ABSTRACT
        In this study the control structures of 37 academic
departments at the University of Illinois were characterized in terms
of (a) the total amount of control in the department, and (b) the
distribution of control among tenured and nontenured faculty members.
A consistent pattern of interaction effects of total control and
distribution of control on departmental and individual outputs was
found. In departments in which control was distributed in an
hierarchical fashion, a negative relationship occurred between total
control in the department and output. This negative relationship is
contrary to the positive relationship typically found in other
organizations. There was no significant relationship found between
total control and output in departments in which the distribution of
control was egalitarian. (Author/HS)

ORGANIZATIONAL CONTROL

IN UNIVERSITY DEPARTMENTS

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University of Washington

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Abstract

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ORGANIZATIONAL CONTROL IN UNIVERSITY DEPARTMENTS[1]

Gerald R. Oncken

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The study of organizations had led social scientists to a variety of settings, ranging from leagues of women voters to pajama factories, from hospitals to military organizations. One organization which has been left largely untouched by the systematic observational techniques of social scientists is the university. What Caplow and McGee (1958) stated twelve years ago is still quite true today: "The methods of social research have been applied by university professors to every important American institution except their own."

This observation was reinforced in a recent bibliographical survey of the literature on the administration of higher education by Betsy Ann Olive (1967). Her conclusion was that although there was a large literature on the administration of higher education, very little of it was based on empirical research.

There are two major reasons that research on universities is important. The first reason is the theoretical interest of universities as organizations. Universities are provocative specimens of social organizations, very much unlike other types of organizations. One important question, therefore, is whether other organizational theories are applicable to the university. There are at least three arguments which cast doubt on this possibility: 1) the goals of universities are not

specific or clearly defined; 2) the products and services of universities are not tangible; 3) the consumer (student) exerts little influence on the organization; and 4) the decision making process in universities is diffused, as opposed to the formal authority hierarchies which typically characterize manufacturing organizations.

The second reason that research in universities is important is the practical one. With increased emphasis on higher education in our society, coupled with a rapid population growth, university enrollments have risen sharply, and increasing numbers of people are pursuing their education beyond the baccalaureate to the masters and doctoral level. This places a heavy burden on university academic departments to provide high quality education at high levels, while maintaining a suitable atmosphere for high quality research and scholarly work by the faculty.

The present study focused on university academic departments as organizations. In particular, the study was designed to investigate one important aspect of the organization of university departments, namely the process of control.   By definition, an organization limits and constrains the behavior of its individual members. This process of control is necessary for orderly functioning and goal achievement within the organization.

Recent theoretical and empirical analysis of the control structure of organizations has been conducted by Tannenbaum and his associates (c.f., Tannenbaum, 1968). Among the innovations of the work of Tannenbaum was the idea that the amount of control in an organization is a variable quantity, which was contrary to the traditional assumption that power in a social system is a fixed quantity. Under the fixed quantity assumption, leaders and followers in the organization engage in a "zero sum game" competing for the

available control. An implication of the fixed quantity assumption is

that in order to involve the rank-and-file members of an organization in

the decision making process, managers must necessarily relinquish some

of their control. Among the first to question the fixed quantity

assumption were Tannenbaum and Kahn (1958). They argued that there is

a variable amount of control in organizations, and that the total amount

of control can vary both across different organizations and within the

same organization at different periods of time.

Tannenbaum (1968) has argued that control within an organization can

be increased internally by changing structural conditions so that

interaction and influence among members are expedited and by increasing

the motivation of organizational members through their own involvement in

decision making. Participation by rank-and-file members in the decision

making process should increase their stake in the decisions and therefore

increase their motivation to achieve the goals of the organization

(Tannenbaum and Bachman, 1964).

The concept of total control in an organization is related to the

"organic" versus the "mechanistic" conceptualizations of Burns and

Stalker (1961). An organic system is characterized by knowledge of the

overall task structure of the organization by all members and by a

highly coordinated response of the organization to changes, which implies

a high degree of control by and over organization members. A mechanistic

system, on the other hand is characterized by a tall hierarchy of authority

and specialization of subtasks, where responsibility for the relevance of

subtasks rests at the top of the organization. Within this type of system,

then, there is less total control in the organization than under an organic

system.

