper 2/3	Stable	Rapid Growth
Work	.06	.13	.03	.04	.16	.23	.48*	.19	.13	.45*
Supervision	.27	.34*	.23	(.01)	.50*	.27	.61*	.15	.18	.33*
Pay	.09	.02	.12	.16	--	.26	.18	.27	.22	.30*
Promotion	(.02)	.29	(.21)	(.23)	.08	.23	.45*	.17	.13	.21
Co-workers	(.03)	(.04)	(.01)	(.26)	(.38)	.09	.43*	(.10)	.05	.06

  

	Accounting					Engineering				
	All	Low 1/3	Upper 2/3	Stable	Rapid Growth	All	Low 1/3	Upper 2/3	Stable	Rapid Growth
Work	.20	.51*	.02	.19	.19	.20	.47*	.09	(.04)	.54*
Supervision	.23	.49*	.14	.25	.20	.26	.19	.26	.32*	.36*
Pay	(.05)	(.10)	(.02)	.01	(.15)	.28	.51*	.07	.30*	.27
Promotion	.06	.03	.09	.05	.14	.11	.11	.11	.07	(.04)
Co-workers	.03	.14	(.01)	.05	(.01)	.01	.28	(.27)	(.07)	.06

\*Correlations of .30 or better

The effect is quite dramatic. The lower one-third category had positive correlations with job autonomy that were far higher than the upper two-thirds category, with the greatest impact in work and supervision. For the lower one-third category, some of the correlations were significantly high, ranging from .43 to .61 in three out of four functions; but in the upper two-thirds category, all correlations were less than .30.

As also shown in Table IX, the rapidly growing industries had more positive correlations between the JDI and job autonomy than did stable industries. This can partly be explained because the rapidly growing businesses had a larger percentage of low bureaucratically oriented employees. The table below shows that whereas stable businesses had a balanced distribution among employees in bureaucratic attitudes, the rapidly growing businesses had a distribution skewed towards bureaucratically independent employees.

Distribution of Bureaucratic Attitudes  
Among Stable and Rapidly Growing Businesses

(Low/Medium/High Percent)

	<u>Manufacturing</u>	<u>Engineering</u>	<u>Marketing</u>	<u>Finance</u>
Stable	31/40/29	34/26/40	28/39/33	28/42/30
Rapidly Growing	41/48/11	46/37/17	42/37/21	33/45/22

The foregoing analysis of differences in bureaucratic attitudes shows that job autonomy is far more important to professional employees with a low bureaucratic orientation than to any other employee grouping.

### Research Results Summary

1. Hypothesis I (Industrial Concentration) - Contrary to the hypothesis, in stable growth businesses job autonomy was greater in oligopolistic industries than in competitive industries, particularly for non-professional employees. However, statistical significance was achieved only in manufacturing.

2. Hypothesis II (Environmental Change) - The rate of sales growth had a statistically significant impact on job autonomy for all professionals except accounting.

3. Hypothesis III (Degree of Organicity Within Rapidly Growing Divisions) - In rapidly growing businesses, the data supported the idea that formality of structure is affected by the external versus internal orientation of the employee.

4. At least two types of formality of structure appear to exist: (a) structuring of activities which may be related to technology and (b) job autonomy, which appears to be affected by the degree of sales growth.

5. The rate of sales growth has several advantages as a measuring device to classify industries as stable or dynamic. Plant and equipment data appears to be too erratic to be used consistently as a measurement tool.

6. Whereas variance in bureaucratic scores had little effect on non-professionals, differences among professional employees in bureaucratic attitudes had a

considerable impact on the inter-correlations between job satisfaction and job autonomy. Professional employees with low bureaucratic orientation scores responded much more positively to job autonomy than employees with higher bureaucratic orientation scores.

## CHAPTER V

### A REEXAMINATION OF ORGANIZATIONAL THEORY

The data as discussed in the previous chapter yielded three unique findings which require further study of the literature in order to understand their theoretical meaning and inter-relationship. The three findings were as follows:

1. The impact of the environment on formality of structure varied depending on the professional or non-professional status of employee groupings.

2. Higher industrial concentration was associated with less formality of structure for non-professional employees, contrary to the hypothesis.

3. The SIC industrial concentration data was not fully applicable. It appeared that within rapidly growing industries the company was concentrating on oligopolistic markets rather than more competitive markets.

