

AN ABSTRACT OF THE THESIS OF

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Title: A STUDY OF THE EFFECTS OF TWO ORGANIZATIONAL  
VARIABLES ON THE PERCEIVED NEED SATISFACTIONS OF  
COMMUNITY COLLEGE VOCATIONAL ADMINISTRATORS  
IN FOUR WESTERN STATES

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Abstract approved: \_\_\_\_\_  
Dr. Henry TenPas

The purpose of this research was to examine the relationship of two organizational variables, the type of instructional organizational structure and the administrative position level, to the job satisfactions of community college vocational administrators. Specifically, the purposes of this study were to examine the following questions:

1. Does the type of structure have an effect on the perceived need fulfillments or the degree of importance attached to the psychological needs of vocational administrators?
2. Is there a relationship between the administrative level and the perceived need fulfillments or the degree of importance attached to the psychological needs of vocational administrators?

## Procedures

The data for this study were obtained through the use of a questionnaire. The questionnaire utilized sixteen elements based on a Maslow-type need hierarchy system.

A total of 73 community colleges in four western states, California, Colorado, Oregon, and Washington, were selected for the study. The sample included 206 vocational education deans, directors, division chairman and department chairman. Upon return of the questionnaire, the data were statistically analyzed through the multi-analysis of variance technique.

## Conclusions

From the results of this study, the following conclusions are reported:

1. The type of community college instructional organizational structure does not appear to be an important organizational variable in determining the extent to which psychological needs are fulfilled.
2. The type of community college instructional organizational structure does not appear to be related to the degree of perceived importance assigned to the psychological needs.

3. The administrative position level does not appear to be related to the degree of perceived importance assigned to the psychological needs.
4. The administrative position level does not appear to be an important variable in determining the extent to which psychological needs are fulfilled.
5. Evidence was found to indicate that size of the institution may be an important variable in determining the degree to which perceived needs are fulfilled and the amount of importance assigned to the psychological needs.
6. All four levels of administrators tended to be similar in the relative ranks they assigned to the importance of the six different psychological need categories.

A Study of the Effects of Two Organizational Variables  
on the Perceived Need Satisfactions of Community  
College Vocational Administrators  
in Four Western States

by

Arnold Henry Heuchert

A THESIS

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## TABLE OF CONTENTS

<u>Chapter</u>		<u>Page</u>
I	INTRODUCTION	1
	Statement of the Problem	3
	Hypotheses of the Study	4
	Limitations of the Study	5
	Definition of Terms	6
	Importance of the Study	10
II	REVIEW OF RELATED LITERATURE	14
	Community College Structures	14
	Span of Control Concept	19
	Flat and Tall Organization Structures	25
	Maslow's Hierarchy of Personal Needs	30
III	DESIGN OF THE STUDY	36
	Design of the Instrument	36
	Selection of the Sample	41
	Collection of Data	42
	Analysis of Data	44
IV	PRESENTATION AND ANALYSIS OF DATA	47
	General Characteristics	47
	Relationship of Structure to Need Fulfillment	50
	Relationship of Structure to Need Importance	53
	Summary of Structure Hypotheses Testing	58
	Relationship of the Administrative Level to Need Deficiencies	61
	Relationship of the Administrative Level to Need Importance	67
	Summary of the Administrative Level Hypotheses Testing	73
V	SUMMARY, CONCLUSIONS AND IMPLICATIONS	74
	Summary of Findings	74
	Conclusions	77
	Implications	78
	BIBLIOGRAPHY	80

<u>Chapter</u>		<u>Page</u>
APPENDICES		
Appendix A.	Questionnaire	87
Appendix B.	Jury of Expert Revisions Form	93
Appendix C.	Participating Colleges	95
Appendix D.	Letter to Presidents	100
Appendix E.	Letter to Respondents	101
Appendix F.	Follow-up Letter	102
Appendix G.	Data Coding Procedures	103
Appendix H.	General Linear Hypothesis Program, Structure Effect	104
Appendix I.	General Linear Hypothesis Program, Level Effect	105
Appendix J.	Least Significant Different Table	106
Appendix K.	Least Significant Different Table	108



## LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	Distribution of N for Total Sample by Four Administrative Levels and Seven Age Groups, and Characteristics of Sample by Administrative Level	48
2	Distribution of N for Total Sample by Three Types of Organizational Structures and Three Size Groups	49
3	Distribution of N for Total Sample by Four Levels of Administration and Three Size Groups	49
4	Mean Need Fulfillment Deficiencies for Each Category and Item: Three Types of Structures by Three Size Classifications	51
5	Summary of Analysis of Variance Test: Mean Need Deficiencies for Each Category and Item	54
6	Mean Need Importance for Each Need Category and Item: Three Types of Structures by Three Size Classifications	56
7	Summary of Analysis of Variance Test for the Degree of Need Importance for Each Category and Item	59
8	Mean Need Deficiencies for Each Category and Item: Four Administrative Levels and Three Size Classifications	62
9	F-Test of Need Deficiencies for Each Category and Item: Four Administrative Levels and Three Size Classifications	65
10	Mean Need Importance for Each Category and Item: Four Administrative Levels and Three Size Classifications	68
11	F-Test of Need Importance for Each Category and Item: Four Administrative Levels and Three Size Classifications	70

## LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1	Organizational Variables	6
2	Organizational Structure A	8
3	Organizational Structure B	9
4	Organizational Structure C	10
5	Organization Chart	15
6	Organization Chart	16
7	Organization Chart	17
8	Illustrative Span of Control	21
9	The Hierarchy of Needs	33

A STUDY OF THE EFFECTS OF TWO ORGANIZATIONAL  
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TIONS OF COMMUNITY COLLEGE VOCATIONAL  
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I. INTRODUCTION

A good organization structure does not by itself produce good performance -- just as a good constitution does not guarantee great presidents, or good laws, or a moral society. But a poor organization structure makes good performance impossible, no matter how good the individual managers may be. To improve organization structure . . . will therefore always improve performance (20:225-226).

The unprecedented influx of students into community colleges following World War II brought with it many complicated problems of administration and coordination. Most colleges began as comparatively small schools. As such, it was unnecessary to pay close attention to the details of the internal organization since the president and one or two other administrators easily handled all problems which arose. But most institutions today are no longer small and simple organizations. Large faculties and large student bodies have brought into focus the problem of having a functional organization in which there is close and effective cooperation among administrators, faculty members, and supporting personnel for the purpose of providing students with an integrated educational experience.

Over the years, as organizations have grown and become more complex, theorists have researched organizational principles

attempting to determine what type of organizational structure would tend to create a potential for improving attitudes, more effective supervision, and greater individual responsibility and initiative among employees. Theorists such as Worthy, Meltzer and Salter, Porter and Lawler, Carzo and Yanouzas (78, 49, 64, 16) have worked on the problem in industrial settings by focusing considerable attention on the merits of "flat" organizational structures in comparison with "tall" structures.

These studies, however, have been conducted by researchers studying business and industrial organizations. Therefore, the question could be asked, "Do the findings of researchers studying business and industrial organizations generalize to educational organizations and community colleges in particular?"

Over the last twenty or more years, there has been an increasing number of theorists subscribing to the notion that while educational institutions may be unique, the administrative process - organizing, planning, coordinating, controlling, motivating, and evaluating - are not. For example, Simon (70) states that administration has a central commonality of processes. Carabillo (14:4), stressing commonality of administrative processes, maintains that "management science is generalizable to virtually any organizational environment, profit-making or otherwise." Campbell, being somewhat more specific in his comparison of education with business, contends that:

Whether one looks at administration from the standpoint of its purpose, its tasks, its situational milieu, or its processes, he will find much that is common in the management of business, government, education, and other organizations . . . . One might conclude that education is unique, but that administration of education is not. In practice, I find no way of making such a separation (13:166).

A theory is good only to the degree that it explains what actually occurs. Administrative processes may have little, if any, relation to organizational structure and job satisfactions. However, a discussion of the commonality claim for administrative processes is useful in illustrating the possibility that findings concerning organizational structures in business and industry may be applicable to educational institutions. Thus, it is hoped that research findings on organizational structure and need satisfactions among vocational education administrators will show some degree of commonality with similar research among administrators in other settings.

#### Statement of the Problem

This research will attempt to contribute to the community college administrative theory by investigating the relationship of two organizational variables, the type of community college instructional organizational structure and the administrative position level, to the job satisfactions of vocational education administrators. Specifically, the purposes of the study are to examine the following questions:

1. Does the type of structure have an effect on the perceived need fulfillment of vocational administrators?
2. Does the type of structure have an effect on the degree of importance attached to the various needs of vocational administrators?
3. Is there a relationship between the administrative level and the perceived need satisfactions of vocational administrators?
4. Is there a relationship between the administrative level and the degree of importance attached to the various needs?

#### Hypotheses of the Study

The questions stated in the statement of the problem were tested in the following series of null hypotheses:

1. The type of structure has no significant effect on the perceived need fulfillment of vocational administrators.
2. The type of structure has no significant effect on the degree of importance attached to the various needs of vocational administrators.
3. The administrative level has no significant effect on the perceived need fulfillment of vocational administrators.

4. The administrative level has no significant effect on the degree of importance attached to the various needs of vocational administrators.

#### Limitations of the Study

The following limitations were included in this study:

1. The population of this study was limited to single campus public community colleges in the States of California, Colorado, Oregon, and Washington.
2. It is recognized that in any administrative organization there are many interrelationships which effect the satisfactions of individuals. These interrelationships are illustrated in Figure 1 as adopted from Litterer (43:213).

This study, however, is limited to the study of the formal structure as contrasted to the informal by Yoder:

Formal organization is that pictured on the usual organizational charts. It is the structure formally established by managers, who define the tasks to be performed and assign responsibilities for their performance . . . . Informal organizations parallel these formal structures. They are associations that develop without the planning, leadership, or sponsorship of managers. Informal organizations create their own communication networks and status structures (79:98-99).

This study is limited, then, to the formal structure or the structure formally established by presidents, who define the tasks to be performed and assign responsibilities for their performance.

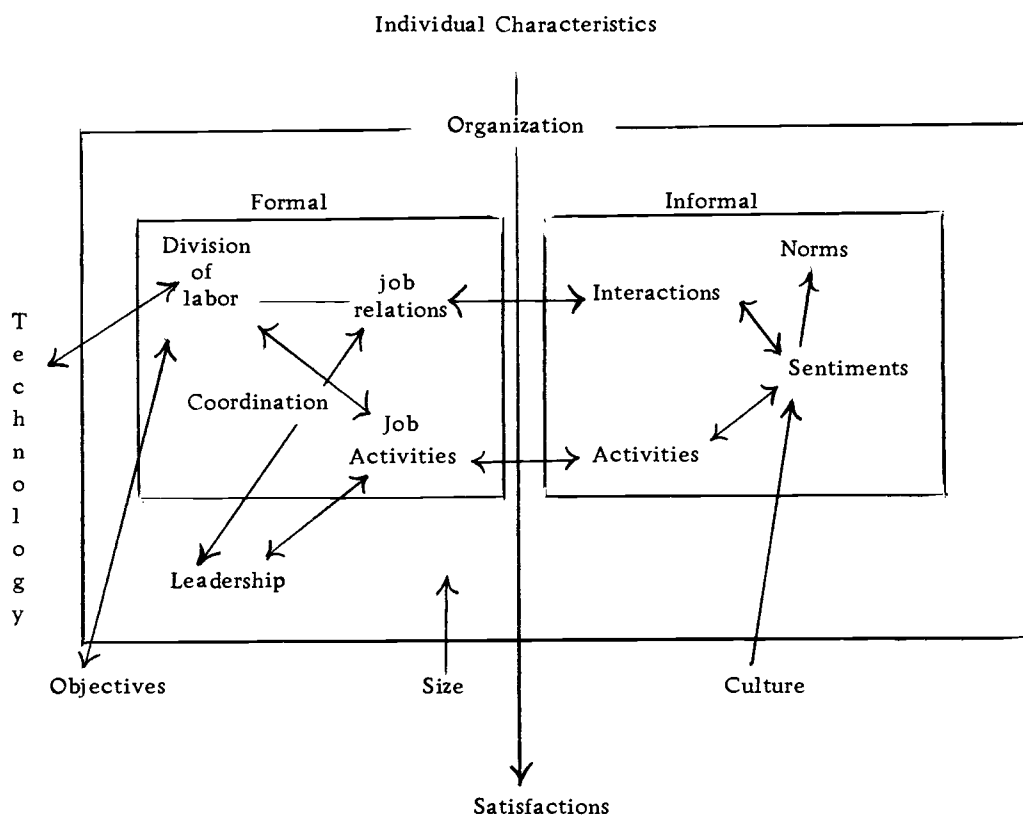


Figure 1. Organizational Variables

### Definition of Terms

The following definitions were included for the purpose of standardizing the use of terms in the study. Other terms or phrases used in the study were considered to be self-explanatory.

Community college is a two-year public institution of higher education with academic, vocational, and general education programs. It is designed to provide a wide range of options and services in response to the needs of the local community. For purposes of this study, no distinction is made among the junior college, the community



college, or the comprehensive community college.

Large size institution is a community college with a total full-time equivalent enrollment of more than 3,400 students.

Level I Administrator assists the college president by administering and supervising a part of the instructional program of the college assigned to him by the college president.

Level II Administrator assists Administrator I by administering and supervising a part of the instructional program.

Level III Administrator is responsible for supervising the instructors and programs of instruction within an assigned subject matter field.

Level IV Administrator assists Administrator III by supervising the instructors and program to which they are assigned.

Medium size institution is a community college with a total full-time equivalent enrollment between 1,200 students and 3,999 students.

Job satisfaction is a derivative term adopted from Porter (64) and defined as the extent to which rewards actually received meet or exceed the perceived equitable rewards. The greater failure of actual rewards to meet or exceed perceived equitable rewards, the more dissatisfied a person is considered to be in a given situation. Perceived equitable rewards have been defined by Porter as the amount of reward that a person feels is fair, given his performance on the task he has been asked to undertake by the organization (64:30).

Organizational structure, adapted from Knezevich (37), is a systematic way to differentiate and coordinate the relationships of two or more persons in a group or institution. This includes allocating authority and responsibility in a prescribed manner, establishing rules or procedures, determining patterns of communications, and in general subdividing the tasks necessary to the realization of the institutional purposes.

Small size institution is a community college with a total full-time equivalent enrollment of less than 1200 students.

Structure A is a community college instructional organizational structure characterized as having two or more parallel instructional administrators responsible for administering and supervising the instructional program of the college.

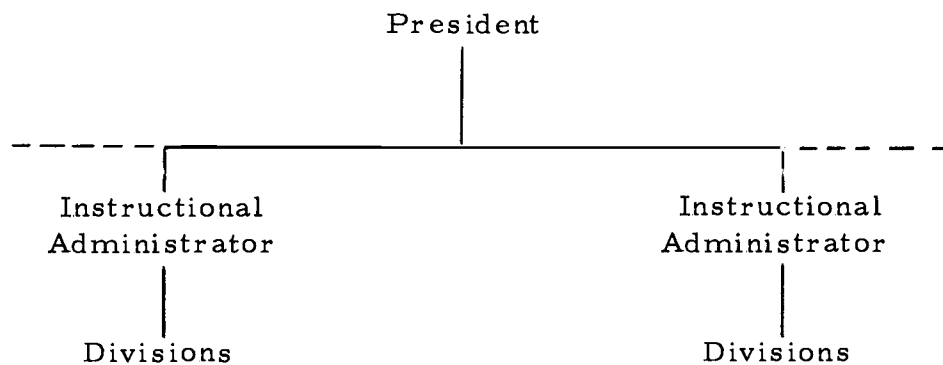


Figure 2. Organizational Structure A

Structure B is a community college instructional organizational structure characterized as having one instructional administrator

responsible to the president for administering and supervising the total instructional program of the college along with two or more Level II Administrators responsible for a part of the instructional program.