As a technique for representing various aspects of the control structure

of organizations, Tannenbaum (1956; Tannenbaum and Gerogopoulos, 1957)

developed the "control graph." A "control graph" is a graphic representation

of the amount of control exercised by each of several hierarchical levels

within the organization. It is constructed by plotting descending hierarchical

levels along the abscissa versus the amount of control exercised by each level

along the ordinate. The amount of control exercised at each level is typically

measured by asking members of the organization to rate on a five point scale

the amount of say or influence each hierarchical level has over what goes on in

the organization. The control exercised by each level is then simply the mean

rating for that level.

A control graph yields two types of information about the control structure

of an organization. First, the total control in the organization is represented

by the height of the control curve. Secondly, distribution of control among

various levels of the organization is represented by the slope of the control

curve. Thus, a "flat" control curve would represent an organization in which

control is equally distributed among different levels of the organization,

while a positively or negatively sloped curve would represent an organization

in which control is distributed unequally among organizational levels.

The first investigation employing the control graph technique was a study

of four union locals (Tannenbaum, 1956). In these union locals control was

measured at four levels: the president, the executive board, the plant

bargaining committee, and the rank-and-file membership. The results showed

that the degree of member participation in union affairs (including meeting

attendance, raising and seconding motions, working on committees, voting in

union elections, etc.) was positively related both to the total amount of

control in the local and to the degree of democratic control in the local

(measured by the degree of positive slope of the control curve). Furthermore,

there was a positive relationship between the amount of democratic control

and union interest in broad general social goals, as opposed to immediate

bread-and-butter goals. Finally, the total amount of control in the local

was positively related to loyalty of members, conformity to group norms, and

to the amount of union-management conflict.

A later study (Tannenbaum, 1961) was designed to test two propositions

relating control structure of the organization to effectiveness. The first

hypothesis was that organization effectiveness would be positively related

to the degree of positive slope of the control graph (i.e., the degree to

which the distribution of control was democratic). This hypothesis was

developed from two lines of reasoning. First, having say in the organization

may tend to move the organization in directions which satisfy the needs of

rank-and-file members. Secondly, control by lower echelons would lead to

greater acceptance of jointly made decisions and would increase the felt

responsibility for those decisions. These two influences would lead to greater

effectiveness in the organization under democratic control.

The second hypothesis tested by Tannenbaum (1961) was that organizational

effectiveness would be positively related to the total amount of control in

the organization, because greater control would lead to greater coordination

of effort in a goal-related direction.

The study was conducted on 104 local leagues of women voters. Within

each league, control was measured at 3 levels: the president, a board of

directors, and the rank-and-file. The effectiveness of each league was rated

by up to 29 persons from the national headquarters. The results showed

significant positive relationships between slope of the control curve and
effectiveness and between total control and effectiveness of the league
(correlations of .31 and .29 respectively). Furthermore, slope and total
control were virtually uncorrelated (.14), so their effects on league
effectiveness were largely independent. That is, using both slope and
total control to predict effectiveness produced a multiple-R of .42.

Smith and Tannenbaum (1963) did a comparative analysis of the control
structures of different types of organizations. Their analysis attacked
three major problems: 1) a comparison of the control graphs of different
types of organizations; 2) exploration of differences between officers' and
members' actual control and ideal control and how these differences vary
from organization to organization; and 3) comparison of the relationships
between aspects of control structure and effectiveness in various organi-
zations. Among the organizations studied were 32 stations of a delivery
company, 36 auto dealerships, a manufacturing plant, 2 power plants, 104
leagues of women voters, and 5 union locals. A number of interesting results
emerged from this study. First, all business organizations had a negatively
sloped control graph, that is, control was higher at higher levels of the
organization than at lower levels. Furthermore, the ideal slope for members
and managers was positive for voluntary organizations and negative for business
organizations. The total amount of control in the organization was found to be
positively related to effectiveness in the voluntary association, in union
locals, and in the delivery company, but there was no relationship between
total control and effectiveness in the auto sales firms. One reason for the
lack of positive relationship between total control and effectiveness in auto
dealerships may be that performance is not dependant upon coordination but
rather on independent individual performance. Finally, the slope of the control

graph was found to be positively correlated with performance only for the

voluntary organizations.   There was no relationship between slope and

performance in the other organizations.

These findings are interpreted as confirming the notion that high total

control is associated with an organization in which there is a high degree of

interaction and influence within and between hierarchical levels, leading to

more efficient task activity and more motivation on the part of individuals

within the organization.