To better understand the above findings, the literature was reanalyzed and a revised theoretical formulation was developed combining the following approaches:

1. A comparative review of various organizational theories (classical, human relations, bureaucratic, contingency, and entrepreneurial) was undertaken with

an emphasis on the various dimensions of formality of structure;

2. J.D. Thompson's distinction between the managerial level and the technical core was reexamined because the evidence in this study showed differences between professional and non-professional employees;

3. Emery and Trist (1965) was reanalyzed because of their emphasis on the effect of competition and technological change on organizational behavior;

4. The organizational and environmental analysis was then integrated;

5. New hypotheses were developed and, finally

6. The research results testing the new hypotheses were analyzed.

#### Comparative Review of Organizational Theories

A review of various organizational theories begins with a discussion of classical theory. Classical theory stresses clear lines of hierarchical authority and emphasizes that a manager have a high degree of knowledge of his subordinates' task requirements and performance. As a result, classical theory recommends that the span of control be small enough (ideally five or six) to allow managerial understanding and direction. Close managerial direction of employees has resulted in detailed job specifications (e.g., time-motion studies) to control

employee behavior with the result that job autonomy can be minimal. Classical theory's emphasis on control and coordination has also expressed itself in exhortations that management have well documented plans so that each level in the hierarchy will clearly know how to conduct its activities in conjunction with the rest of the organization. To facilitate a comparative analysis of classical theory with other organizational theories, the elements of the above discussion have been listed in Table X, and then analyzed in comparison to other organizational theories.

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Insert Table X here

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The five top elements have been grouped together as structuring of activities for the following two reasons:

1. The elements all have relevance to how the organization structures itself to achieve general overall coordination, and

2. The term 'structuring of activities' has been used and validated by Inkson et al. (1970) in empirical studies.

Job autonomy has been identified separately because the empirical evidence in this study showed it can vary independently from structuring of activities.

Bureaucratic theory is very similar to classical theory. The elements within structuring of activities

Table X

ORGANIZATIONAL THEORIES  
COMPARATIVE ANALYSIS - FORMALITY OF STRUCTURE

<u>Organizational Attributes</u>	<u>Classical</u>	<u>Bureaucratic</u>	Human Relations (neo- Scientific)	<u>Contingency</u>		<u>Entrepreneurial</u>
				<u>Mechanistic</u>	<u>Organic</u>	
<u>Structuring of Activities</u>						
Decision making process	Highly structured/ chain of command	Highly structured/ rules oriented	Highly structured/ participative	Highly structured/ chain of command	Loosely structured/ participative	Loosely structured/ autocratic
Documented planning emphasis	High	High	High	High	Low	Low
Span of control	Small	Small (Large if rules can control)	Small	Small (Large if controllable)	Small or large	Small or large
Role formalization	High	High	High	High	Low	Low
Role specialization	High	High	Medium	High	Low	Low
Overall structuring of activities	High	High	High/ Participative	High	Low	Low
<u>Job Autonomy</u>	Low	Low	High	Low	High	Low

are relied on to achieve organizational control. The difference between bureaucratic and classical theories is one of emphasis with bureaucracies relying more on written documents as the basis for decision making. Once rules and regulations are specified by upper echelons in writing, lower echelons can often implement them without upward consultation. Job autonomy is minimal because rules and regulations specify what is to be done.

Human relations theory has questioned the abstract, logical designs of classical theory, and has stressed the importance of psychological factors in organizational behavior. The human relations school recommends that managers seek the participation of subordinates in the decision making process and have an attitude of being employee centered rather than job centered. The reasoning is that a satisfied employee will motivate himself to achieve high productivity and thus require minimal supervision. In contrast, job-centered managers need to spend more time on task oriented supervision (Likert, 1961). As a result of the empirical research conducted by the human relations school, several writers have concluded that managing human beings in the modern world is not merely a matter of applying abstract principles of organization, but, instead, is a multi-faceted process requiring a sophisticated range of skills. Many of these writers have recommended that managers view themselves as professionals who use scientific techniques to achieve organizational objectives.

An important part of being a modern, professional manager is to use human relations skills to achieve a maximum of integration between organizational and individual goals. Khandwalla (1977) uses the term "neo-scientific" to identify this organizational approach, and describes it as being characterized by:

....A heavy reliance on sophisticated long range planning, modern management techniques like market research and operations research, participative humane management, a fair degree of emphasis on structuring managerial and staff roles, activities and relationships, and an aversion to arbitrary, coercive, managerial behavior. Management is seen as a profession, a science rather than as an "art." Efficiency and steady growth are strongly emphasized. Neo-scientific managements are frequently quite conservative....(pp. 24-25).

In terms of the comparative analysis shown in Table X, a neo-scientific, human relations approach would be high in structuring of activities, but would incorporate participative techniques, and, wherever possible, allow high job autonomy.

Contingency theory advocates use of either a mechanistic or organic approach. The mechanistic style has essentially the same elements as classical theory, with a reliance on a formal chain of command structure. The organic style stresses a flexible low structure organization that can quickly adapt to change. Thus authority is participative; documented planning is minimal; small spans of control are unnecessary; and jobs need not be precisely defined. Over all structuring of activities is low and job autonomy is high.