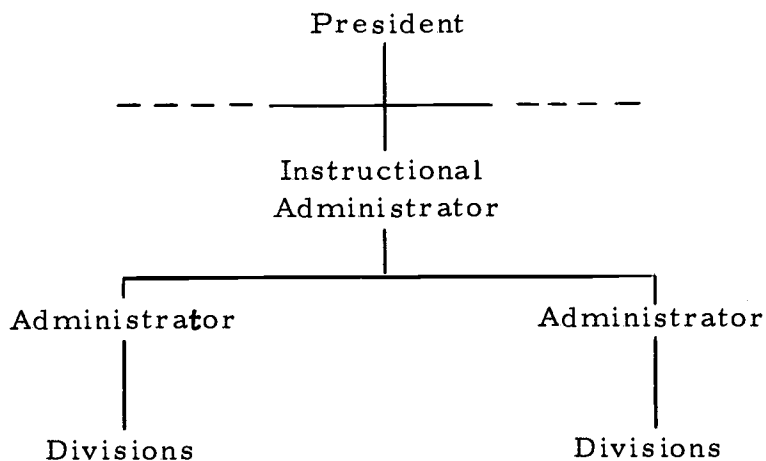


Figure 3. Organizational Structure B

Structure C is a community college instructional organizational structure characterized as having one instructional administrator responsible to the president for administering and supervising the total instructional program of the college along with one Level II Administrator responsible for administering the vocational education part of the instructional program.

Vocational administrator is any educational official responsible for the management or direction of the vocational education part of the instructional program; typically includes such officials as deans, associate deans, assistant deans, directors, and division chairmen.

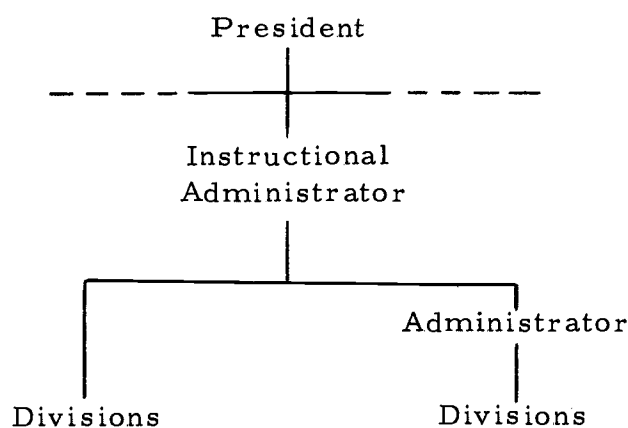


Figure 4. Organizational Structure C

Vocational education, as used in this study, is intended to encompass such terms as occupational education and technical education.

#### Importance of the Study

Within the short span of ten years, the total number of community colleges across the nation has expanded from 600 to 1,000 and has increased its enrollment from 660,000 to over 2,000,000 students (27:5). Their rapidity of growth, their rather favorable acceptance by the communities to whose needs they are relatively responsive, and the development of leadership from within their faculties have all aided in bringing into focus the problem of having a clearer understanding of the internal organization and its effects on individuals.

The internal organization or organizational structure of a community college defines an environment of formal rules, job descriptions, and communication networks in which people live during working hours. Newman, Summer, and Warren contend that:

This environment can satisfy needs or block them, it can develop good attitudes or bad attitudes, and it can, in part, determine what people think and learn. Therefore, structure -- as well as planning, face-to-face leadership, and control -- is highly important in getting results (53:203).

If administrators knew more about the organizational environment, its variables and how they affect performance and satisfactions of employees, organizational effectiveness might be increased.

Geotch, writing about the overall college and university internal organizational problems, has this to say:

The internal organization of colleges and universities seems to have developed out of the exigencies of the moment rather than from careful and long-range planning (28:7).

Somewhat like Goetch, Richardson recently raised the question as to "whether a science of administration may be said to exist with respect to the two-year colleges" (68:16). Richardson states:

I would tend to feel from personal observation that current practices represent a hodgepodge of ideas garnered from business, secondary schools, and four-year universities without the benefit of much analysis as to how well these ideas relate to the kinds of problems currently being encountered by the administrative organizations of two-year colleges (68:16).

Blocker, Plummer, and Richardson in their book, The Two-Year College: A Social Synthesis, (8) state that the administration of the community college would be improved if the conventional line-staff organizational plan were modified to place more direct emphasis upon the educational and personnel function of the college (8:177). Much like Worth's (78) nationally quoted study in business, Blocker, Plummer, and Richardson do not cite any empirical evidence to support their recommendations.

Earlier reputed writers in community college education have also dealt with this problem of organizational structure. For example, Eels outlined an organizational structure that placed all the administrative personnel directly responsible to the executive head of the institution (22:356). Bogue, another reputed early writer and former Executive Secretary of the American Association of Junior Colleges, outlined an organizational administrative structure which placed emphasis upon the academic and business management vice-presidents. This plan was drawn up by the Committee on Administration and Organization of the Junior College Association (9:19).

It appears from a review of the literature, that these variations in community college organizational structures have been adopted down through the years without the benefit of empirical research to determine the effects, if any, on the individual working within the community college organizational environment. Furthermore, a

review of community college literature for the past ten years reveals that only a few studies (51, 11, 57, and 72) deal empirically with the question of administrative concepts other than those relating to faculty or student involvement in administration of the college.

This study will attempt to contribute to community college administrative theory in several ways. First, it will provide additional information regarding whether or not findings on organizational structure and need satisfactions generalize across institutional boundaries. More specifically, it will provide information as to whether or not organizational structure research, among business and industry, generalizes to educational institutions. Secondly, it provides information on factors affecting administrative need satisfactions. In summary, these findings should enable us to understand better the conceptual relationship between man and his working environment.

## II. REVIEW OF RELATED LITERATURE

All community colleges are structured in the sense of having positions, levels, and parts which are systematically related to other positions and parts. Since community college organizations vary in their organizational structure, it is appropriate to examine the question of whether differences in structure of organizations are related to differences in satisfactions of individual members. The purpose of this chapter is to review the results of published literature relevant to such relationships in education and business organizations. Although this chapter is based on a rather extensive review of the literature of the past decade, no attempt will be made to cite all of the business and industrial articles that are relevant to the particular problem at hand. Instead, selected studies will be cited that are considered representative of the kinds of research being done.

### Community College Structures

For many years community college leaders have struggled with the problem of how a community college should be organized to best achieve the stated goals and at the same time provide a good working environment. This issue poses a dilemma to many administrators. Eels (22), an early community college authority, advocated an internal organizational structure which placed all the administrative



personnel directly responsible to the chief administrative officer of the institution. This structure is graphically illustrated in Figure 5.

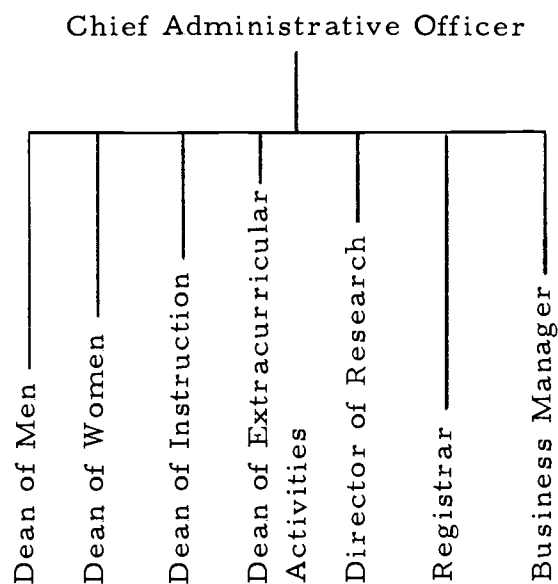


Figure 5. Organization Chart (22:356)

Later Bogue (9), one of the early Executive Secretaries of the American Association of Junior Colleges, suggested a refinement to Eels' idea by emphasizing a middle-level of administration which included an academic and business management vice-president. This plan was drawn up by the Committee on Administrative Organization of the Association (9:19).

Over the years both Eels' and Bogue's recommended organizational structures have evolved into what Blocker, Plummer, and Richardson (8) define as the conventional line-staff organizational structure of the two-year college. This structure, illustrated

graphically in Figure 6, makes three individuals, the academic dean, the dean of students, and the business manager, responsible for three discrete areas or functions.

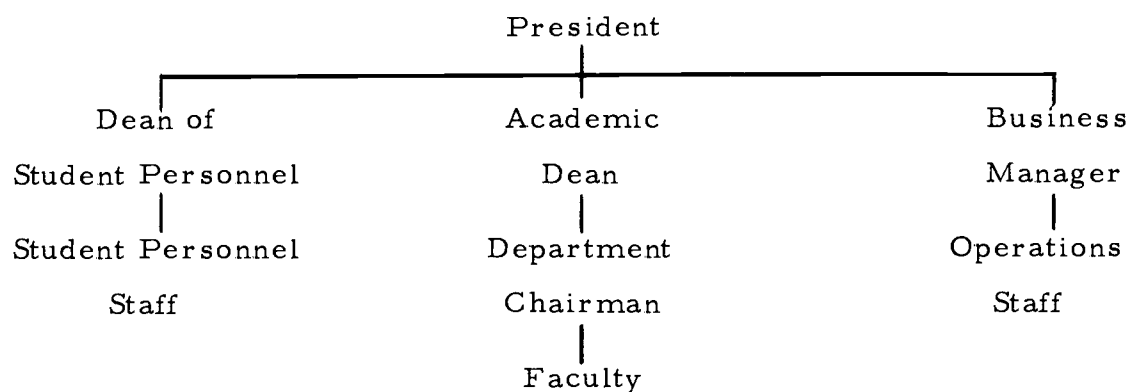


Figure 6. Organization Chart (8:177)

The success of this organization depends as much upon the horizontal coordination and cooperation as it does upon the vertical implementation of delegated authority and responsibility. Under this structure, the academic dean and the dean of students are given the prime responsibility of seeing that the primary functions of the college are achieved.

In a recent article Richard C. Richardson (68), who has been a leading community college critic of the present two-year college organizational structure, proposes an organizational structure which is a modification of the earlier traditional structures. Building on what Richardson terms Taylor's functional approach to administration, he recommends the internal structure presented in Figure 7.

--- Lines of Communication and Policy Formulation  
 — Lines of Administration and Responsibility

1 Administrative Staff  
 2 Administrative Council  
 3 Council of Deans and Division Chairmen

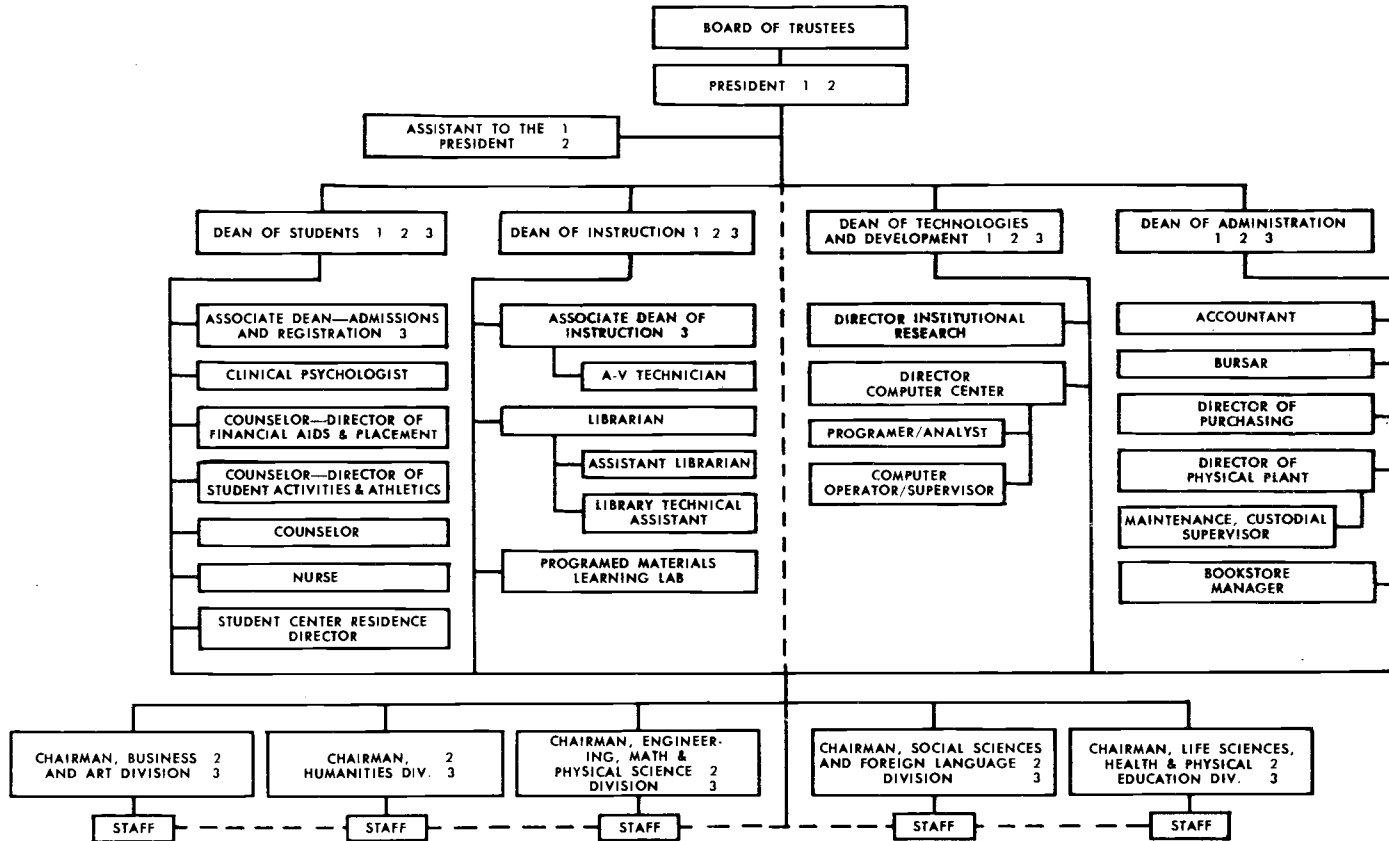


Figure 7. Organization Chart (68:21)

Richardson outlines the distinguishing characteristics of this form of organization structure as follows:

1. The second echelon of the organization violates the principle of unity of command in order to provide equal status to the four second-echelon administrators. In effect, each second-echelon administrator has direct access to division chairmen with respect to those responsibilities which are spelled out in his job description. No single second-echelon administrator can establish priorities independent of concurrence of the other second-echelon administrators. If there is a disagreement concerning priorities, these are worked out within the administrative staff or the administrative council;
2. Division chairmen are appointed to consultation with members of the division and receive released time but no additional remuneration. Division chairmen come up for review every three years and must be acceptable both to the administration and the members of their division in order to continue in office. This requirement tends to reduce the possibility of a division chairman becoming so entrenched that it becomes impossible to promote change within the division;
3. Division chairmen and faculty have a direct line of communication to the president which can be used for resolution of problems but cannot become a routine channel for solving of administrative matters that have been delegated to deans;
4. The responsibilities of the division are so defined as to make it clear that the members of each division are responsible for participating in the total program of educational services of the institution . . . (68:22).