Although the research of Tannenbaum and his associates has taken place

in a number of organizational settings, very little empirical research has been

done on the control structure of university departments, probably for many

of the reasons outlined above.

A recent study by Harrison (1970) bears somewhat on the question of

control structures in universities. This study was designed to test the effects

of "organic" versus "mechanistic" systems of control on the rated performance

of research laboratories. The study was based in part on the theoretical work

of Burns and Stalker (1961) which resulted in the prediction that the more

organic the organization, the higher would be the perceived role performance

of researchers in the lab.

A number of indicator variables, including participation in organizational

decision making,were used to assess the position of each of the three labs

studied on a dimension of "organic" vs. "mechanistic" organization. The

results of the study confirmed the hypothesis in that the more "organic"

the system, the greater the perceived performance of the lab on three of the

four measures of perceived role performance. Since "organic" orientation

implies a high degree of total control in the organization, these results can

be seen as being in accord with the general findings of Tannenbaum.

Using the control graph technique, Hill and French (1967) measured the
control exercised by five groups in a university setting. The five groups were
the board of trustees, higher administrators, deans, department chairmen,
and professors. As was expected, the control graph was relatively flat;
that is, department heads and professors were seen as having almost as much
control over what goes on in the department as the deans and higher administrators.
These results are not surprising given the common lore about the relative
independence of university departments from one another and from higher
administration within the university. It would seem reasonable, then, that
a study of control in university departments should focus on the distribution
of control and the total amount of control within the department.

In light of these results, the present study was undertaken to analyze
the effects of control structure within university academic departments on
productivity and satisfaction of departmental faculty members. Because
university departments do not have formally designated management hierarchies,
which typify other types of organizations, it was decided to split departmental
faculty members into two groups, tenured faculty and nontenured faculty.

There are several obvious differences between these two groups. Primarily,
tenured faculty members are those individual who have been in the department,
or at least in the profession, for a number of years, who have relatively
stable positions within the department, and who are commonly considered the
"leaders" in the department (in an expert and referent sense). Nontenured
faculty, on the other hand, are primarily recent Ph.D.'s who are just starting
their careers, and who are normally considered to have less influence in the
department than tenured faculty.

"Control structure" for the present study, then, refers to the distribution of control among tenured and nontenured faculty members and the total amount of control exercised by both groups.

With respect to the distribution of control among tenured and nontenured faculty members, two departmental prototypes were defined. One was the department in which the distribution of control among tenured and nontenured faculty was egalitarian. In departments of this type, nontenured faculty members exercised nearly as much control as tenured faculty members in the department. The second type of department was defined as an hierarchical department, in which the control exercised by tenured faculty was considerably greater than the control exercised by nontenured faculty.

Total control in the department referred to the sum of the control exercised by tenured faculty and the control exercised by nontenured faculty. The control structure of a department was then defined as its joint classification into egalitarian vs. hierarchical distribution of control and high vs. low total control.

Six hypotheses for the present study were derived from the previous work of Tannenbaum and his associates on the control structure of organizations (c.f., Tannenbaum, 1968). Hypotheses 1 and 2 followed almost directly from the results of these studies.

Hypothesis 1. Departmental outputs will be positively related to the degree to which the distribution of control in the department is egalitarian.

Hypothesis 2. Departmental outputs will be positively related to the total amount of control exercised by faculty members in the department.

One criticism that can be made of previous research on control structure is that each variable, total control and distribution of control, has been

correlated with productivity and satisfaction. This procedure is suitable

for investigating main effects of these two factors on productivity, but it

precludes the possibility of detecting interaction effects of the two aspects

of control structure. In discussing the results of his study of leagues of

women voters, Tannenbaum (1961) hints at the possibility of interaction effects

of total control and distribution of control, but the author could find no

subsequent study in which this possibility was examined by an appropriate

statistical design. Furthermore, it seemed that an interaction effect of

these two variables on productivity would not be unreasonable. For example,

an oligarchic department may require a great deal of total control to maintain

order and coordination of effort because of low involvement and motivation at

lower levels. In democratic departments, on the other hand, nontenured

faculty participate more in decision making and hence would be expected to

have higher motivation and loyalty. Here it may be that less total control

is needed for effective operation.