In addition to discussing the neo-scientific style of management, Khandwalla also referred to an entrepreneurial style. He described it as being characterized:

....by bold, risky, aggressive decision making, charismatic leaders, a strong commitment to growth, an emphasis on administrative flexibility, and reliance on intuitive judgments....Since the practitioners of this style are in the habit of seizing opportunities before all the facts about them are known, they put a premium on managerial flexibility so that the organization rapidly adapts to the evolving situation. They are not very comfortable with technocratic and participative models of decision making because they find them cumbersome and time consuming. Since bold moves imply frequent major organizational changes, the entrepreneurial management may occasionally be quite coercive.... (p. 25).

Thus structuring of activities is minimal, but job autonomy can be low because the entrepreneur often closely controls his organization via his personal authority.

Based on differences in formality of structure, the seven theories described above can be condensed into four separate theories as shown in Table XI.

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Insert Table XI here

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The classical, bureaucratic and mechanistic theories have many similarities and can be grouped together as classical/administrative because they all have high structuring of activities and low job autonomy. The neo-scientific approach is significantly different from classical theory because it advocates employee participation. The main effect of this approach can be considered

Table XI

A SUMMARY OF ORGANIZATIONAL THEORIES  
 BASED ON DIFFERENCES IN FORMALITY OF STRUCTURE

	<u>Classical/ Administrative</u>	<u>Human Relations/ Neo-scientific</u>	<u>Organic</u>	<u>Entrepreneurial</u>
Structuring of Activities	High	High	Low	High
Job Autonomy	Low	High	High	Low

to apply to job autonomy. Although the methods used to achieve structuring of activities may differ in the neo-scientific approach in comparison to classical theory, the emphasis on a scientific professional style does imply a systematically structured organization. Both the organic and entrepreneurial approaches see little value in formal structuring of activities; however, the organic approach allows more job autonomy, whereas the entrepreneurial style is more directive towards subordinates.

#### Review of J.D. Thompson

The above comparative analysis focuses on organizational theories from a managerial viewpoint. The role of non-professionals is barely mentioned, but the research evidence in this study did show important distinctions between professionals and non-professionals which merit further study of J.D. Thompson (1967).

Thompson divides organizations into two major parts: the managerial level and the technical core. The managerial level can be viewed theoretically as being more important because it has the critical function of analyzing the environment and then directing the technical core to respond appropriately. The managerial level thus acts as an independent variable and determines the behavior of its dependent variable--the technical core. If an organization is to be successful in its integration with the environment, it is vitally important that the

managerial level be structured in such a way that it has the intelligence gathering and decision making capabilities to determine the optimum fit between the technical core and the environment. The functions of the managerial level and the technical core are thus quite different. The managerial level analyzes the environment and makes decisions; the technical core implements the decisions of the managerial level. This difference in organizational function may explain why the job autonomy scores of professionals and non-professionals diverged significantly in this study.

#### Emery and Trist: Four Types of Environments

An understanding of Emery and Trist will assist us in determining the capabilities required of the managerial level to be able to operate in different kinds of environments. According to Emery and Trist (1965) the Type I environment of pure competition is the least complicated of the four types, because environmental variables are relatively simple and randomly distributed over a wide area. In terms of an organizational response, this means that little is to be gained by thoroughly analyzing the environment, because no systematic patterns exist which can be easily exploited. Under these conditions, the optimum organization is small and concentrates on learning by trial and error how to best serve a limited, local market. The need for a managerial

level is extremely limited and the organizational emphasis should be on the efficient performance of simple technical core tasks.

The Type II environment is the economic equivalent of monopolistic competition, with the relevant environmental variables grouped together in small clusters. Therefore, it becomes desirable for an organization to search the environment in order to find a good location and then to perform technical core tasks as efficiently as it can. To achieve this, Emery and Trist suggest that firms need to develop a strategy and corresponding tactics that concentrate organizational resources in order to reach major objectives. The managerial level in this environment has two important functions: one is to intelligently scan the environment, and the second is to actively control and coordinate the technical core. Organizations under monopolistic competitive conditions will thus tend to be hierarchical with an emphasis on centralized control and coordination.

The Type III environment corresponds to oligopolistic markets. The key new factor in comparison to Type II environments is that the managerial level must consciously analyze the potential responses of its competitors when making decisions. In addition to needing strategy and tactics, organizations must have the ability to develop and implement operations. An operation takes into account

potential competitive responses. It is a pre-planned campaign of initial tactical moves, anticipation of competitive reactions, and counter actions, with a premium being placed on flexibility and timely decision making skills. It is possible within oligopolistic environments that an intense exchange of actions and counter actions will take place which can result in fierce competitive battles. In such situations, a firm must have the intelligence to "know when not to fight to the death" (p. 26). Because of the potential for confrontations that injure all parties concerned, there often develops a willingness for the various interest groups within oligopolistic environments (including labor and government) to reach an accommodation among themselves. Type III environments thus require that organizations have both offensive and defensive capabilities. Offensive capabilities are needed to develop and implement plans to achieve organizational growth; defensive capabilities are needed to counteract any obstacles that can come from competitors, government, or labor. In combining offensive and defensive strategies, the organizational objective is to develop the "capacity (and) power to move more or less at will" (p. 26).