Richardson goes on to list three significant advantages in this approach to community college administrative structure:

1. The focus for the professional staff of the institution is upon problem solving as opposed to coordination;
2. The number of levels within the structure are kept to the minimum necessary for the achievement of that coordination essential to effective operation of the institution;
3. There is no individual who is in a position to block the development of ideas that may emanate at any level (68:22).

Although Richardson, like Eels and Bogue, published no empirical evidence to support his model, his opinions are frequently cited to support the idea that "flat" organizational structures produce better performance than the traditional "tall" organizational structures. Advocates of this type of structure claim that because of the larger span of control, subordinates will have greater freedom and autonomy to make decisions. As a result of this greater autonomy and freedom, individuals are supposed to contribute more to the organization and in turn receive greater need satisfaction.

#### Span of Control Concept

At the base of the issues presented by Richardson, Eels, and Bogue, concerning what should be the shape of the organizational structure, is the span of control principle. Since early days, writers have prescribed what they felt to be an optimum span of control. The Bible describes how Moses had problems with this time-honored principle:

. . . Moses sat to judge the people, and the people stood about Moses from morning till evening. When Moses' father-in-law saw all that he was doing for the people, he said . . . "What you are doing is not good. You and the people with you will wear yourself out; for the thing is too heavy for you; you are not able to perform it alone . . . ."

So Moses gave heed to the voice of his father-in-law and did all that he had said. Moses chose able men out of all Israel and made them heads over the people, rulers of thousands, of hundreds, of fifties, and of tens, and they judged the people at all times; hard cases they brought to Moses, but any small matter they decided themselves (5:17-26).

Somewhat like Moses, many present day community college administrators are faced with a similar dilemma. With rising enrollments, larger faculties, and expanded facilities, the question arises as to whether some present administrator can take on the effective supervision of the enlargement and still perform his duties satisfactorily. If it is decided that a new administrator should be added, then what administrator has time and the capacity to direct this new person's activities?

This issue poses a dilemma to many administrators. If a president desires a small span of instructional administration, then the number of administrators and probably the number of levels of supervision between the president and the certified employees will have to be increased. On the other hand, if the president desires to keep the number of administrators small, there will have to be an offsetting

increase somewhere in the number of individuals reporting to lower level administrators.

This dilemma is illustrated in Figure 8 as adopted from Haimann (32) and Newman (52).

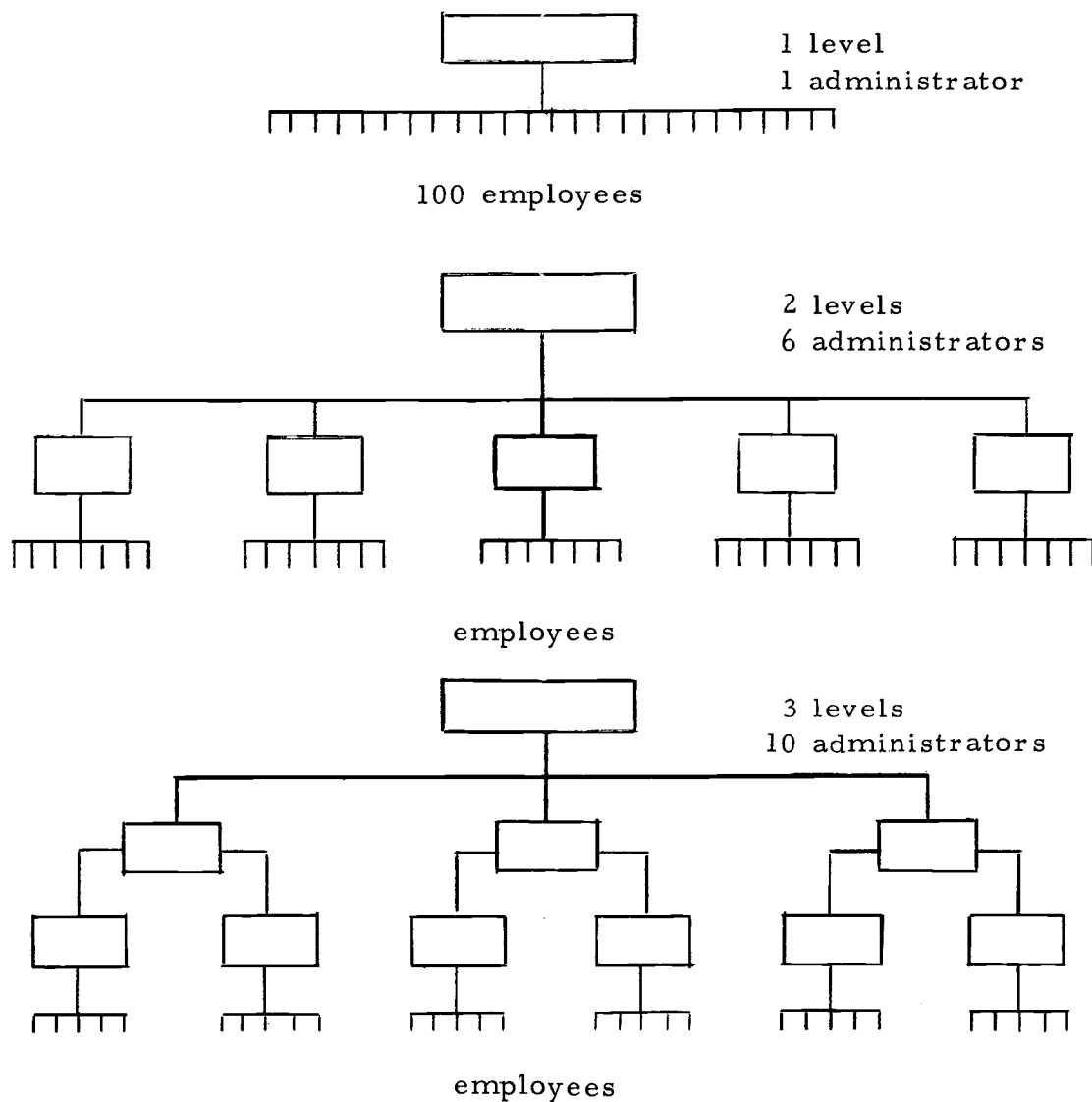


Figure 8. Illustrative Span of Control

Theoretically, one administrator could supervise all 100 employees, but the average time spent with each would be too limited for the administrator to give effective supervision. If the administrator decided he could keep track of five assistants, and that each of these middle level administrators could keep track of 20 employees, then one would have the situation shown in the middle diagram of Figure 8. Now assume that 20 subordinates are too many for the middle level administrator, this figure could be reduced by adding another level of administration, thus reducing the span at the lower level to 15 subordinates. The span of management has thus been reduced to a much narrower number instead of the original 100.

This is an example, but it illustrates what happens when one begins to narrow the span of management. It is obvious that the narrower the span of management, the more levels of administration are needed. The organization will either end up as a very shallow, "flat," broad, pyramid structure, as the first illustration in Figure 8, having a span of 100 subordinates, or as a "tall" pyramid structure, represented by the last illustration in Figure 8. This is what is meant by the terms "flat organizational structure" and "tall organizational structure." At the root of all this is the principle of "span of management" or "span of control" concept.

The span of control concept is defined as the number of subordinates an administrator is responsible for supervising. Early



writers have prescribed what they felt to be an optimum span of supervision. One of the first persons to direct public attention to the principle of span of control was a military man, General Ian Hamilton (33). Hamilton states, "The average human brain finds its effective scope in handling from three to six other brains" (33:142). Others having a similar belief were such theorists as V. A. Graicunas (30) and Urwick (75). In most instances, these theorists have assumed that a small span of control (three to six) is a good principle for an organization to follow.

Many modern theorists take an exception with this limited span of control principle. Newman (52), Haimann (32), and Knezevich (37), for example, indicate that there are six basic variables which influence the number involved in an effective span of control. These variables are:

1. The time available for such supervision. It follows that the longer period the administrator is willing and able to devote to his job, the larger his span of supervision;
2. The mental capacity and personal adaptability of the administrator responsible for supervision. There are individual differences. These differences help to explain in part why effective span of supervision for various administrators will vary;
3. The complexity of the situation being supervised. A single situation with a number of employees doing fundamentally the same things will enable an executive to supervise a larger number of personnel than otherwise. On the other hand, if the administrator is responsible for many unrelated activities, he will be able to supervise effectively a far smaller span of positions;

4. The other duties of the executive. If the administrator is to be responsible for general planning and control of the institution as well as supervision of a number of other administrators, his effective span will be far smaller than that for an individual of similar ability and experience who does not have these added responsibilities;
5. The stability of operations. The greater the turnover among the teaching or administrative staff, the more difficult it becomes to supervise effectively a larger span of operations;
6. The capability and experience of subordinates. The more capable, the better prepared professionally, and the greater the experience of administrators and instructors, the relatively easier it becomes to supervise larger numbers. This would imply that as administrators and instructors become more capable through greater professional preparation and experience, the larger would be the effective span of supervision (37:67-68).

Another earlier theorist who took exception to a limited span of control was James C. Worthy (78). Worthy suggested that a large span of control is good since it provides better communication and greater individual growth and initiative (78:179). With this statement and statements of others, the debate lines have been drawn. The lack of research makes it hard to state that any particular span of control is best for producing high performance or high job satisfaction. What data there are has been researched under the area of "tall" versus "flat" types of organization structures with implications generalized back to the span of control principle.

An exception to this would be a study by Entwisle and Walton (24). Entwisle and Walton conducted a study to determine if there

was a relationship between the span of control found in business and in education. Their study of twenty colleges, twenty small businesses, and twenty automotive dealers indicated that size of spans are similar and there is a small positive correlation between size of organization and the span of control.

The type of span adopted by any particular administrator will influence the shape of that particular organization. Generally, "tall" or "flat" organization structures are distinguished on the basis of the number of levels in the organization relative to the total size of the organization. Beginning with Worthy in 1950, attention has been focused on the relative merits of these two types of structures.

#### "Flat" and "Tall" Organizational Structure

Worthy's study (78) of Sears Roebuck and Company in the early 50's was one of the first extensive and widely accepted empirical studies on the effects of "flat" and "tall" organizational structures.

Worthy's basic conclusion was:

Flatter, less complex structures, with a maximum of administrative decentralization, tend to create a potential for improved attitudes, more effective supervision, and greater individual responsibility and initiative among employees. Moreover, arrangements of this type encourage the development of individual self-expression and creativity which are so necessary to the personal satisfaction of employees and which are an essential ingredient to the democratic way of life (78:179).

It is interesting to note that despite the fact that no empirical evidence was produced to back up his study, and although his observations were based upon experiences with a single organization, his views have been frequently quoted in the literature to support various authors' views that "flat" organizations produce higher performance and satisfactions than "tall" ones. These views are in direct opposition to those set forth by Hamilton (33), Graicunas (30), and Urwick (75), who argue that a "tall" structure improves performance by allowing for better communication and supervision.

During the last ten years several studies have compared the job satisfactions of individuals in "tall" organizations with those in "flat" organizations. Meltzer and Salter (48), for example, after studying 704 physiological scientists working in non-academic organizations in the United States, had serious doubts about the negative relationship between the number of organizational levels and productivity as stated by Worthy (78). Their study did not find any significant relationship between "tallness" or "flatness" on job satisfactions, when size was controlled. However, it should be noted that Meltzer and Salter studied research organizations of extremely small size, different from Worthy, and hence their findings may have limited generality.

Two years later, Porter and Lawler (65) studied the effects of "tall" and "flat" organizations on the job satisfactions of 1500

American managers and found that the effects of "tall" or "flat" structures are not as simple or unequivocal as Worthy seemed to imply. They found that size was an important interacting variable. In small organizations, managerial satisfactions were greater in "flat" rather than in "tall" organizations. However, in large organizations, the reverse is true with a "tall" type of structure producing perceptions of greater need satisfactions. A "tall" structure was associated with greater satisfactions in the security and social need areas, whereas a "flat" structure was associated with greater satisfaction in the self-actualization need area.

This study, like Meltzer and Salter (48), may have limited generality. No attempt was made to limit the sample population to one type of industrial organization.

One year later, Porter and Siegal (66) repeated the earlier Porter and Lawler study using a different population, foreign managers. They found an interactive effect between need satisfaction and "flat" versus "tall" organizational structure with organizational size. In smaller "flat" organizations, managers were found to have greater need satisfaction than did those in "tall" organizations, and the reverse held with managers in large organizations.

Generally, similar results were obtained by ElSalmi and Cummings (23). They studied the organizational interaction variables of 425 managers in relationship to the manager's perception of needs

and need satisfactions. The organizational variables were organizational size, structure, and authority position (line versus staff). The study indicated that at top levels of management, "taller" structures produce significantly less need fulfillment deficiencies than both "flat" and "intermediate" structures. However, the reverse was found at lower levels of management. This latter finding would tend to support Worthy's views that "flatter" organization structures are more conducive to higher employee morale and greater job satisfaction. ElSalmi and Cummings (23) found the greatest differences in need deficiencies between "tall" and "flat" structures occurred in the areas of security needs (protection against feeling of being fired), social needs (opportunity to give help to others and to develop close friendship within the organization), and autonomy (the opportunity for self-government, self-control, and self-determination).

A somewhat more controversial piece of research was conducted by Carzo and Yanouzas (16). They conducted a laboratory experiment designed to test the effects of the "tall" and "flat" organizational structures on group performance. Comparisons of performance on the amount of time taken to complete decisions showed no significant difference between "tall" organizational structures and "flat" organizational structures. Carzo and Yanouzas attributed the results to counteracting forces in the "flat" structure and to the elimination of some of the barriers to communication in the "tall" structure.

The empirical findings of Ghiselli and Johnson (26) support to some extent the earlier conclusions of Worthy's in that "flat" organizations are superior to "tall" ones in encouraging individuality. They state:

It appears to be the case that it is the satisfactions of those needs which are of an individualistic sort, the need for autonomy and for self-actualization, which are more highly related to managerial success in flat than in tall organizations, whereas those needs which pertain to protection and reassurance, such as the need for security, are no more related to the success of managers in the one or the other type of organization, and indeed, are not greatly related to success in either (26:574).

Overall, the empirical evidence from all of the studies does not support or confirm the long held belief that "flat" type organizations are universally superior to "tall" type organizations. Paul R. Lawrence and Jay W. Lorsch (41) take the point of view that, "There is no one best way to organize, but that different companies in different industries require different kinds of organization structures at different stages in their growth" (41:177).

To summarize briefly at this point, the lack of research makes it impossible to state that any particular span of control or organizational structure is best for producing high performance or positive satisfactions. What data there are suggests that there is no one ideal span of control or structure for all organizations. The type of span of control adopted is dependent upon many organizational variables.

The research concerning "tall" versus "flat" organizational structures does not support Worthy's (78) contention that a "flat" organization structure produces greater job satisfaction and improved job performance. The evidence points to other organizational variables as affecting the relative advantages of "tall" and "flat" structures. Furthermore, there is still the question as to whether the findings in business organizations are generalizable to educational institutions.

Turning now to the "dependent" variable, need satisfaction, and need importance, the section which follows will review Maslow's hierarchy of personal needs theory. The concepts of Maslow's are of great significance to the college administrator because they provide him with one base for understanding the personal needs of individual staff members.