One additional variable which may be expected to interact with aspects

of control structure in determining output is departmental size. For example,

a greater amount of total control may be needed to maintain coordination of

effort in large departments than in small departments. From these and the

above considerations, the following hypothesis was derived for the present study:

Hypothesis 3. There will be interaction effects of total control and

distribution of control on departmental output as well as interaction effects

of department size and control structure on departmental performance.

The next three hypotheses are similar to the first three and apply to the

relationships between control structure and faculty satisfaction.

Hypothesis 4. Faculty satisfaction in the department will be positively
related to the degree to which the distribution of control in the department
is egalitarian.

Hypothesis 5. Faculty satisfaction in the department will be positively
related to the total amount of control exercised by tenured and nontenured
faculty members in the department.

Hypothesis 6. There will be interaction effects of total control and
distribution of control on faculty satisfaction in the department as well as
interaction effects of department size and control structure on departmental
satisfaction.

Method

The Setting

This study was conducted as part of a larger study at the University of
Illinois, Urbana campus starting in the Spring of 1968. The University of
Illinois is a large state-supported, land-grant institution, with a heavy
emphasis on research and graduate education. The Urbana campus has an annual
enrollment of approximately 32,000 undergraduate, graduate, and professional
students, with an academic faculty exceeding 3,000 in number.

An initial sample of 56 academic departments was selected for inclusion
in the study. Only departments which offered graduate programs leading to
the Ph.D. degree or its equivalent were selected for the study. This
limitation was imposed because one of the objectives of the overall project
was to investigate factors related to the effectiveness of graduate education
in university departments. The executive officer of each department was
contacted and interviewed in order to explain the purposes of the study and

to obtain cooperation of the department in the study.

Sources of Data

The data for this study came from four sources: an extensive
questionnaire completed by faculty members, archival records of the University
of Illinois Bureau of Institutional Research, a pamphlet distributed annually
by the University of Illinois entitled Publications of the Faculty, and
additional ratings made by selected faculty members. Webb, Campbell, Schwartz,
and Sechrest (1966) point out the necessity of utilizing different sources
of data in a field study in order to avoid the possibility of having the
same sources of error in all measures used in the study. The fact that a
number of "unobtrusive" measures were used should strengthen the present
study.

The Questionnaire. In the spring of 1968, a questionnaire was distributed
to all faculty members with rank instructor or abovein 56 academic departments
at the University of Illinois. Three or four weeks after distribution of the
questionnaire, a follow-up letter was sent to all faculty members who had not
yet returned the questionnaire. After an additional two weeks, a telephone
follow-up was conducted in an attempt to entice nonrespondents to return the
questionnaire. The cooperation of departments in the study varied greatly
from department to department. The departmental return rates on the
questionnaire ranged from 19% to 100%. The overall return rate was about 54%.

The relatively low return rate immediately raised the question of the
selectivity of the sample of faculty members who did respond to the
questionnaire. One test of the representativeness of the sample of respondents
was available through a comparison of respondents and nonrespondents on five
variables obtained through the University of Illinois Bureau of Institutional

Research. These data were concerned with various aspects of the formal appointment of each faculty member in the department and with characteristics of each faculty member. The variables were academic rank, highest degree earned, total university Full Time Equivalent (FTE), percent appointment in the department, and Full Time Equivalent on Teaching. These data were entered into a three-way classification defined by the following three factors: (1) response condition: respondent vs. nonrespondent; (2) appointment in a department with a high response rate vs. appointment in a department with a low response rate; and (3) academic area, defined by hard sciences, soft sciences, and humanities. A three-way analysis of variance was applied to each variable, and the results indicated a significant relationship beyond the .05 level of probability between response condition (respondent vs. nonrespondent) and four of the five variables. The only variable not significantly related to response condition was academic rank. For the other four variables, respondents were significantly higher than nonrespondents. Thus, respondents had more advanced degrees, had higher total appointments in the university, had higher appointments in the department, and had higher Full Time Equivalent teaching appointments than nonrespondents.

In addition to the main effects of response condition, there were also significant interactions between academic area and response condition on these four variables. Examination of the cell means for these interactions indicated that the differences between respondents and nonrespondents were in the same direction for all three academic areas, but the differences were most pro-nounced for soft sciences and least pronounced for humanities.

At first glance, these results were distressing in their implications for the representativeness of those who responded to the questionnaire.