The managerial level in oligopolistic environments needs to be more sophisticated in comparison to monopolistic competitive environments. In monopolistic competitive environments, several potentially successful locations

exist; the critical task is simply to find such a location and aggressively maximize performance. A defense is not needed because if a firm has a good location and performs successfully, potential competitors will seek an alternative location rather than waste energy fighting an efficient competitor directly. In oligopolistic environments firms cannot disappear from each other. Everyone is very visible and it is essential that the managerial level have the sophistication to develop strategies, operations, and tactics.

The most complex environments are Type IV turbulent fields which are characterized by extensive inter-relationships among many variables and by a heavy reliance on research and development which can lead to unpredictable changes. The possibility of a sudden dramatic change within turbulent fields often poses a challenge to an organization seeking to maintain a stable relationship between itself and the environment. The challenge exists because the firm is less able to control its destiny simply via its own actions, especially in comparison to Type III environments. Type IV environments thus require that the managerial level have a very sophisticated flexibility to deal with rapid change.

### Integration of Organizational and Environmental Analysis

This chapter has studied various organizational theories and has also discussed four types of environments. It is now appropriate to integrate the organizational and environmental analysis. This can be done by analyzing which of the four organizational theories summarized in Table XI are most appropriate for each of the environments discussed by Emery and Trist. This analysis is shown in Table XII.

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Insert Table XII here

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The Type I environment calls for a minimum of organizational structure; therefore a simple entrepreneurial style appears most appropriate. The Type II environment favors a more structured organization with centralized control and coordination. Thus a classical/administrative approach appears to be the most suitable. Oligopolistic Type III markets require more managerial sophistication; therefore, a neo-scientific style with high structuring of activities and higher job autonomy for the managerial level may be the most appropriate for oligopolistic environments. In turbulent Type IV fields, high structuring of activities can be counter productive--particularly if it slows down decision making in a rapidly changing environment. However, the role of job autonomy is not exactly clear. In entrepreneurial firms,

Table XII

INTEGRATION OF ORGANIZATIONAL AND ENVIRONMENTAL ANALYSIS

	<u>Type I</u> Pure <u>Competition</u>	<u>Type II</u> Monopolistic <u>Competition</u>	<u>Type III</u> Oligopoly	<u>Type IV</u> Turbulent <u>Competition</u>
Managerial Style	Entrepreneurial	Classical/ Administrative	Neo-scientific	Organic or Entrepreneurial
Structuring of Activities	Low	High	High	Low
Job Autonomy	Low	Low	High	High (Organic) or Low (Entrepreneurial)

management can quickly respond to sudden events simply by issuing orders which would mean subordinates would have low job autonomy. On the other hand, an organic, participative approach with high job autonomy could lead to a flexible organization which could quickly respond to new situations.

#### Reanalysis of the Research Results

The above theoretical analysis now needs to be applied to the empirical evidence of this study. One major characteristic of the evidence is that Type I and Type IV environments were not examined; only Type II and Type III environments were studied. However, the Type III environment showed two major categories--stable growth and rapid growth oligopolies. A summary of the reanalysis of the data is shown in Table XIII.

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Insert Table XIII here

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Overall, because of the high structuring of activities within the firm, and because of the company's expressed goal of being professionally managed, the firm can be described as having a neo-scientific philosophy. But, even within this neo-scientific classification, job autonomy varied depending on the environment. In rapid growth oligopolies, the environment was more dynamic, thus requiring greater flexibility and higher job autonomy within the managerial level. However, the technical core within rapid growth

Table XIII

REANALYSIS OF THE RESEARCH RESULTS

	Environment		
	<u>Type II</u>	<u>Type III</u>	<u>Type III</u>
<u>Organizational Structure</u>	Stable Growth Monopolistic Competition	Stable Growth Oligopoly	Rapid Growth Oligopoly
Structuring of Activities	High	High	High
Job Autonomy - Professional (Managerial Level)	Medium	Medium	High
Job Autonomy - Non-professional (Technical Core)	Low	Medium	Medium

oligopolies had a roughly comparable degree of job autonomy as in stable oligopolies because its function of implementing instructions from the managerial level was the same in both environments.

As for the effect of industrial concentration, the managerial level in the stable growth divisions had similar job autonomy scores in both oligopolistic and monopolistic competitive environments. One explanation for this may be that because the environment was essentially stable in both types of markets, the analytic work of the managerial level was similar. However, differences between the two kinds of environment may have affected the technical core because there may have been a greater necessity for the managerial level to control the non-professionals in the monopolistic competitive industries due to competitive pressures. Management within one of the two competitive divisions said that because pricing was the most important market factor, there was constant pressure to minimize costs. Thus, the managerial level may have felt a strong need to control the technical core to minimize unnecessary expense. In stable growth oligopolies, the need for tight control of the technical core may not have been as great because the market shares were more secure. In addition, there are some other studies (Khandwalla, 1970, 1972, 1977; Neghandi and Reiman, 1972, 1973; Pfeffer and Leblebici, 1973) that offer evidence indicating that high competition may result in a somewhat tighter internal structure.