#### Maslow's Hierarchy of Personal Needs

It is becoming even more apparent that administrators, in order to design an organization which will keep moving toward the fulfillment of its goals, will have to place a greater emphasis on the creation and maintenance of an organizational environment in which individuals can make a contribution to the organization that is satisfying to himself. In order to accomplish this end, the administrator must operate from some type of theory base which will help him to recognize and



understand the various psychological needs of each staff member. Therefore, a knowledge of the motivational concepts formulated by Maslow (46) and modified by Porter (52) will provide the administrator with one type of valuable theoretical foundation.

Maslow's theory suggests that there are five basic needs and these needs can be arranged in a hierarchy of prepotency. His theory can be classified into five categories or classes as follows:

1. Physiological needs: this category includes the lowest and most basic physical needs of survival--food, clothing, and housing are illustrative.
2. Security and safety needs: these are second order needs which include protection against the hazards of the environment.
3. Social needs: third order needs which include the need for companionship, the opportunity to associate with, help, and be helped by others.
4. Esteem needs: the need of a stable, firm based self-evaluation as well as the need to be accepted by one's peers.
5. Self-actualization, self-expression, self-fulfillment: this is the fifth level need which is composed of the drive to exercise highest attitudes and capabilities; the need to achieve one's full capacity for doing (72:82).

Maslow points out that an individual is never without a need of some type, and that the appearance of any particular need occurs upon the satisfaction of the one which immediately precedes it on the hierarchy. For example, when the physiological needs are no longer felt by a person, the next level of need, safety and security, emerges to occupy the individual's attention. After these two basic needs are fulfilled, the remaining three levels--social, esteem, self-actualization--become of consequence in that order to the individual. When a particular need is fulfilled in whole or in part, it tends to fade into the background as a motivator of individual behavior. As a need becomes of less importance to the individual, it is replaced wholly or partially by the next category or level of basic needs on the hierarchy.

Maslow has pointed out that the hierarchy of needs is not rigid. He suggests for an example that self-esteem seems to be of more importance than love or security for some people, self-actualization appears to be of greater consequence than some of the more basic needs to certain innately creative individuals, and some persons are satisfied with fulfillment of more prepotent needs and never experience those that ordinarily follow.

Null (55) identified two important concepts in the hierarchy of needs' theory. They are: (1) a man's needs can be satisfied directly through satisfactions that arise on the job and indirectly through off-the-job satisfactions; (2) a satisfied need, in many cases, ceases to

motivate. If this is true, then it becomes clear that many incentives offered by organizations to motivate individual behavior must be examined in light of the findings based upon Maslow's hierarchy.

Beginning with Maslow's theory as a base, Porter and others modified the basic theory and developed an instrument, which was used in the previous quoted studies, designed to measure individual satisfactions. Figure 9 is Porter's revision of the Maslow categories of hierarchical relationships which constitute a theory of human needs.

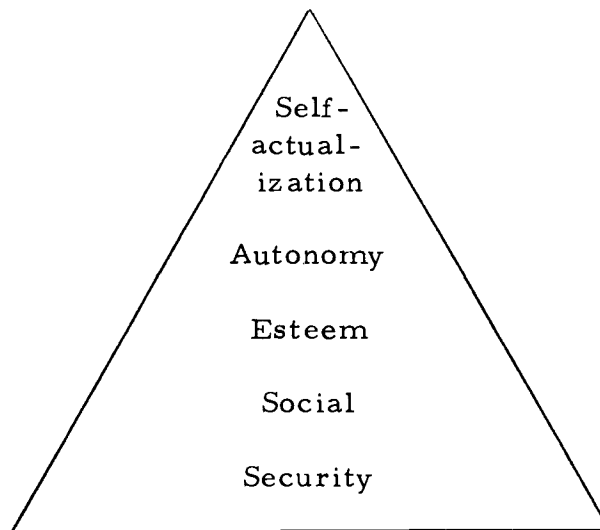


Figure 9. The Hierarchy of Needs (70:135)

Applying Porter's concept to educational administration, Sergiovanni and Starratt (70) stated that lower-order needs (security, social, and to some extent, esteem) have limited motivational potential for education. However, the reverse is true for the higher-order needs (esteem, autonomy, and self-actualization). The higher-order needs have unlimited motivational potential for educators according to Sergiovanni and Starratt (70:134).

Brown (10), using a Maslow-Porter instrument, studied the need satisfactions of educational administrators. He examined the relations between ten variables and administrator need satisfactions. Of the ten, three indicated a significant relationship to need satisfaction and eight did not. These variables found to have a significant relationship to need satisfaction were: (1) job level, (2) education, and (3) minority student composition. The other seven variables found not to be related were: community setting, line-staff position, job-site, age, sex, ethnicity, and organizational size. The sample for this study included 755 secondary educational administrators from all levels.

Using a Herzberg concept, Dahl (19) researched the job satisfaction of junior college middle- and lower-middle administrators or eight junior colleges in Southern California. The general findings of this study indicated that job satisfaction among administrators was found to be very high and there existed a close relationship between satisfaction and age. In his conclusions, he recommended that a study be undertaken utilizing the Maslow-Porter concept.

In summary, the literature reviewed in this chapter presents an amalgamation of the many important aspects which are interrelated with reference to organizational structure and individual performance or satisfactions. The Maslow hierarchy of need concept, as modified by Porter, provides one means of ascertaining the effects of an

organization and its environment in relation to individual performance. Furthermore, this theory can be of significance to an administrator because it will provide him with one base for understanding human behavior. The educational literature related to this area is very limited.

### III. DESIGN OF THE STUDY

This research is an empirical investigation of the relationship between the community college organizational structure and the perceived need satisfactions of lower- and middle-level vocational administrators with the hope that the findings will enable others to understand better the conceptual relationship between man and his working environment. The following summary of procedures employed in the study is provided to delineate the specific steps taken during the investigation.

#### Design of the Instrument

This research makes use of a modified University of California Management Position Questionnaire. The basic questionnaire is the work of Professor Lyman W. Porter, Professor of Psychology and Administration, University of California at Irvine.

There are two parts to the questionnaire: (1) need satisfaction questions, and (2) questions seeking demographic information. The first part measures need satisfactions by making use of a Likert-type rating scale. The respondents were asked to rate themselves on a scale that ranges from one to seven. The questionnaire contains 16 items designed to provide information about five psychological need categories. The second part of the questionnaire attempted to seek demographic information.

The categories of needs studied in this research, along with specific items used to obtain information relevant to each category, are presented below:

I. Security needs

1. The feeling of security in my position

II. Social needs

1. The opportunity, in my position, to give help to other people
2. The opportunity, in my position, to develop close friendship

III. Esteem needs

1. The feeling of self-esteem a person gets from being in my position
2. The prestige of my administrative position inside the college
3. The prestige of my position outside the college
4. The opportunity, in my position, to achieve professional status and recognition from professional peers outside of the organization

IV. Autonomy needs

1. The authority connected with my position
2. The opportunity for independent thought and action in my position
3. The opportunity, in my position, for participation in the setting of goals
4. The opportunity, in my position, for participation in the determination of methods and procedures

V. Self-actualization needs

1. The opportunity for personal growth and development in my position
2. The feeling of self-fulfillment a person gets from being in my position
3. The feeling of worthwhile accomplishment in my position

VI. Items specific to two or more need categories:

1. The pay for my position
2. The feeling of being in-the-know in my position

The above items were arranged randomly in the questionnaire (see Appendix A), but are here listed systematically according to their respective need categories. The categories, which are in general agreement with the classification system used by Maslow (46), are arranged in approximate hierarchical order from lowest-order (most prepotent) to highest order (least prepotent).

There are two major deviations from Maslow's basic classification system. First, the questionnaire did not contain any items relating to the most prepotent needs--physiological needs--since these needs are presumably so adequately satisfied for any professional educator that questions concerning them would appear irrelevant and unnecessary to the respondent. The second major deviation from Maslow's system, made by Porter (59) in designing this instrument,



is the addition of an "autonomy" category. Porter gives the following rationale for this change:

The items included under this category or autonomy are ones that in Maslow's system would be included in the "esteem" category; here, however, these items have been put into a separate category since it seemed that they are logically distinct from other items that are more commonly associated with the term "esteem." Therefore, the autonomy items have been inserted in the hierarchical order of needs between the esteem category and the self-actualization category . . . to which they have some relation (59:2).

Items VI-1 and VI-2 have been included and listed separately because they seem to be relevant to two or more categories. Based upon the research of Gouldner (50), item III-4 was also added because it was believed that it was important to this type of study.

The dependent variable in the study was a score assigned by respondents in the sample to denote the level of importance that they felt was necessary for each of the items under the five categories. Respondents, which included community college deans, assistant deans, associate deans, supervisors, directors, coordinators, division chairmen, and department chairmen of vocational education, were asked to evaluate the importance of each item in relation to their job. Each of the items was assigned a score based upon the following Likert-type scale:

- a. How much of the characteristic is there now connected with your position?

(Minimum) 1 2 3 4 5 6 7 (Maximum)

- b. How much of the characteristic do you think should there be connected with your position?

(Minimum) 1 2 3 4 5 6 7 (Maximum)

- c. How important is this position characteristic to you?

(Minimum) 1 2 3 4 5 6 7 (Maximum)

The instrument developed by Porter (52) provided the base for the development of the administrative need satisfaction questionnaire used in this study. The format was revised and made more suitable to the community college level needs. Each item was checked to determine its appropriateness to community college administrators. Part I of the revised questionnaire contained 16 items.

The second step in the development of the questionnaire was to present the questionnaire to a jury of experts for the purpose of evaluating it in relation to format, content, clarity, and understanding. The composition of this committee included six community college vocational administrators from three levels of administration in California, Colorado, Oregon, and Washington. The members were initially contacted by telephone and the instrument and a letter were forwarded at a later date. The revision form used by the jury of experts is found in Appendix B. Several of the items were revised for clarity. The final instrument used in the study is found in Appendix A.

### Selection of the Sample

The study's population utilized the four Western States of California, Colorado, Oregon, and Washington. The relatively recent emergence of the community college movement in the United States, particularly in the western states, necessitated the careful selection of the states which had comprehensive community colleges with multi-purpose curriculum offerings. Two criteria were considered in the selection of the states: first, the community colleges in the state must offer both transfer and non-transfer (vocational) instructional programs; secondly, the states must have community colleges of the urban (large size), suburban (medium size), and rural (small size) types. The four states selected met these requirements. Appendix C gives the names of the community colleges which participated in the study.

The sample for the study consisted of 206 randomly selected community college vocational administrators. The names of these educational administrators were obtained from the following sources:

1. In California, participating institutions were asked to provide rosters, college directories, or college catalogs.
2. In Colorado, the Colorado Directory of Teachers of Occupational Education prepared by the State Board for Community College and Occupational Education was used.
3. In Oregon, names were secured from the Directory of Personnel in Oregon Community Colleges published by the Oregon Community College Association.

4. In Washington, the Vocational Education Directory prepared and published by the Coordinating Council for Occupational Education of the Washington Division of Vocational Education provided some names for the selection of respondents, along with individual college staff rosters, college directories, or college catalogs.

#### Collection of Data

Several steps were involved in the collection of data in each of the four western states. Because of the implications this study could have for leadership development in community college education, the Division of Vocational, Adult, and Community College Education, Oregon State University, was asked to provide Division support in the securing of appropriate agency and community college participation in each state.

A letter was sent to 92 community college presidents in the four western states asking if they would allow this investigator to contact vocational administrators in their institution. A sample copy of the letter sent to the presidents is found in Appendix D.

Enclosed with the letter to the presidents was a copy of the need satisfaction questionnaire and a president's response card which was to be completed and returned to the investigator. The response card asked each president to indicate whether or not he was willing to support the study and to identify a contact person in the community college with whom the investigator could direct further communications.

Seventy-three presidents, of 92 identified, granted permission to have their institution participate in this study.

Data were collected by mailing a self-addressed, stamped, questionnaire and explanatory letter to vocational administrators in each of the participating institutions. All data were collected Winter term of the 1971-1972 academic year. A copy of the explanatory letter sent all respondents is found in Appendix E.

Two methods of follow-up were used. Administrators who did not respond by the date requested were first sent an additional questionnaire and a letter requesting their response. A second letter was sent to those administrators still not responding. A copy of the follow-up letter is found in Appendix F.

Upon the return of the completed questionnaire, each questionnaire was classified into one of the three types of organizational structures. Two hundred and eleven questionnaires, 62 percent, were returned to the investigator. Of the 211 questionnaires, only 206 were usable. The others were rejected because of incompleteness.

The final step in the treatment of the questionnaire was to transfer the information to data processing cards for computer analysis. The method for coding cards is outlined in Appendix G.

### Analysis of Data

Once the data for use in this study had been collected, categorized, and coded, the following steps were undertaken for analysis of the data:

1. Upon the selection of the questionnaires, the data from the questionnaires were coded and key punched on IBM cards for electronic computer analysis using the CDC 3300 computer at the Oregon State University Computer Center.
2. The data were analyzed according to the following plan:
  - a. The degree of perceived deficiency in need fulfillment for each respondent on each questionnaire item was obtained in the same manner as in Porter's (59) study. The procedure is as follows: Part (a) of an item ("How much of the characteristic is there now connected with your position?") was subtracted from part (b) of the item ("How much of the characteristic do you think should be connected with your position?"). Like the Porter study, a prior assumption was made that the smaller the difference--(a) subtracted from (b)--the smaller the degree of dissatisfaction or the larger the degree of satisfaction. This method is an indirect measure of perceived need satisfaction derived from two direct answers by the respondent for each item. In

effect, this method asks the respondent, "How satisfied are you in terms of what you expected from this particular administrative position."

Negative discrepancy scores for the purpose of this study were treated as to mean the respondent was satisfied. This occurred when the respondent rated his actual need fulfillment (a) ("How much is there now?") higher than his ideal degree of need fulfillment (b) ("How much ought there to be ideally?"). An example is if a person rates his actual need fulfillment 7 and his ideal fulfillment 2. Subtracting (a) from (b) would give a negative score of 5. It is hard to interpret the psychological meaning of such a score, but in this investigation it was regarded as denoting high satisfaction, or the individual's job provides more satisfaction than he thinks it ought to. In the few cases where this did occur, the score was treated as "0", meaning satisfied, whereas + 7 means highly dissatisfied.

b. Significance tests were conducted using the unequal cell multi-analysis of variance program with the F statistic to test the four hypotheses stated in Chapter I. A sample of the general linear hypothesis program used to test the structure effect is found in Appendix H. Appendix I illustrates a sample of the general linear hypothesis program used to test the level effect.

c. The critical level of significance was set at  $\alpha = .01\%$ . The Least Significant Difference Test (LSD) was used to determine where specific differences existed between means which were rejected by the analysis of variance.



#### IV. PRESENTATION AND ANALYSIS OF DATA

This chapter presents the findings of the four hypothesis cited in Chapter I. The chapter is divided into two major areas. The first part presents the general characteristics of the population followed by data used to test the four null hypothesis. Chapter III contained the detailed procedure and statistical techniques used to conduct the study.

##### General Characteristics

Table 1 illustrates the general characteristics of the total sample by four administrative levels and seven age groups along with other characteristics of the sample in relation to administrative levels. The table indicates that the majority of the respondents are in the age range of 35 to 59. The mean college degree for the total sample was 3.9 which would be equal to a B. A. +. The mean for the years with the college, for the total N, was 4 to 5 years and the mean for the years in the position, for the total N, was 5.1 which is equal to 3 to 4 years. This data was presented for the purpose of describing the population only. It was not utilized in the analysis of the perceived need fulfillment or the degree of importance of the psychological needs of vocational administrators.

Table 1. Distribution of N for Total Sample by Four Administrative Levels and Seven Age Groups, and Characteristics of Sample by Administrative Level.

Adminis- trative level	Total N by Age Group						Total N by level	College Degree*	Years with college	Years in position
	25-29	30-34	35-39	40-49	50-59	60+				
1	1			2	5	1	9	BA+	4-5	3-4
2	2	5	19	33	22	5	86	MA	4-5	2-3
3		9	9	35	22	10	85	BA+	4-5	2-3
4			5	15	4	2	26	MA	4-5	3-4

\*Equated from computed mean scores.

Table 2 presents the number of respondents coming from the community colleges with each type of organization structure within each college size group. This table can be referred to in determining the N's for the subgroups of subjects in Table 4 and Table 5.

Table 2. Distribution of N for Total Sample by Three Types of Organizational Structures and Three Size Groups.

Organizational structure	Size groups			Total N for structure type
	Small	Medium	Large	
Structure A	6	13	9	28
Structure B	2	8	60	70
Structure C	35	48	25	108
Total N for size	43	69	94	206

Table 3 classifies the 206 respondents by administrative level and subgroup size. This table can be referred to in determining the N's for the subgroups of subjects in Table 7 and Table 9.

Table 3. Distribution of N for Total Sample by Four Levels of Administration and Three Size Groups.

Administrative Level	Size groups			Total N for level type
	Small	Medium	Large	
Level I	3	2	4	9
Level II	16	32	38	86
Level III	15	29	41	85
Level IV	9	6	11	26
Total N for size	43	69	94	206

Relationship of Structure to Need Fulfillment

Table 4 presents the mean need fulfillment deficiencies for each of the sixteen items in the questionnaire by each subgroup of respondents. The basic data for this table were obtained by calculating for each respondent for each questionnaire item, whether the individual checked a higher scale number for Part b of the item (How much of the characteristic do you think should be connected with your position?) than for Part a of the item (How much of the characteristic is there now connected with your position?). Whenever Part b was checked higher than Part a, this was termed a "deficiency" in need fulfillment. Whenever Part a was checked higher than Part b, this was termed a "satisfied" need.

Examination of Table 4 shows the following trends: first, the computed means are fairly evenly spread across all three types of organizational structures, indicating no perceptible trend for either type of organizational structure to produce greater dissatisfaction. Secondly, the means in the Large size classification subgroup, appear to be lower across all categories which would indicate a lesser degree of need dissatisfaction when "0" is equated as being satisfied. This finding could indicate that there may be a relationship between size of an organization and the perceived degree of need fulfillment which should be explored further.

Table 4. Mean Need Fulfillment Deficiencies for Each Category and Item: Three Types of Structures by Three Size Classifications.\*

Need Category	Item	Organization Structure	Size Classification		
			Small	Medium	Large
Security	I-1	A	.83	1.00	.22
		B	1.50	.00	.95
		C	1.02	.64	.40
Social	II-1	A	1.00	.92	.33
		B	.00	.75	.80
		C	1.00	.95	.68
	II-2	A	1.16	.30	.22
		B	.00	.12	.50
		C	.31	.58	.32
Esteem	III-1	A	.83	1.53	.88
		B	.00	.62	1.13
		C	.80	1.00	.68
	III-2	A	.16	.38	.77
		B	.00	.00	.66
		C	.65	.95	.48
	III-3	A	1.33	.69	.77
		B	.00	.87	1.08
		C	1.00	.93	.48
	III-4	A	.50	.69	.55
		B	1.00	.00	.70
		C	.51	.68	.52
Autonomy	IV-1	A	.33	1.30	.66
		B	.00	.62	.91
		C	.71	.89	.56
	IV-2	A	1.00	1.53	1.00
		B	.00	1.75	1.58
		C	1.14	1.18	.88

Table 4. Continued.

Need Category	Item	Organization Structure	Size Classification		
			Small	Medium	Large
Autonomy	IV-3	A	1.00	1.76	.44
		B	.00	.87	1.15
		C	1.05	1.12	.96
	IV-4	A	.66	1.23	.88
		B	.00	1.37	1.53
		C	1.17	1.29	.76
Self-Actualization	V-1	A	1.16	2.07	.88
		B	2.00	1.50	1.36
		C	1.05	1.08	.68
	V-2	A	.66	1.92	.66
		B	1.00	1.00	1.10
		C	1.00	1.00	.68
	V-3	A	1.16	1.38	.66
		B	1.50	1.00	1.21
		C	.80	1.29	.88
Non-Specific Items	VI-1	A	1.00	.92	.88
		B	.50	.75	1.18
		C	1.14	1.33	1.44
	VI-2	A	2.16	1.92	1.11
		B	1.50	1.12	1.14
		C	1.31	1.75	.96

\* No inferences about the effects of college size on administrative need satisfaction should be made from this table or table 6 since administrative level has not been held constant for the various size-of-college groups. Average administrative level is, however, spread across the three shapes within a given size category.

Table 5 presents the results of an F-test performed on the data to determine if there was, in fact, a structure effect on the perceived need fulfillments of vocational administrators. The results of the multi-analysis of variance analysis shows that there is no significant structure effect, size effect, or interaction effect at the .01 level of significance. In all categories the computed F-value is less than the tabular value. This finding supports the null hypothesis, that the type of structure has no significant effect on the perceived need fulfillments of vocational administrators.

#### Relationship of Structure to Need Importance

Table 6, presents data concerned with the degree of importance attached to each category by the respondents. In this table, the mean response to Part c (How important is this to me?) of each item is presented for each subgroup of respondents, classified by organizational structure and by size of college. Since the scale for Part c of each item runs from 1 for minimum importance to 7 for maximum importance, the larger an entry in a given cell of table 6, the greater the importance attached to that item by the subgroup of respondents.

The means in this table are generally evenly spread across all categorical areas showing no significant visual structure effect on the perceived degree of importance. The means in the social, autonomy, and self-actualization categories are of a slightly higher value

Table 5. Summary of Analysis of Variance Test: Mean Need Deficiencies for Each Category and Item.

Need Category	Computed F for		Null Hypothesis*	Computed F for Interaction Effect	Null Hypothesis**
	Structure Effect	Size Effect			
I. Security Need					
1. (security in job).	.5982	1.1575	retain	1.6225	retain
II. Social Needs					
1. (opportunity to help people).	.5839	.5789	retain	.5826	retain
2. (opportunity for friendship).	.7994	.1742	retain	2.345	retain
III. Esteem Needs					
1. (feeling of self-esteem).	.8552	.8966	retain	1.253	retain
2. (prestige outside college).	1.402	.6938	retain	1.605	retain
3. (prestige inside college).	.2778	.0286	retain	1.605	retain
4. (prestige from other professionals).	.0012	.3039	retain	1.103	retain
IV. Autonomy Needs					
1. (opportunity for independent thought and action).	.2778	1.572	retain	1.284	retain



Table 5. Continued.

Need Category	Computed F for		Null Hypothesis*	Computed F	
	Structure Effect	Size Effect		for Interaction Effect	Null Hypothesis**
2. (opportunity to participate in setting goals).	.5770	1.523	retain	.7734	retain
3. (opportunity to participate in determining methods).	.4574	1.288	retain	1.396	retain
4. (authority in position).	.1354	1.284	retain	1.124	retain
V. Self-Actualization Needs					
1. (opportunity for growth and development).	2.053	1.970	retain	.6273	
2. (feeling of self-fulfillment).	.2534	1.674	retain	1.287	retain
3. (feeling of accomplishment).	.2899	.8031	retain	.7072	retain
VI. Items specific to two or more need categories					
1. the pay for my position.	1.963	.2171	retain	.1908	retain
2. the feeling of being in the know.	.5915	.9327	retain	.8556	retain

\*The significance level for testing the null hypothesis was set at .01% with the F-tabular value equal to 4.61.

\*\*The significance level for testing the null hypothesis was set at .01% with the F-tabular value equal to 3.32.

Table 6. Mean Need Importance for Each Need Category and Item:  
Three Types of Structures by Three Size Classifications.

Need Category	Item	Organization Structure	Size Classification		
			Small	Medium	Large
Security	I-1	A	5.50	5.38	5.33
		B	6.00	5.00	5.35
		C	5.48	5.43	5.32
Social	II-1	A	6.66	6.61	6.00
		B	7.00	6.50	6.48
		C	6.25	6.50	6.64
	II-2	A	4.16	5.38	5.22
		B	5.50	5.00	5.35
		C	5.37	5.35	5.84
Esteem	III-1	A	4.50	5.61	5.66
		B	4.00	5.62	5.31
		C	5.05	5.04	5.36
	III-2	A	4.16	5.92	5.00
		B	4.00	4.75	5.13
		C	5.37	5.47	4.92
	III-3	A	4.50	5.46	5.33
		B	4.50	5.62	5.13
		C	5.25	4.93	5.48
	III-4	A	5.33	5.15	5.33
		B	5.00	4.62	4.95
		C	5.31	5.14	5.44
Autonomy	IV-1	A	6.50	6.07	5.44
		B	6.50	6.50	5.96
		C	6.17	6.12	6.28
	IV-2	A	5.50	6.07	5.88
		B	5.50	6.25	5.85
		C	5.97	6.18	6.40
	IV-3	A	6.33	6.23	5.77
		B	6.50	6.12	5.91
		C	5.82	6.14	6.12
	IV-4	A	4.00	5.30	5.55
		B	5.00	5.12	5.23
		C	5.00	5.31	5.12

Table 6. Continued.

Need Category	Item	Organization Structure	Size Classification		
			Small	Medium	Large
Self-Actualization	V-1	A	5.50	6.38	6.11
		B	6.00	5.75	5.78
		C	5.94	6.10	6.24
	V-2	A	6.16	6.30	6.66
		B	6.00	6.37	6.08
		C	6.25	6.04	6.40
	V-3	A	6.33	6.69	5.88
		B	6.50	6.75	6.26
		C	6.42	6.35	6.52
Non-Specific Items	VI-1	A	5.33	5.76	6.00
		B	5.00	5.50	5.60
		C	5.11	5.56	5.40
	VI-2	A	6.16	6.30	6.00
		B	5.50	6.62	6.36
		C	6.45	6.52	6.56

indicating that these psychological needs are considered by these respondents to be the most important.

An F-test performed on the data and presented in Table 7 shows that there is no significant structure effect, size effect, or interaction effect at the .01 level of significance. In all categories the computed F value is less than the tabular value. This finding supports the null hypothesis, that the type of structure has no significant effect on the degree of importance attached to the various needs of vocational administrators.

#### Summary of Structure Hypotheses Testing

The data obtained from the testing of the two structure hypotheses indicates that for community college organizations the structure variable appears not to have a significant effect on the perceived need fulfillments or degree of importance of the six categories of psychological needs. The organization in which these administrators live during working hours appears to be satisfying the basic psychological needs. This finding is not in agreement with the results of empirical research findings as reported in the review of literature. This disagreement could have been caused by one of the other organizational variables, age, size of institutions, or in the difference of educational level between the two samples.

Table 7. Summary of Analysis of Variance Test for the Degree of Need Importance for Each Category and Item.

Need Category	Computed F for		Null Hypothesis*	Computed F for Interaction	Null Hypothesis**
	Structure Effect	Size Effect			
I. Security Need					
1. (security in job).	.0039	.3126	retain	.1822	retain
II. Social Needs					
1. (opportunity to help people).	.3571	.6867	retain	1.461	retain
2. (opportunity for friendship).	1.9297	.6900	retain	.8219	
III. Esteem Needs					
1. (feeling of self-esteem).	.1545	2.096	retain	.8735	retain
2. (prestige outside college).	1.320	2.000	retain	2.127	retain
3. (prestige inside college).	.1262	.9772	retain	1.372	retain
4. (prestige from other professionals).	.4987	.3556	retain	.0135	retain
IV. Autonomy Needs					
1. (opportunity for independent thought and action).	.5974	1.947	retain	1.397	retain
2. (opportunity to participate in setting goals).	1.498	1.124	retain	.4861	retain

Table 7. Continued.

Need Category	Computed F for		Null Hypothesis*	Computed F for Interaction	Null Hypothesis**
	Structure Effect	Size Effect			
IV. Autonomy Needs (cont.)					
3. (opportunity to participate in determining methods).	.1781	.7903	retain	.7330	retain
4. (authority in position).	.1804	1.070	retain	.7870	retain
V. Self-Actualization Needs					
1. (opportunity for growth and development).	.3215	.2641	retain	.4524	retain
2. (feeling of accomplishment).	.2852	.4028	retain	.6704	retain
3. (feeling of accomplishment).	.2816	1.982	retain	1.443	retain
VI. Items specific to two or more categories					
1. the pay for my position	.7139	.8397	retain	.1339	retain
2. the feeling of being in the informed.	2.692	1.568	retain	.8139	retain

\* The significance level for testing the null hypothesis was set at .01% with the F-tabular value freedom equal to 4.61.

\*\* The significance level for testing the null hypothesis was set at .01% with the F-tabular value freedom equal to 3.32.

Satisfying psychological needs through the organizational structure is only one approach available to administration. There are many other variables, size of organization, leadership style and informal structure which can also contribute to, or detract from, the fulfillment of needs.

Relationship of the Administrative Level  
to Need Deficiencies

Table 8 presents the mean need deficiencies for the four levels of administration by category and subgroup. Data for this table were obtained by subtracting Part a from Part b of each question similar to the procedure used in Table 5. Examination of the table shows that in the medium size classification category, there appears to be a greater degree of need deficiency as indicated by larger means. The means appear to be smaller for the level I administrators all across the table in comparison with the level IV administrators. This finding would indicate a difference in need fulfillment as one goes up the organizational hierarchy from a level I to a level IV administrator. The areas showing the greatest over-all mean deficiency are in the categories of esteem, autonomy and self-actualization. The interaction effect is more clearly shown in the next table.

Table 8. Mean Need Deficiencies for Each Category and Item: Four Administrative Levels and Three Size Classification.

Need Category	Item	Administrative Level	Size Classification		
			Small	Medium	Large
Security	I-1	1	.00	1.50	.50
		2	1.12	.59	.73
		3	1.40	.62	.75
		4	.55	.66	.72
Social	II-1	1	.33	.00	.00
		2	.93	1.00	.78
		3	.53	.96	.65
		4	1.88	.66	1.00
	II-2	1	.00	.50	.00
		2	.25	.43	.36
		3	.26	.58	.43
		4	1.11	.16	.72
Esteem	III-1	1	.00	.50	.75
		2	1.06	1.00	.89
		3	.66	1.10	.97
		4	.66	1.33	1.45
	III-2	1	.00	.00	.00
		2	1.40	1.06	.89
		3	.59	1.23	1.47
		4	1.32	1.22	.68
	III-3	1	.00	3.00	.50
		2	1.06	1.09	.68
		3	.73	.48	1.02
		4	1.66	1.00	1.27
	III-4	1	.00	.50	.00
		2	.31	.40	.39
		3	.80	.79	.75
		4	.66	.83	1.27
Autonomy	IV-1	1	.00	2.00	.75
		2	.65	.78	.65
		3	.66	.93	.82
		4	.86	1.37	1.32



Table 8. Continued.