In comparison to theoretically oriented Table XII, the data in this study has required a new job autonomy description--medium. This refinement is understandable because the three different environments have led to three significantly different job autonomy atmospheres within the same neo-scientifically managed company.

The above discussion of the research data gathered in this study has analyzed the impact of the environment on one firm. Khandwalla (1977) surveyed the managerial level of 103 Canadian firms and concluded that companies were most likely to be successful if they used either a neo-scientific or entrepreneurial style, depending on the environment. The neo-scientific style was considered most appropriate for environments that were homogeneous, technologically sophisticated, and which changed at a moderate rate. The entrepreneurial style was considered most appropriate for "highly turbulent, hostile and diverse" environments. Khandwalla then went on to summarize the environmental impact on managerial styles as follows:

The contexts in which the neo-scientific style is appropriate are not, by and large, the contexts in which the entrepreneurial style is appropriate, and vice versa (p. 36).

The research data of Khandwalla, together with an analysis of Emery and Trist, appear to offer an explanation for why the company in this study concentrated on oligopolistic markets within rapidly growing industries. Being a neo-scientific firm, the company preferred environments where

a rational systematic approach could allow management "to move more or less at will" with relatively little risk. The company appeared to avoid Type IV environments because an elaborate decision making approach may be too structural to cope with turbulent fields. The Type IV environment would tend to favor an organic or entrepreneurial style that is better equipped to deal with sudden unpredictable change.

To further explore the idea that companies with high structuring of activities would avoid turbulent fields, and that entrepreneurial or organic organizations would predominate in Type IV environments, the business literature and recent annual reports were reviewed. The business literature has stressed strategic planning during the late 1970's. For example, the Boston Consulting Group as well as McKinsey and Company, have advocated a systematic analysis of markets. (See New York Times, Business Section, April 15, 1979). The two consulting firms both recommend that companies concentrate on markets where they have a strong competitive position, and be careful about industries where they have a low market share. More explicitly, fast growing industries where the firm has a low market share are labelled with a question mark, because they are risky and can easily become a cash trap absorbing large amounts of corporate resources. The extent to which this philosophy is taken seriously is indicated by a review of the annual reports of the top 20 industrial companies within the United States. For example, the 1977 Annual Report of ARCO states that "Arco will

continue to expand in areas where competitive advantages exist, particularly where it has patented technology, but growth for its own sake is not in the company interest, and any future investments will continue to be highly selective." The 1977 Mobil report mentions that the company "continued its basic strategy of concentrating on selected areas of business....where Mobil has a strong competitive position." United Technologies said it intended to acquire companies "with strong market positions in established businesses." Monsanto mentioned its "continuing program of formal business analysis." Several other reports also referred to strategic planning procedures. By and large, many of the annual reports mentioned systematic decision making procedures which were designed to achieve steady growth and to avoid unnecessary risks. Aside from referring to strategic planning processes, the annual reports did not state whether high or low structuring of activities was used in any of its particular divisions, nor was there any specific mention of job autonomy.

To see if an entrepreneurial or organic style was common to competitive rapidly growing industries, the annual reports of companies within the semi-conductor and medical instruments businesses were examined. Unfortunately, the reports were financially oriented and did not mention structuring of activities or job autonomy.

## CHAPTER VI

### DEVELOPMENT OF NEW HYPOTHESES

The development and testing of new hypotheses using the research data in this study has been based on the following approach:

1. Using structuring of activities as a measuring tool, firms can be classified as either highly or loosely structured. One key variable is the extent to which planning and appropriation routines are systematic. For example, are expenditure decisions subject to elaborate documentation, discussion and procedures, or are they based on personal judgments with a minimum of planning and documentation?

2. Based on the high structuring of activities scores achieved by all divisions, and because of elaborate appropriation procedures, the company used in this study can be described as being highly structured.

3. Being highly structured and professing a neo-scientific philosophy, the company in this study is oriented to environments where it is easier to use systematic planning to achieve growth in income and sales. Therefore, turbulent Type IV fields are avoided, and, instead, the company seeks the most favorable Type II and Type III environments, where "it can move more or less at will."

4. Within oligopolistic Type III fields, the rate of sales growth will strongly affect the job autonomy of the managerial level. Rapidly growing industries will require more decision making flexibility and, thus, the managerial level will have more job autonomy in comparison to stable industries.

5. The technical core in oligopolistic industries will not have its job autonomy significantly affected by the rate of sales growth because its function of implementing instructions is the same regardless of the rate of sales growth.

6. Stable competitive industries will put a premium on control and efficiency; therefore, the technical core will have less job autonomy than in stable oligopolistic industries.

#### New Hypotheses and Research Methodology

As a result of the above assumptions, two revised hypotheses with new research methodology have been formulated as follows:

HypothesesHypothesis A

A high rate of sales growth will increase the job autonomy of the managerial level.

Hypothesis B

Within stable industries, low industrial concentration will lead to less job autonomy for the technical core.

Research Methodology

The research data within this study will use the point bi-serial correlation technique to determine the degree of correlation between sales growth and job autonomy for professional employees.

The research data within this study will use the point bi-serial correlation technique to determine the degree of correlation between industrial concentration and job autonomy for non-professional employees.

Research Results After Using Point Bi-serial Correlations

The results from using the point bi-serial correlations are shown in Table XIV:

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Insert Table XIV here

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Among the professional employees, the manufacturing, engineering and marketing functions had a combined correlation of  $-.26$  between the rate of sales growth and job autonomy (significant to the  $.01$  level). The aggregation of these three functions into the managerial level is theoretically logical because they all deal with the external customer/product environment. Accounting can be considered separately because it is

Table XIV

POINT BISERIAL CORRELATIONS BETWEEN  
ENVIRONMENTAL FACTORS AND JOB AUTONOMY\*

	<u>Manufacturing</u>	<u>Engineering</u>	<u>Marketing</u>	<u>Accounting</u>	<u>Total</u>	<u>Total Excluding Accounting</u>
<u>Professionals</u>						
Sales growth	-.36	-.38	-.21	.15	-.19	-.26
Industrial concentration**	-.22	-.10	.04	.16	-.02	-.10
<u>Non-professionals</u>						
Sales growth	.04	-	-.16	-.15	-.07	
Industrial concentration**	-.37	-.08	-.28	-.07	-.19	-.24

\*Point biserial correlations were conducted in accordance with Maurice G. Kendall,  
Advanced Theory of Statistics (London: Charles Griffin & Company, Ltd., 1973), pp. 323-324.

\*\*Correlations were conducted only within stable industries.

primarily concerned with internal record-keeping rather than the external environment. The point bi-serial correlations for non-professionals were relatively neutral. The net effect of these results is to support J.D. Thompson's thesis that the managerial level will vary its structure, depending on the external environment, whereas the technical core will be relatively shielded from the environment.

The correlations for industrial concentration were mixed for professionals, but did show some indication of less job autonomy for non-professionals. This might be explained by positing that market pressures, particularly price competition, resulted in tighter controls on the technical core.

## CHAPTER VII

### DIRECTIONS FOR FUTURE RESEARCH IN CONTINGENCY THEORY

This dissertation has examined several areas of contingency theory, including:

- a. Sales growth
- b. Market structure/industrial concentration
- c. Technology
- d. Structuring of activities
- e. Job autonomy
- f. Bureaucratic orientation
- g. Job satisfaction
- h. Intra-organizational differences  
(Professional vs. non-professional;  
manufacturing, engineering, marketing,  
accounting; degree of contact with the  
external environment).

All of the above areas appear to be important when discussing the impact of the environment on organizational structure. However, research priorities suggest concentration on one area in particular--job autonomy. The other topics can be more easily analyzed via several research instruments, whereas well developed methods do not yet exist for measuring job autonomy. Job autonomy deserves special attention because in the chain of

several variables, beginning with the external environment and ending with the individual employee's performance and job satisfaction, job autonomy appears to be an important intervening variable and, moreover, subject to direct managerial control.

An improved employee job autonomy instrument is desirable because the Hage and Aiken questionnaire (1969) has had limited methodological work. The original Hage and Aiken instrument had ten questions relating both to bureaucratic procedures and employee autonomy, with many of the questions similar to each other. The questionnaire was administered via person to person dialogue, using a four point scale, and no reliability measures were available. To focus on job autonomy, and to minimize the length of the overall questionnaire in this study, five items specifically related to job autonomy were selected, and the scores from the five questions were summed together. In terms of future development of a job autonomy instrument, perhaps a seven point scale and additional job autonomy questions would provide improved discrimination, and assist in determining more precise inter-correlations with other instruments. Additional items for an improved instrument could be obtained from a questionnaire used by Khandwalla (1976). His questionnaire included the dimensions of participation, organicity, and coercion.

Another aspect that perhaps should be examined in future research is the nature of job requirements with particular emphasis on the degree of flexibility required for the employee to perform his assignments. As shown in Table VI, the highest degree of job autonomy existed for manufacturing, marketing, and engineering professionals in the rapidly growing industries. These employees may have had to use considerable creativity in meeting market needs. Both the non-professionals and accounting personnel in rapidly growing industries had less job autonomy, possibly because their jobs were more internally oriented, and less environmental responsiveness was required. In stable environments, external environmental characteristics may not require as much flexibility, and thus there may be less job differences between employees doing external and internal work. The variations in scores among the employee sub-groupings within this study indicate the need for new instruments to measure job autonomy and to measure differences in job requirements for various employees. Work in this area similar to that done for the JDI could lead to very valuable research tools, as well as contribute to a more empirically precise definition of formality of structure.