Need Category	Item	Administrative Level	Size Classification			
			Small	Medium	Large	
Autonomy (cont.)	IV-2	1	.00	2.00	.25	
		2	1.25	1.25	1.21	
		3	1.26	1.17	1.56	
		4	.77	2.16	1.36	
	IV-3	1	.00	.50	.00	
		2	1.06	1.00	1.05	
		3	1.13	1.31	1.07	
		4	1.00	2.16	1.18	
	IV-4	1	.00	2.00	.50	
		2	1.06	1.37	1.18	
		3	1.06	1.06	1.34	
		4	1.33	1.66	1.54	
	Self-Actuali- zation	V-1	1	.00	1.00	.75
			2	1.25	1.09	1.05
			3	.86	1.48	1.09
			4	1.66	1.83	1.72
V-2		1	.00	2.00	.25	
		2	1.06	.87	.89	
		3	1.00	1.24	.92	
		4	1.00	2.16	1.45	
V-3		1	.66	3.00	.50	
		2	1.12	1.03	1.13	
		3	.86	1.41	1.00	
		4	.55	1.33	1.36	
Non-Specific Items	VI-1	1	.66	.50	.25	
		2	1.50	1.06	.94	
		3	1.60	1.44	1.51	
		4	.77	.83	1.45	
	VI-2	1	.66	2.00	.25	
		2	1.25	1.31	1.18	
		3	1.60	1.96	1.41	
		4	1.77	2.50	1.72	

Table 9 summarizes the results of the multi-analysis of variance using the F-statistic to test the null hypothesis for each categorical sub-item. The null hypothesis was retained in all categories except for one of the interaction hypothesis in the esteem category. The computed F-value, in this case, exceeded the tabular value, thus rejecting the interaction null hypothesis. Caution must be exercised in rejecting the null hypothesis, that the scalar level has no significant effect on the perceived needs of vocational administrators, because at the .01 level of significance the one rejection could have occurred by chance. There is evidence, however, to permit us to conclude that there is something about the combination of levels and sizes that accounts for the variance in the data.

A Least Significant Difference (LSD) test was used to analyze the various means of the rejected hypothesis. The test indicated the following:

1. There was an interaction effect between the Level I administrators in Structure A and Structure B.
2. There was an interaction effect between the Level I administrators in Structure B and Level III administrators in Structure B.
3. There was an interaction effect between the Level I administrators in Structure B and Level II administrators in Structure C.

Table 9. F-Test of Need Fulfillment Deficiencies for Each Category and Item: Four Administrative Levels and Three Size Classifications.

Need Category	Item	Source	F-Test	Null Hypothesis*
Security	I-1	Level	.3211	retain
		Size	.1173	retain
		Interaction	.7182	retain
Social	II-1	Level	1.9849	retain
		Size	.5848	retain
		Interaction	.8750	retain
	II-2	Level	.5059	retain
		Size	1.9692	retain
		Interaction	1.0222	retain
Esteem	III-1	Level	.8240	retain
		Size	1.0980	retain
		Interaction	.4701	retain
	III-2	Level	1.1020	retain
		Size	.2743	retain
		Interaction	.5948	retain
	III-3	Level	1.714	retain
		Size	1.820	retain
		Interaction	2.901	<u>reject</u>
	III-4	Level	1.827	retain
		Size	.7718	retain
		Interaction	.4295	retain
Autonomy	IV-1	Level	.8989	retain
		Size	3.3420	retain
		Interaction	.7253	retain
	IV-2	Level	.5059	retain
		Size	1.9692	retain
		Interaction	1.0222	retain
	IV-3	Level	1.8276	retain
		Size	.7718	retain
		Interaction	.4295	retain

Table 9. Continued.

Need Category	Item	Source	F - Test	Null Hypothesis*
Autonomy (cont.)	IV-4	Level	.6370	retain
		Size	1.4110	retain
		Interaction	.5401	retain
Self-Actuali- zation	V-1	Level	1.7400	retain
		Size	.4920	retain
		Interaction	.5401	retain
	V-2	Level	1.4301	retain
		Size	2.6553	retain
		Interaction	.9268	retain
	V-3	Level	.1667	retain
		Size	3.8105	retain
		Interaction	1.557	retain
Non-Specific Items	VI-1	Level	1.8867	retain
		Size	1.7546	retain
		Interaction	.3112	retain
	VI-2	Level	1.9849	retain
		Size	.5848	retain
		Interaction	.8750	retain

\* The significance level for testing the null hypothesis was set at .01%. The F-tabular value for level equal to 3.78, size equal to 4.61, and interaction equal to 2.80.

4. There was an interaction effect between the Level III administrators in structure B and Level IV administrators in Structure A.

The results of the L. S. D. test are summarized in Appendix J. These findings suggest the results, for this item, might reflect only a sampling error, or the influence of some uncontrolled aspect of the study. In summary there is insufficient evidence to permit the rejection of the null hypothesis.

#### Relationship of the Administrative Level to Need Importance

The relationship between the degree of need importance and administrative level is summarized and presented in Table 10, and Table 11. Table 10, summarizes and presents the mean data obtained from Part c of each question. On a 1 to 7 scale, with 7 representing maximum importance and 1 representing minimum importance, the means are evenly spread across all subgroups making it hard to visually determine the level effect.

One implication which can be safely drawn from this table is that all four levels of vocational administrators ranked the degree of importance of the six need categories fairly evenly. Over-all this would indicate that the position level has no relationship to the degree of importance of the psychological needs. Further evaluation of

Table 10. Mean Need Importance for Each Category and Item: Four Administrative levels and Three Size Classifications.

Need Category	Item	Administrative Level	Size Classification		
			Small	Medium	Large
Security	I-1	1	6.00	7.00	5.50
		2	5.43	5.31	5.28
		3	5.33	5.41	5.26
		4	5.77	5.00	5.72
Social	II-1	1	7.00	7.00	6.50
		2	6.31	6.78	6.44
		3	6.27	6.41	6.41
		4	6.33	5.50	6.81
	II-2	1	6.00	6.00	5.25
		2	5.25	5.62	5.63
		3	4.93	5.13	5.26
		4	5.33	4.33	5.72
Esteem	III-1	1	5.00	7.00	5.75
		2	4.81	5.21	5.50
		3	4.80	5.06	5.04
		4	5.33	5.33	5.90
	III-2	1	6.00	7.00	4.75
		2	5.06	5.59	5.02
		3	4.60	5.27	4.97
		4	5.88	5.33	5.63
	III-3	1	4.66	6.50	5.25
		2	5.31	5.40	5.31
		3	4.86	4.75	5.09
		4	5.33	4.83	5.54
	III-4	1	4.66	6.00	5.25
		2	5.37	5.25	5.07
		3	5.25	4.86	5.02
		4	5.44	5.00	5.54
Autonomy	IV-1	1	6.00	6.50	5.75
		2	6.18	6.37	5.97
		3	6.13	6.13	6.07
		4	6.55	5.00	5.90

Table 10. Continued.

Need Category	Item	Administrative Level	Size Classification		
			Small	Medium	Large
Autonomy (cont.)	IV-2	1	6.67	7.00	6.25
		2	6.18	6.46	6.07
		3	5.33	6.00	5.97
		4	6.00	5.16	5.72
	IV-3	1	6.33	6.50	6.25
		2	5.87	6.43	6.13
		3	5.80	6.06	5.82
		4	6.11	5.00	5.72
	IV-4	1	5.00	6.00	5.75
		2	5.18	5.62	5.44
		3	4.40	4.93	5.00
		4	5.00	5.00	5.18
Self-Actuali- zation	V-1	1	6.33	6.50	6.25
		2	5.93	6.37	5.97
		3	5.53	5.89	5.85
		4	6.22	5.66	6.00
	V-2	1	6.67	7.00	6.50
		2	6.12	6.25	6.34
		3	6.00	5.96	6.14
		4	6.66	6.00	6.00
	V-3	1	6.33	7.00	6.25
		2	6.43	6.56	6.42
		3	6.20	6.44	6.12
		4	6.77	5.83	6.54
Non-Specific Items	VI-1	1	5.33	7.00	6.25
		2	5.25	5.62	5.81
		3	5.26	5.65	5.31
		4	4.66	4.66	5.54
	VI-2	1	6.33	7.00	6.00
		2	6.50	6.71	6.47
		3	6.20	6.41	6.36
		4	6.44	5.50	6.27

Table 11. F-test of Need Importance for Each Category and Item:  
Four Administrative Levels and Size Classifications.

Need Category	Item	Source	F-test	Null Hypothesis*
Security	I-1	Level	.7803	retain
		Size	.2118	retain
		Interaction	.3965	retain
Social	II-1	Level	1.4714	retain
		Size	.1485	retain
		Interaction	2.1882	retain
	II-2	Level	1.3714	retain
		Size	.1431	retain
		Interaction	.8247	retain
Esteem	III-1	Level	1.5275	retain
		Size	1.5571	retain
		Interaction	.4190	retain
	III-2	Level	2.1498	retain
		Size	1.7472	retain
		Interaction	.8850	retain
	III-3	Level	1.3920	retain
		Size	.4175	retain
		Interaction	.6183	retain
	III-4	Level	.2844	retain
		Size	.0201	retain
		Interaction	.3495	retain
Autonomy	IV-1	Level	.7787	retain
		Size	.7122	retain
		Interaction	1.6747	retain
	IV-2	Level	4.5534	<u>reject</u>
		Size	.1486	retain
		Interaction	1.4032	retain
	IV-3	Level	2.4460	retain
		Size	.2213	retain
		Interaction	1.5896	retain



Table 11. Continued.

Need Category	Item	Source	F-test	Null Hypothesis*
Autonomy (cont.)	IV-4	Level	2.8472	retain
		Size	1.0452	retain
		Interaction	.1690	retain
Self-actuali- zation	V-1	Level	1.3587	retain
		Size	.0564	retain
		Interaction	.4991	retain
	V-2	Level	1.3464	retain
		Size	.1104	retain
		Interaction	.6011	retain
	V-3	Level	.7912	retain
		Size	.1806	retain
		Interaction	1.0873	retain
Non-specific items	VI-1	Level	2.3464	retain
		Size	2.1518	retain
		Interaction	.8396	retain
	VI-2	Level	2.6403	retain
		Size	.2213	retain
		Interaction	1.5896	retain

\*The significance level for testing the null hypothesis was set at .01%. The F-tabular value for level was equal to 3.78, size equal to 4.61, and interaction equal to 2.80.

Table 10 reveals that the means in the medium size classification categories are a little higher for Level I administrators than they are for Level II, Level III, or Level IV administrators. Again as in a previous table, this finding would indicate that the relationship of size of institution to the degree of perceived importance should be explored further.

Table 11, like Table 9 summarizes the results of the multi-analysis of variance analysis using the F-statistic to test the null hypothesis. The null hypothesis were retained in all need categories except for one in the autonomy category. The level hypothesis was rejected in item IV-2 because the computed value 4.5534 exceeded the tabular value 3.78.

The Least Significant Difference (LSD) test was used to analyze the mean values in an attempt to locate the cause of the rejection. Based on the results of the LSD test summarized in Appendix K, the decision was made to retain the null hypothesis, that the scalar level has no significant effect on the degree of importance attached to the various psychological needs of vocational administrators. The results of the present analysis show that for this population, the position or job level within the administrative structure has little relationship to the degree of perceived importance of needs.

Summary of the Administrative Level  
Hypotheses Testing

The results obtained from testing the effects of the administrative position level in relation to the perceived need fulfillments and importance indicates that the position level of a vocational administrator in a community college has little effect on the psychological need satisfactions. These results would indicate that in a community college environment there are other variables which apparently have a more direct effect on the need satisfactions of administrators. This finding could have important implications for top administration if one believes in the concept of motivation through psychological need satisfaction.

## SUMMARY, CONCLUSIONS AND IMPLICATIONS

### Summary of Findings

This study investigated the relationships of the community college instructional organizational structure to the perceived psychological need fulfillments of 206 vocational administrators working in 73 community colleges in four western states. The dependent variable consisted of answers to sixteen need satisfaction questions based upon a Maslow type classification of needs.

The empirical findings of the present study presented in the preceding chapter can be summarized in relation to several other recent and relevant studies. The results of the first null hypothesis, that the type of structure has no significant effect on the perceived psychological need fulfillments of vocational administrators, can be compared with those findings obtained by Porter and Lawler (65), Porter and Siegal (66) and ElSalmi and Cummings (23). These earlier investigations showed that in business and industrial organizations the type of organizational structure had an effect on the need fulfillments of managers. These studies indicated that a tall organizational structure had an effect on the security and social need satisfactions, whereas a flat organizational structure influenced the self-actualization satisfactions.

In contrast, in the present study there was no relationship established between the shape of instructional organizational structures and the psychological need fulfillments of vocational administrators. This finding agrees with the earlier findings of Meltzer and Salter (48) who studied 704 physiological scientists working in non-academic organizations.

The testing of the second null hypothesis, that the type of structure has no significant effect on the degree of importance attached to the various psychological needs of vocational administrators, also shows that the type of structure has no significant effect on the degree of importance attached to the six categories of psychological needs. Some evidence was found when testing this null hypothesis which indicates that the size of institution may have an effect on the psychological need fulfillment and importance. However, before any firm conclusions are formulated this variable should be subjected to empirical research.

The results of this study along with the writings of others such as Lawrence and Lorsch (41), would suggest that any argument for or against a particular type of organizational structure should take into account other organizational factors or variables. An example of other organizational variables would be: total organization size, leadership styles, the informal structure, and the nature of the technology.

The results of the analysis of variance test performed on the data for the third hypothesis, that the administrative level has no significant effect on the perceived need fulfillment of vocational administrators, indicated that for the sample of respondents studied there was no significant relationship between the administrative level and the lower-order or higher-order psychological need satisfactions. Porter's research findings, using the same basic questionnaire, found:

1. The scalar position to be an important variable in determining the extent to which psychological needs are fulfilled.
2. The psychological needs of esteem, security and autonomy are more often satisfied in middle than bottom management levels.
3. Higher-order psychological needs are relatively the least satisfied needs in both bottom and middle management levels.

The results of the testing of the fourth hypothesis, that the administrative level has no significant effect on the degree of importance attached to the various psychological needs of vocational administrators, show that the level of a position or job within the administrative hierarchy is not related to the degree of perceived need importance. The present results also indicate that all four levels of vocational administration tend to be similar in the relative ranks they assigned to the importance of the six different psychological need

categories. This finding is very similar to what Porter (61) found in his earlier study. However, Porter's (61) same study found a relationship between the level of management and the perceived importance of the psychological needs. Higher-level managers tended to regard certain types of needs, autonomy and self-actualization needs, more important to them than lower-level managers.

Based upon the findings of this study and of others cited in the review of literature, one could question whether the findings on need satisfactions in business and industry generalize across institutional boundaries. Further research will undoubtedly show that institutional size, leadership style, age and education are important variables in determining need satisfaction.

### Conclusions

From the results of this study of community college vocational administrators, the following conclusions are reported:

1. The type of community college instructional organizational structure does not appear to be an important organizational variable in determining the extent to which psychological needs are fulfilled.
2. The type of community college instructional organizational structure does not appear to be related to the degree of perceived importance assigned to the psychological needs.

3. The administrative position level does not appear to be an important variable in determining the extent to which psychological needs are fulfilled.
4. The administrative position level does not appear to be related to the degree of perceived importance assigned to the psychological needs.
5. There is some evidence that the size of the institution may be an important variable in determining the degree to which perceived needs are fulfilled and the amount of importance assigned to the psychological needs.
6. All four levels of administrators tended to be similar in the relative ranks they assigned to the importance of the six different need categories.
7. Caution should be executed in interpreting the results of this study with the results of Porter's studies because of the two distinctly different statistical designs used to analyze the data. The multi-analysis of variance analysis is a very precise analysis in contrast to the sign-rank analysis.

### Implications

Based upon the preceding review of the literature, the findings of this study and subsequent conclusions, the following implications are proposed.



1. Additional research is recommended to ascertain the relationships of institutional size, educational level and age on the perceived need fulfillments and the degree of importance of the six psychological need classifications.
2. A replication of the second part of this study, the effects of the administrative position or job level on the need fulfillments and importance, should be conducted using a total community college administrative spectrum.
3. Any future studies using a similar questionnaire should consider statistically treating the data on a thirteen point scale. This can be done by subtracting plus scores (a) from (b) and minus scores (b) from (a) for each item. The reason for following this strategy is that a plus 7 would indicate a high degree of dissatisfaction whereas a minus 7 would indicate a high degree of satisfaction. The scores can thus range from -6 to +6, which includes 0, and gives a 13 point scale rather than a 7 point scale.
4. Evidence from this study indicates that findings related to perceived psychological need satisfaction in business and industry do not appear to generalize across institutional boundaries.

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## APPENDICES

APPENDIX A

A STUDY OF  
THE EFFECTS OF THE COMMUNITY COLLEGE  
ORGANIZATIONAL STRUCTURE ON VOCATIONAL  
ADMINISTRATORS JOB SATISFACTIONS

A RESEARCH PROJECT

DIVISION OF VOCATIONAL, ADULT, and  
COMMUNITY COLLEGE EDUCATION  
OREGON STATE UNIVERSITY

Arnie H. Heuchert, Instructor  
Community College Education

## NEED SATISFACTION AND FULFILLMENT QUESTIONNAIRE

On the following pages are listed several characteristics or qualities connected with your own position. For each such characteristic, you will be asked to give three ratings:

- (a) How much of the characteristic is there now connected with your position?
- (b) How much of the characteristic do you think should be connected with your position?
- (c) How important is this position characteristic to you?

Each rating will be on a seven-point scale, which will look like this:

(Minimum) 1 2 3 4 5 6 7 (Maximum)

You are to circle the number on the scale that represents the amount of the characteristic being rated. Low numbers represent low or minimum amounts and high numbers represent high or maximum amounts. If you think there is "very little" or "none" of the characteristic presently associated with the position, you would circle numeral 1. If you think there is "just a little," you would circle numeral 2, and so on. If you think there is a "great deal but not a maximum amount," you would circle numeral 6. For each scale, circle only one number.

Please do not omit any scales.

1. The feeling of self-esteem a person gets from being in my position (that is, the perception of one's self in terms of strength, of achievement, of abilities, of confidence in relation to others):
  - (a) How much is there now? (Minimum) 1 2 3 4 5 6 7 (Maximum)
  - (b) How much should there be? 1 2 3 4 5 6 7
  - (c) How important is this to me? 1 2 3 4 5 6 7
  
2. The authority connected with my position:
  - (a) How much is there now? (Minimum) 1 2 3 4 5 6 7 (Maximum)
  - (b) How much should there be? 1 2 3 4 5 6 7
  - (c) How important is this to me? 1 2 3 4 5 6 7

3. The opportunity for personal growth and development in my position (that is, the extent to which members are able to fulfill their own potential, to achieve their personal goals and rewards important to them):
- (a) How much is there now? (Minimum) 1 2 3 4 5 6 7 (Maximum)
- (b) How much should there be? 1 2 3 4 5 6 7
- (c) How important is this to me? 1 2 3 4 5 6 7
4. The prestige of my position inside the college (that is, the regard received from others in the college such as students, associates, administrators, and instructors):
- (a) How much is there now? (Minimum) 1 2 3 4 5 6 7 (Maximum)
- (b) How much should there be? 1 2 3 4 5 6 7
- (c) How important is this to me? 1 2 3 4 5 6 7
5. The opportunity for independent thought and action in my position:
- (a) How much is there now? (Minimum) 1 2 3 4 5 6 7 (Maximum)
- (b) How much should there be? 1 2 3 4 5 6 7
- (c) How important is this to me? 1 2 3 4 5 6 7
6. The feeling of security in my position:
- (a) How much is there now? (Minimum) 1 2 3 4 5 6 7 (Maximum)
- (b) How much should there be? 1 2 3 4 5 6 7
- (c) How important is this to me? 1 2 3 4 5 6 7
7. The feeling of self-fulfillment a person gets from being in my position (that is, the feeling of being able to use one's own unique capabilities, realizing one's potentialities):
- (a) How much is there now? (Minimum) 1 2 3 4 5 6 7 (Maximum)
- (b) How much should there be? 1 2 3 4 5 6 7
- (c) How important is this to me? 1 2 3 4 5 6 7
8. The Prestige of my position outside the college (that is, the regard received from others not in the college such as community citizens, others in the profession):
- (a) How much is there now? (Minimum) 1 2 3 4 5 6 7 (Maximum)
- (b) How much should there be? 1 2 3 4 5 6 7
- (c) How important is this to me? 1 2 3 4 5 6 7

3

9. The feeling of worthwhile accomplishment in my position:
- (a) How much is there now? (Minimum) 1 2 3 4 5 6 7 (Maximum)
- (b) How much should there be? 1 2 3 4 5 6 7
- (c) How important is this to me? 1 2 3 4 5 6 7
10. The opportunity, in my position, to give help to other people (that is, students, associates, administrators and instructors):
- (a) How much is there now? (Minimum) 1 2 3 4 5 6 7 (Maximum)
- (b) How much should there be? 1 2 3 4 5 6 7
- (c) How important is this to me? 1 2 3 4 5 6 7
11. The opportunity, in my position, for participating in the setting of the institution's goals:
- (a) How much is there now? (Minimum) 1 2 3 4 5 6 7 (Maximum)
- (b) How much should there be? 1 2 3 4 5 6 7
- (c) How important is this to me? 1 2 3 4 5 6 7
12. The opportunity, in my position, for participating in the determination of methods and procedures (that is, policies and procedures necessary for your functioning effectively in the organization):
- (a) How much is there now? (Minimum) 1 2 3 4 5 6 7 (Maximum)
- (b) How much should there be? 1 2 3 4 5 6 7
- (c) How important is this to me? 1 2 3 4 5 6 7
13. The feeling of being informed in my position (that is, being informed of matters essential to be effective in your position):
- (a) How much is there now? (Minimum) 1 2 3 4 5 6 7 (Maximum)
- (b) How much should there be? 1 2 3 4 5 6 7
- (c) How important is this to me? 1 2 3 4 5 6 7
14. The opportunity to develop close friendships in my position (that is, with associates, administrators, students and instructors):
- (a) How much is there now? (Minimum) 1 2 3 4 5 6 7 (Maximum)
- (b) How much should there be? 1 2 3 4 5 6 7
- (c) How important is this to me? 1 2 3 4 5 6 7

15. The opportunity, in my position, to achieve professional status and recognition from professional peers outside of the organization:
- (a) How much is there now? (Minimum) 1 2 3 4 5 6 7 (Maximum)
- (b) How much should there be? 1 2 3 4 5 6 7
- (c) How important is this to me? 1 2 3 4 5 6 7
16. The feeling of pressure in my position:
- (a) How much is there now? (Minimum) 1 2 3 4 5 6 7 (Maximum)
- (b) How much should there be? 1 2 3 4 5 6 7
- (c) How important is this to me? 1 2 3 4 5 6 7
17. The pay for my position:
- (a) How much is there now? (Minimum) 1 2 3 4 5 6 7 (Maximum)
- (b) How much should there be? 1 2 3 4 5 6 7
- (c) How important is this to me? 1 2 3 4 5 6 7

Note: To help us in the statistical analysis of the data, we need the following information:

1. How many levels of supervision are there in your college (from first level department head or division chairman to the president but not including the president?) Give number \_\_\_\_\_
2. How many full-time employees (administrators, instructional and non-instructional or non-professional) are there in your college? \_\_\_\_\_
3. What is the institution's estimated yearly (1971-72) F. T. E. ? \_\_\_\_\_
4. How many administrators report directly to the president? \_\_\_\_\_
5. How would you classify your institution:
  - \_\_\_\_\_ Urban
  - \_\_\_\_\_ Suburban
  - \_\_\_\_\_ Rural
6. Please check your title or position:
  - \_\_\_\_\_ Dean
  - \_\_\_\_\_ Assistant or Associate Dean
  - \_\_\_\_\_ Director
  - \_\_\_\_\_ Department Chairman
  - \_\_\_\_\_ Division Chairman
  - \_\_\_\_\_ Instructor
  - \_\_\_\_\_ Other \_\_\_\_\_

7. If you have an instructional problem, who would you ask first for assistance (that is, a problem dealing with an area such as: curriculum, class room or an instructor):

President  
 Vice President  
 Dean  
 Associate or Assistant Dean  
 Director  
 Division Chairman  
 Department Chairman  
 Other \_\_\_\_\_

8. If you have a student problem, who would you ask first for assistance (such as, attendance or discipline):

President  
 Vice President  
 Dean  
 Associate or Assistant Dean  
 Director  
 Division Chairman  
 Department Chairman  
 Other \_\_\_\_\_

9. Time in present position:

<input type="checkbox"/> 0- $\frac{1}{2}$ year	<input type="checkbox"/> 4-5 years
<input type="checkbox"/> $\frac{1}{2}$ -1 year	<input type="checkbox"/> 5-10 years
<input type="checkbox"/> 1-2 years	<input type="checkbox"/> 10-15 years
<input type="checkbox"/> 2-3 years	<input type="checkbox"/> More than 15 years
<input type="checkbox"/> 3-4 years	

10. Total time with the college:

<input type="checkbox"/> 0-1 year	<input type="checkbox"/> 4-5 years
<input type="checkbox"/> 1-2 years	<input type="checkbox"/> 5-10 years
<input type="checkbox"/> 2-3 years	<input type="checkbox"/> 10-15 years
<input type="checkbox"/> 3-4 years	<input type="checkbox"/> More than 15 years

11. Age:

<input type="checkbox"/> 20-24	<input type="checkbox"/> 40-49
<input type="checkbox"/> 25-29	<input type="checkbox"/> 50-59
<input type="checkbox"/> 30-34	<input type="checkbox"/> 60 or over
<input type="checkbox"/> 35-39	

12. Highest degree of education attained:

High School Diploma  
 Associate of Arts Degree  
 Bachelor of Arts or Science Degree  
 Master's Degree  
 Doctor's Degree

APPENDIX B

Jury of Experts Revision Form

From: \_\_\_\_\_  
                        name                                position                                institution

Subject: Suggested Revisions to Need Satisfaction Instrument

Item No.  Suggested Revisions

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Suggested Additions  
(new items)

_____
_____
_____
_____
_____
_____



Additional Comments

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Note: If additional space is needed, please attach sheet to this memo.

## APPENDIX C

## Community Colleges Participating in the Study

California

1. Butte Junior College  
2239 Midway  
Durham, California  
95938
2. Cabrillo Junior College  
6500 Soquel Drive  
Aptos, California  
95003
3. Cerritos Junior College  
11110 East Alondra Boulevard  
Norwalk, California  
90605
4. Chabot Junior College  
25555 Hesperian Boulevard  
Hayward, California  
94545
5. Chaffy Junior College  
5885 Haven Avenue  
Alta Loma, California  
91701
6. City College of San Francisco  
50 Phelan Avenue  
San Francisco, California
7. College of the Canyons  
Valencia, California  
91321
8. College of the Desert  
43-500 Monterey Avenue  
Palm Desert, California  
92260
9. College of the Redwoods  
Eureka, California  
95501
10. College of the Siskiyous  
Route 1, Box 1025  
Weed, California  
94545
11. Compton Junior College  
1111 East Artesia Boulevard  
Compton, California  
90221
12. Cuesta Junior College  
Post Office Box J  
San Luis Obispo, California  
93401
13. El Camino Junior College  
16007 South Crenshaw Blvd.  
El Camino, California  
90506
14. Gavilan Junior College  
Post Office Box 16  
Gilroy, California  
95020
15. Glendale Junior College  
411 East Wilson Avenue  
Glendale, California  
91206
16. Grossmont College  
8800 Grossmount College Dr.  
El Cajon, California  
92020

17. Hartnell College  
156 Homestead Avenue  
Salinas, California  
93901
18. Lassen Junior College  
1324 Cornell Street  
Susanville, California  
96130
19. Long Beach City College  
4901 East Carson Street  
Long Beach, California  
90808
20. Merced Junior College  
3600 M Street  
Merced, California  
95340
21. Mira Costa Junior College  
Barnard Drive  
Oceanside, California  
92054
22. Mt. San Antonio College  
1100 North Grand Avenue  
Walnut, California  
91789
23. Monterey Peninsula College  
980 Fremont  
Monterey, California  
93940
24. Napa College  
2277 Napa-Vallejo Highway  
Napa, California  
94558
25. Palomar Junior College  
Highway 78  
San Marcos, California
26. Pasadena City College  
1570 East Colorado Boulevard  
Pasadena, California  
91106
27. Riverside City Junior College  
3650 Fairfax Avenue  
Riverside, California  
92506
28. San Bernardino Valley Junior  
College  
701 South Mt. Vernon Avenue  
San Bernardino, California  
92403
29. San Joaquin Delta Junior  
College  
3301 Kensington Way  
Stockton, California  
95204
30. San Jose City Junior College  
2100 Moorpark Avenue  
San Jose, California  
95114
31. Santa Ana Junior College  
1405 French Street  
Santa Ana, California  
92701
32. Santa Barbara City College  
721 Cliff Drive  
Santa Barbara, California
33. Santa Rosa Junior College  
1501 Mendocino Avenue  
Santa Rosa, California  
95401
34. Shasta Junior College  
Old Oregon Trail  
Redding, California  
96001

35. Sierra Junior College  
5000 Rocklin Road  
Rocklin, California  
95677
36. Taft Junior College  
Post Office Box zz  
Taft, California  
93268
37. Victor Valley Junior College  
Post Office Box 910  
Victorville, California  
92392
38. West Valley Junior College  
44 East Latimer Avenue  
Campbell, California  
95008
39. Yuba Junior College  
Beale Road at Linda Avenue  
Marysville, California  
95501
- Colorado
40. Aimes Junior College  
P. O. Box 69  
Greeley, Colorado  
80631
41. El Paso Community College  
Colorado Springs, Colorado  
80903
42. Lamar Community College  
Lamar, Colorado  
81025
43. Messa Community College  
Grand Junction, Colorado  
81648
44. Morgan County Community  
College  
Fort Morgan, Colorado  
80701
45. Northeastern Junior College  
Sterling, Colorado  
80751
46. Otero Junior College  
La Junta, Colorado  
81050
47. Trinidad State Junior College  
Trinidad, Colorado  
81082
- Oregon
48. Blue Mountain Community  
College  
2410 N. W. Carden Avenue  
Pendleton, Oregon  
97801
49. Central Oregon Community  
College  
College Way  
Bend, Oregon  
97701
50. Chemeketa Community College  
4389 Satter Drive N. E.  
Salem, Oregon  
97303
51. Clackamas Community College  
19600 S. Molalla Avenue  
Oregon City, Oregon  
97045
52. Clatsop Community College  
16th and Jerome  
Astoria, Oregon  
97103

53. Lane Community College  
4000 E. 30th Avenue  
Eugene, Oregon  
97405
54. Mt. Hood Community College  
26000 S. E. Stark  
Gresham, Oregon  
97030
55. Portland Community College  
12000 S. W. 49th Avenue  
Portland, Oregon  
97219
56. Southwestern Oregon Community College  
Coos Bay, Oregon  
97420
57. Treasure Valley Community College  
Ontario, Oregon  
97914
58. Umpqua Community College  
Roseburg, Oregon  
97470
- Washington
59. Big Bend Community College  
NUB 301  
Moses Lake, Washington  
98837
60. Clark College  
1800 East McLoughlin Blvd.  
Vancouver, Washington  
98663
61. Columbia Basin College  
2600 North Chase Avenue  
Pasco, Washington  
99301
62. Fort Steilacoom Community College  
6010 Mount Tacoma Drive  
Tacoma, Washington  
98499
63. Grays Harbor College  
College Heights  
Aberdeen, Washington  
98520
64. Green River Community College  
12401 Southeast 320th Street  
Auburn, Washington  
98002
65. Highline Community College  
South 240th at Pacific  
Highway South  
Midway, Washington  
98031
66. Lower Columbia College  
1600 Maple Street  
Longview, Washington  
98632
67. Olympic College  
1519 Chester Avenue  
Bremerton, Washington  
98310
68. Peninsula College  
Lauridsen and Ennis  
Port Angeles, Washington  
98362
69. Shoreline Community College  
16101 Greenwood Avenue No.  
Seattle, Washington  
98133

- |  |   |
|--|---|
| 70. Skagit Valley College<br>2405 College Way<br>Mount Vernon, Washington<br>98273         | 72. Wenatchee Valley College<br>1300 - 5th Street<br>Wenatchee, Washington<br>98801 |
| 71. Walla Walla Community<br>College<br>340 South Park<br>Walla Walla, Washington<br>99362 | 73. Yakima Valley College<br>Sixteen and Nob Hill<br>Yakima, Washington<br>98902    |



APPENDIX D

**OREGON STATE UNIVERSITY**  
SCHOOL OF EDUCATION

CORVALLIS, OREGON 97331

Research is currently underway at Oregon State University to investigate the relation of the administrative organizational structure to the job satisfactions of vocational administrators at the two-year college level. Vocational administrators from California, Colorado, Oregon, and Washington will be surveyed to determine if there is a relationship between the organizational structure of the college and the vocational administrator's perceived need satisfactions.