Employee job autonomy emerged in this study as an important variable with significant relationships to bureaucratic orientation and job satisfaction among professional

employees. The empirical data showed that professional employees with low bureaucratic orientation were very sensitive to job autonomy, whereas non-professionals and highly bureaucratic professionals were largely neutral to variations in job autonomy. The implication of this is that those managers who have an authoritarian style run serious risks of alienating a sizable portion of their professional staff, particularly in rapidly growing businesses. If the number of professional employees continues to grow within society, job autonomy will become more important, especially if the number of individuals with low bureaucratic orientation increases.

Another valuable area for future research would be to systematically study turbulent fields. An intense study of several firms within a rapidly growing, monopolistic competitive industry might help to determine the frequency and degree of success from using a classical, neo-scientific, organic or entrepreneurial approach.

The development of new job autonomy questionnaires and their use in conjunction with other high quality instruments in different types of environments would help to improve the theoretical precision of contingency theory. The simultaneous use of several research instruments would help to specify variables, and thus improve the level of empirical confidence when making predictive statements about organizational behavior. This is important because

when organizations are studied in precise rather than general terms, it becomes easier to make predictions with a high degree of probability that are applicable to specific parts of complicated organizations.

The simultaneous use of several instruments would also help to overcome Willer and Webster's criticism of 'non-cumulative empiricism.' To be able to integrate studies conducted in many organizational settings, it would be beneficial to have a sound basis for empirical aggregation. This is facilitated if various studies share:

1. the common use of high quality instruments, and
2. specific classifications which facilitate the ability to accumulate data from several studies. Possible categories include: environments, business functions, professional versus non-professional employees, small versus large organizations, and manufacturing versus non-manufacturing firms.

The future refinement of contingency theory would benefit by the use of several solid instruments in a wide variety of organizational settings. Increased precision would help to move contingency theory away from broad generalizations and closer towards the objective of the third stage of construct abduction--a comprehensive "set of abstract statements about relations between concepts which have received a reasonable degree of empirical confirmation" (Willer and Webster, 1970, pp. 755-756).

## CHAPTER VIII

### CONCLUSION

Based on a review of organizational and economic literature combined with an analysis of the empirical data in this study, the impact of the environment on organizational behavior can be summarized as follows:

1. Competition and the rate of sales growth are two key variables affecting organizational structure.

2. The empirical use of industrial concentration measurements and the rate of sales growth data can distinguish five different environments:

- Type I - Stable growth - pure competition
- Type II - Stable growth - monopolistic competition
- Type III-A - Stable growth - oligopolistic
- Type III-B - Rapid growth - oligopolistic
- Type IV - Rapid growth - highly competitive,  
turbulent fields

3. The use of strategic planning which analyzes market factors can influence whether a highly structured firm decides to participate in a turbulent field.

4. Within oligopolistic markets, a high rate of sales growth will tend to lead to higher job autonomy for those professionals that deal with the external customer

environment, specifically the business functions of manufacturing, engineering and marketing. The job autonomy of non-professionals and accounting professionals is relatively unaffected by the rate of sales growth.

5. Professionals within rapidly growing industries have a lower bureaucratic orientation than in stable growth industries, and thus tend to be more sensitive to job autonomy.

6. In stable growth industries, strong price competition may lead to lower job autonomy for the technical core.

The research conducted in this study confirmed the validity of a contingency approach to organizational behavior. However, the general, unqualified use of the terms mechanistic and organic to classify organizations can be misleading. As the evidence in this study showed, a firm can be highly structured and still have high job autonomy within its managerial level. Thus, it can be simultaneously mechanistic and organic. This apparent contradiction can be reconciled when one realizes that organizations often have thousands of employees performing a wide variety of tasks, and that different managerial styles can easily co-exist within the same organization. By using structuring of activities and job autonomy as theoretical and empirical criteria, the four categories--classical, neo-scientific, organic, and entrepreneurial--can be very descriptive and valuable.

APPENDIX

QUESTIONNAIRE SUMMARIES

ABBREVIATED CONTEXTUAL AND STRUCTURAL SCALE  
(INKSON, PUGH, AND HICKSON, 1970)

Attributes measured: technology, dependence, and structuring of activities

Questionnaire Background: Developed in 1967-1968 using 40 organizations in England as an abbreviated version of the longer questionnaire used in 52 organizations during 1962-1964.

Reliability: A general biserial correlation of .71 was obtained for structuring of activities.

Validity: Correlation with longer questionnaire for structuring of activities was .87; longitudinal validity is indicated by the six year period during which the questionnaires were used.