We would appreciate receiving permission to obtain data for this study by mailing a questionnaire to three of your vocational administrators: one to a dean or assistant dean, one to a director or supervisor, and one to a division chairman or department chairman. Neither respondents nor individual colleges will be identified in the final report, a copy of which will be mailed to you.

Dr. Baird, project consultant and former president of Clark College, and Dr. Klapstein, president of Mt. Hood Community College, both former board members of the American Association of Junior Colleges, are supportive of our efforts and have suggested that we contact you for the purpose of soliciting your cooperation. This project has the approval of the CJCA Committee for Research and Development.

Enclosed is a self-addressed response card to indicate your approval or disapproval for us to contact your staff during the month of January, along with a sample questionnaire.

Thank you for your consideration of this request.

Sincerely,

Henry Ten Pas, Director  
Division of Vocational, Adult, and  
Community College Education

cps

Enclosures 2

Arnie H. Heuchert, Instructor  
Community College Education



APPENDIX F

**OREGON STATE UNIVERSITY**

SCHOOL OF EDUCATION

CORVALLIS, OREGON 97331

December 15, 1971

Dr. Ramon LaGrandeur  
Lane Community College  
4000 East 30th Avenue  
Eugene, Oregon 97405

Dear Dr. LaGrandeur:

Research is currently underway at Oregon State University to investigate the relation of the administrative organizational structure to the job satisfactions of vocational administrators at the two-year college level. Vocational administrators (deans, assistant deans, directors, and department chairmen) from California, Colorado, Oregon, and Washington are being surveyed to determine if there is a relationship between the organizational structure of the college and the vocational administrator's perceived job satisfactions.

Your president has indicated his willingness to have you and your institution participate in this study and has suggested that we contact you for your assistance. We would like to ask you to complete the short questionnaire and return it to us. We are aware of the demands on your time and are very appreciative of your professional assistance.

This is not a study of individuals or of individual colleges. Neither the respondents nor individual colleges will be identified in the final report, a copy of which will be mailed to you. All respondents will be classified as working under either a tall or a flat administrative span of control.

Thank you for your consideration of this request. Your early response will be appreciated.

Sincerely,

Arnie H. Heuchert, Instructor  
Community College Education

jlh

Enclosure





CORVALLIS, OREGON 97331

APPENDIX F

OREGON STATE UNIVERSITY

SCHOOL OF EDUCATION

January 31, 1972

Mr. Wesley W. Steyer, Division Chairman  
San Joaquin Delta Junior College  
3301 Kensington Way  
San Bernardino, California 92403

Dear Mr. Steyer:

With the approval of your president, I recently mailed you a questionnaire requesting your help in obtaining data for a study of community college organizational structures and individual perceived need satisfactions. If you have already completed and returned the questionnaire, please consider this note as an expression of our appreciation.

If you have not responded, I would appreciate your response by February 10 in order to meet the time scheduled for the computer. For your convenience I have enclosed another questionnaire in the event that the first one was misplaced.

Thank you for your cooperation.

Sincerely,

Arnie H. Heuchert, Instructor  
Community College Education

cps  
Enclosure

## APPENDIX G

## Coding of Data Cards

Data for each of the 206 respondents was coded on the data card as follows:

<u>Column</u>	
1	1 to 3 represents the F. T. E. size of the institution.
3	1 to 3 represents the type of administrative structure.
5	1 to 4 represents the administrative level.
7	1 to 9 represents the length of time in the administrative position.
9	1 to 8 represents the length of time with the college.
11	1 to 7 represents the age of the individual.
13	1 to 5 represents the educational degree achieved by the individual respondent.
15 - 75	Data. Response values assigned to each question by respondent.

## APPENDIX H

### General Linear Hypothesis Program, Structure Effect

PROBLEM NUMBER 32 -  
 NUMBER OF DESIGN CARD SETS 9  
 NUMBER OF VARIABLE FORMAT CARDS INCORRECTLY SPECIFIED.  
 ASSUMED TO BE 1.  
 NUMBER OF INDEPENDENT VARIABLES 9

FORMAT  
 (31X,F1.0)

DESIGN

1	1	1	0	1	0	1	0	0	0
2	1	1	0	0	1	0	1	0	0
3	1	1	0	-1	-1	-1	0	0	0
4	1	0	1	1	0	0	0	1	0
5	1	0	1	0	1	0	0	0	1
6	1	0	1	-1	-1	0	0	-1	-1
7	1	-1	-1	1	0	-1	0	-1	0
8	1	-1	-1	0	1	0	-1	0	-1
9	1	-1	-1	-1	-1	1	1	1	1

DESIGN	NO. OF REPS	MISSING REPS	MEAN Y	STD. DEV. Y
1	6	(0)	5.333333	1.03280
2	13	(0)	5.76923	1.36344
3	9	(0)	6.00000	1.70711
4	2	(0)	5.00000	1.41421
5	8	(0)	5.50000	1.92582
6	60	(0)	5.60000	1.23782
7	25	(0)	5.11429	1.40945
8	49	(0)	5.56250	1.38235
9	25	(0)	5.45000	1.38444

HYPOTHESES AND SUMS OF SQUARES EXPLAINED BY HYPOTHESES

1	00000000	0
2	11111111	6230.60362
3	10011111	6228.18720
4	11101111	6227.76140
5	11110000	6229.69666
6	10000000	6220.50485

ESTIMATES OF COEFFICIENTS

HYPOTHESES

VARIABLE	1	2	3	4	5	6
1	JE 00	5.4754833E 00	5.4216450E 00	5.5828759E 00	5.5069228E 00	5.4951456E 00
2	GE 00	2.2537139E-01	0E 00	1.5688428E-01	1.9124075E-01	0E 00
3	GE 00	-1.0991665E-01	0E 00	7.1808343E-02	-5.8072650E-02	0E 00
4	GE 00	-3.2627696E-01	-3.4075077E-01	0E 00	-2.8297898E-01	0E 00
5	GE 00	1.3509361E-01	1.5370483E-01	0E 00	1.5062098E-01	0E 00
6	GE 00	-4.1244403E-02	-1.4114565E-01	-9.4541196E-02	0E 00	0E 00
7	GE 00	-6.6717542E-02	1.2226431E-02	7.7312950E-04	0E 00	0E 00
8	GE 00	-4.1389703E-02	4.7626572E-02	2.8097262E-01	0E 00	0E 00
9	GE 00	-1.7502765E-03	-4.3219640E-02	-2.0131765E-01	0E 00	0E 00

RESIDUAL SUM SOS. 6.6540000E 03 3.3339638E 02 3.3581280E 02 3.3623860E 02 3.3430334E 02 3.4349515E 02

DEGREES OF FREEDOM OF RESIDUALS 206 197 199 199 201 205

F TESTS 7.1391633E-01 8.3971593E-01 1.3397779E-01 7.4590503E-01

DEGREES OF FREEDOM OF F TESTS 2 197 2 197 4 197 8 197

APPENDIX I

General Linear Hypothesis Program, Level Effect

PROBLEM NUMBER 32  
 NUMBER OF DESIGN CARD SETS 12  
 NUMBER OF VARIABLE FORMAT CARDS INCORRECTLY SPECIFIED, ASSUMED TO BE 1.  
 NUMBER OF INDEPENDENT VARIABLES 12  
 FORMAT (31X,F1.0)

DESIGN

1	1	1	0	0	1	0	1	0	0	0	0	0	0
2	1	1	0	0	0	1	0	1	0	0	0	0	0
3	1	1	0	0	-1	-1	-1	-1	0	0	0	0	0
4	1	0	1	0	1	0	0	0	1	0	0	0	0
5	1	0	1	0	0	1	0	0	0	1	0	0	0
6	1	0	1	0	-1	-1	0	0	-1	-1	0	0	0
7	1	0	0	1	1	0	0	0	0	0	1	0	0
8	1	0	0	1	0	1	0	0	0	0	0	1	0
9	1	0	0	1	-1	-1	0	0	0	0	-1	-1	0
10	1	-1	-1	-1	1	0	-1	0	-1	0	-1	0	0
11	1	-1	-1	-1	0	1	0	-1	0	-1	0	-1	0
12	1	-1	-1	-1	-1	-1	1	1	1	1	1	1	1

DESIGN	NO. OF REPS	MISSING REPS	MEAN Y	STD. DEV. Y
1	3	( 0)	5.33333	.57735
2	2	( 0)	7.00000	0
3	4	( 0)	6.25000	.50000
4	16	( 0)	5.25000	1.48324
5	32	( 0)	5.62500	1.26364
6	38	( 0)	5.81579	1.11149
7	15	( 0)	5.26667	1.09978
8	29	( 0)	5.65517	1.17339
9	41	( 0)	5.31707	1.33115
10	9	( 0)	4.66667	1.65831
11	6	( 0)	4.66667	2.06559
12	11	( 0)	5.54545	1.36848

HYPOTHESES AND SUMS OF SQUARES EXPLAINED BY HYPOTHESES

1	000000000000	0
2	111111111111	6245.94909
3	100111111111	6234.40870
4	111100111111	6238.89361
5	111111000000	6237.68945
6	100000000000	6220.50485

ESTIMATES OF COEFFICIENTS  
 HYPOTHESES

VARIABLE	1	2	3	4	5	6
1	0E 00	5.5326519E 00	5.4504115E 00	5.5475658E 00	5.5216949E 00	5.4951456E 00
2	0E 00	6.6179253E-01	0E 00	6.4184031E-01	5.8906472E-01	0E 00
3	0E 00	7.0944580E-02	0E 00	4.9522578E-02	5.4600274E-02	0E 00
4	0E 00	-1.1968116E-01	0E 00	-9.6954374E-02	-1.6562252E-01	0E 00
5	0E 00	-4.0348524E-01	-6.1128373E-01	0E 00	-2.8574328E-01	0E 00
6	0E 00	2.0405786E-01	1.8077377E-01	0E 00	1.4129012E-01	0E 00
7	0E 00	-4.5762587E-01	-3.9259408E-01	1.1647733E-01	0E 00	0E 00
8	0E 00	6.6149770E-01	3.3861526E-01	2.9408900E-01	0E 00	0E 00
9	0E 00	8.9888753E-02	3.4117575E-02	-1.6473527E-01	0E 00	0E 00
10	0E 00	-1.4265435E-01	-9.4562500E-02	-4.3699743E-03	0E 00	0E 00
11	0E 00	2.5718116E-01	2.8718656E-01	1.0565226E-02	0E 00	0E 00
12	0E 00	3.8143805E-02	5.4839392E-02	1.6893992E-01	0E 00	0E 00

RESIDUAL SUM SQS. 6.564000E 03 3.1305091E 02 3.2959170E 02 3.2510639E 02 3.2631055E 02 3.4349515E 02

DEGREES OF FREEDOM OF RESIDUALS 206 194 197 196 200 205

F TESTS 2.3464132E 03 2.1518008E 00 8.3968246E-01 1.4109184E 00

DEGREES OF FREEDOM OF F TESTS 3 194 2 194 6 194 11 194

## APPENDIX J

Distribution of L. S. D. values for rejected hypothesis III-c

Variable	$\bar{X} - \bar{X}$ Mean	L. S. D. Mean	Variable	$\bar{X} - \bar{X}$ Mean	L. S. D. Mean
1-2	3.00	2.72*	5-6	.41	.71
1-3	.50	2.27	5-7	.36	.93
1-4	1.06	1.11	5-8	.61	.71
1-5	1.09	1.80	5-9	.07	.70
1-6	.68	1.78	5-10	.57	1.12
1-7	.73	1.88	5-11	.09	1.32
1-8	.48	1.80	5-12	.18	1.04
1-9	1.02	1.78			
1-10	1.66	1.99	6-7	.05	.91
1-11	1.00	2.91	6-8	.20	.73
1-12	1.27	1.94	6-9	.34	.71
			6-10	.98	1.10
2-3	2.50	2.58	6-11	.32	1.31
2-4	1.94	2.23	6-12	.59	1.01
2-5	1.91	2.17			
2-6	2.32	2.16*	7-8	.25	.94
2-7	2.27	2.31	7-9	.29	.90
2-8	2.52	2.18*	7-10	.93	1.25
2-9	1.98	2.16	7-11	.28	1.44
2-10	1.34	2.33	7-12	.36	.93
2-11	2.00	2.43			
2-12	1.73	2.29	8-9	.46	.72
			8-10	1.18	1.13*
3-4	.56	1.66	8-11	.52	1.33
3-5	.59	1.58	8-12	.61	.76
3-6	.18	1.56			
3-7	.23	1.67	9-10	.64	1.09
3-8	.02	1.59	9-11	.02	1.30
3-9	.52	2.16	9-12	.25	1.01
3-10	1.16	1.79			
3-11	.50	1.92	10-11	.66	1.57
3-12	.77	1.72	10-12	.39	.95

## Appendix J. Continued.

Variable	$\bar{X} - \bar{X}$ Mean	L. S. D. Mean	Variable	$\bar{X} - \bar{X}$ Mean	L. S. D. Mean
4-5	.03	.91	11-12	.73	1.51
4-6	.38	.88			
4-7	.33	1.07			
4-8	.58	.92			
4-9	.04	.87			
4-10	1.24	1.60			
4-11	.06	1.42			
4-12	1.16	1.21			

\* Means are different if L. S. D. value is less than  $\bar{X} - \bar{X}$  mean.

## APPENDIX K

Distribution of L. S. D. values rejected  
for hypothesis IV-b

Variable	$\bar{X} - \bar{X}$ Mean	L. S. D. value
1-1	.00	.00
1-2	.32	1.03
1-3	.69	1.03
1-4	.87	1.13
2-3	.37	.45
2-4	.55	.65
3-4	.18	.66

Means are different if L. S. D. value is less than  $\bar{X} - \bar{X}$  mean.