WORK ENVIRONMENT PREFERENCE SCHEDULE  
GORDON (1970)

Attribute measured: Bureaucratic orientation  
of employee

Questionnaire Background: Developed during 1968 to  
1970. Results have been obtained for 11 different  
employee samples.

Reliability: Test-retest reliabilities of .65 with  
16 month interval; .82 with three month interval.  
Internal consistency reliabilities range from  
.83 to .91.

Validity: Compared with several other scales and  
achieved statistically significant correlations.  
Also, the mean scores of various occupational  
groups varied with respect to degree of bureau-  
cratic orientation.

## HAGE AND AIKEN (1969)

Attribute measured: formalization, particularly  
the importance of rules

Questionnaire Background: Developed in 16 social welfare agencies during 1967. Emphasis of questionnaire is on the use of rules.

Reliability: None published.

Validity: Significant relationships were found between routine work, and questionnaire items relating to job description, and rules manual. Relationships in the predicted direction, although not statistically significant, were found between routine work and job codification and rule observation.

JOB DESCRIPTION INDEX  
(SMITH, KENDALL AND HULIN, 1969)

Attribute Measured: Five dimensions of job satisfaction--work, supervision, pay, co-workers, and promotion opportunity.

Questionnaire Background: Developed during the 1960's in five studies using a total of 3650 subjects.

Reliability: Split-half correlations ranged from .67 to .88.

Validity: Convergent and discriminant validity was established by means of the multitrait-multimethod matrix.

QUESTIONNAIRE COMPLETED  
IN EACH BUSINESS

This questionnaire asks for objective information about your business in order to compare it with other businesses. Please follow the instructions for each of the sections.

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### Technology

Please place a check mark next to the following types of equipment used in your manufacturing operations. (Detailed descriptions of the categories below are on Pages 2 through 8 of the attached Appendix).

- Hand tools and manual machines
- Powered machines and tools
- Single cycle automatic and self-feeding machines
- Machines that automatically measure and adjust their activities
- Computer control equipment

Please indicate which category above is used the most in manufacturing your products.

---



Degree of Specialization

A function is considered specialized if it has at least one person who performs that function and no other function. Please place a check mark next to each activity below for which your organization has one or more employee devoted exclusively to the functions listed below:

- Public Relations, and/or Advertising, and/or Community Affairs
- Sales
- Customer Service
- Transportation (movement of materials from one place to another)
- Employee Recruitment and/or Placement
- Employee Development (Education and Training)
- Maintenance of Human Resources and promotion of employee identification with the organization (medical or safety or employee newsletter or social activities)
- Purchasing
- Inventory Control
- Building Maintenance and/or Construction
- Accounting
- Planning (Strategic and/or Production)
- Quality Control

- \_\_\_\_\_ Production Analysis (Work study, operations research, rate-fixing, methods study, etc.)
- \_\_\_\_\_ Research (Anyone who specializes in developing new products, equipment, or production processes)
- \_\_\_\_\_ Legal and/or Insurance
- \_\_\_\_\_ Market Research
- \_\_\_\_\_ Administrative Statistics (Business analysis or similar work)

Formalization of Role Definition

Please answer the questions below.

1. Are information booklets given to  
 All employees  
 Many employees  
 Few employees  
 No employees
  
2. How many information booklets does your organization use?  
 None  
 One  
 Two  
 Three  
 Four or more
  
3. Does an organization chart exist?   
To whom is it given?  
 General Manager only  
 General Manager plus one other executive  
 General Manager plus most or all of his direct reports
  
4. Do written operating instructions exist for any of your employees?

5. Do written job descriptions exist for
- Hourly manufacturing employees
  - Line managers
  - Staff personnel
  - General Manager
6. Does your department (or division) have its own written policies?
7. Does a manual of department (or division) procedures exist?
8. Does your department (or division) have a formalized research program or written research reports?

EMPLOYEE QUESTIONNAIRE

## BACKGROUND INFORMATION

Differences in background often affect the way people view the work situation and how they feel about it. The following questions are asked so that these differences can be studied. Please place a check mark in the blank next to the appropriate response.

A) My job is in:

- Manufacturing
- Research
- Engineering
- Marketing
- Finance (Accounting)

B) I am a manager (or supervisor)

- Yes
- No

C) My pay classification is:

- Exempt
- Non-exempt

D) My age is:

- Under 35
- 35 to 50
- Over 50

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These consist of pages:

108-109

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111-113

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The following statements may or may not be true about your organization. Please give your opinion by placing a check mark in the appropriate column.

	Defi- nitely true	More true than false	More false than true	Defi- nitely false
1) How things are done around here is left pretty much up to the person doing the work	_____	_____	_____	_____
2) A person can make his own decisions here without checking with anybody else	_____	_____	_____	_____
3) Going through the proper channels is constantly stressed	_____	_____	_____	_____
4) We are to follow strict operating procedures at all times	_____	_____	_____	_____
5) The employees are constantly being checked on for rule violations	_____	_____	_____	_____

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