However, these analyses were conducted on data from 884 faculty

members. With such a large sample, small differences would be

statistically reliable. Estimates of the proportion of variance of

each variable accounted for by the respondent-nonrespondent factor were

computed, and the largest was 2.2%, with the smallest being 0.7%.

These differences are so small that they should be of little consequence

for the question of the representativeness of the sample of respondents.

However, it was still considered necessary to eliminate some of

the departments with very low response rates from further analyses.

Since questionnaire responses were used to measure department-level

concepts, it was necessary that respondents from each department

be as representative of the department as possible. For this reason,

departments with a return rate of less than 40% were dropped from

further analysis. This left 37 departments with response rates of at

least 40%, which comprised the sample for this study.

Two sets of variables relevant to the present study were measured

by the questionnaire. The first was a measure of the control

structure of each department. Tannenbaum (1968) defined control as

any process by which the behavior of an individual or group of

individuals is intentionally affected by another person or group of

persons. It seems reasonable to argue, then, that one means of exercising

control in a university department would be to participate in

the administrative and decision making process within the department.

In describing the concept of control, Tannenbaum (c.f., 1968, p. 10)

repeatedly referred to participation by members of the organization in the

decision making process. Thus, a measure of participation by members of

the organization in organizational administration and decision making should

be a reasonable measure of control in the organization.

For the present study, the following question was used to measure the

amount of control exercised by each faculty member in the department: "How

would you rate your own participation in departmental administration and

decision-making?" Responses were made on an eight point scale ranging from

"very little participation" to "a great deal of participation." Some

support for the validity of this measure as a measure of the control process

was reported by DeVries (1970) in another phase of this project. He found

that individual responses to this item correlated positively with FTE

administration (the proportion of a faculty member's contract which is paid

for administrative work), with the value the individual placed on administrative

work, and with the proportion of time the individual spent on administrative

work. Thus, individual ratings of participation in administration and

decision making appear to be valid indicators of the degree to which the

individual is involved in the control process in the department.

The two aspects of departmental control structure, total control and

distribution of control, were measured as follows: For each department, the

average response to this item was computed separately for tenured faculty and

for nontenured faculty. Total control in the department was taken as the

sum of these two means, that is, the sum of the average control exercised

by nontenured faculty and the average control exercised by tenured faculty.

Distribution of control in the department was measured as the slope of the

the departmental control graph, with tenured faculty and nontenured faculty as

the two groups. The slope of the graph was computed simply as average control

for nontenured faculty minus average control for tenured faculty. As has

been the case in most of the previous work on control structure (c.f., Smith

and Tannenbaum, 1963), the slopes of the departmental control graphs were

predominantly negative (ly three departments had a positive slope). The

slope of the control graph provided an index of the degree to which control

was equally distributed among tenured faculty and nontenured faculty (i.e.,

a zero slope) reflecting an egalitarian distribution of control, versus

unequally distributed, with more control exercised by tenured faculty than

nontenured faculty (i.e., a negative slope), reflecting an hierarchical

distribution of control.

The control structure of a department was then defined as the joint

classification of the department into high vs. low total control and high vs.

low positive slope of the control graph (egalitarian vs. hierarchical

departments, respectively). Both total control and slope of the control

graph were dichotomized at the mean of the distribution. This provided a

2x2 classification of departments on the basis of control structure. This

2x2 classification was further broken down by department size, large vs.

small, resulting in a 2x2x2 classification. The design and the number of

departments classified into each cell of the design are presented in Figure 1.

Insert Figure 1 about here

Faculty satisfaction was measured by responses to seven items on the

questionnaire requesting faculty members to indicate the degree to which

they are satisfied with each of the following aspects of their job situation:

organization of administrative functions in the department, personal relations

Slope of
Control Graph

Small Departments

low   high

	low	high
Total Control high	N=5	N=4
Total Control low	N=7	N=4

Slope of
Control Graph

Large Departments

low   lligh

	low	lligh
Total Control high	N=4	N=3
Total Control low	N=5	N=5

Figure 1. Statistical design for control structure analyses.

with colleagues, present position, progress toward personal goals, and

present job in light of career expectations. Each satisfaction rating was

made on an eight point scale ranging from "very satisfied" to "not at all

satisfied."

Publications of the Faculty. Each year, the University of Illinois

releases a pamphlet entitled Publications of the Faculty. This pamphlet

lists for each faculty member of the University of Illinois all of his

publications for the previous year. Publications listed include journal

articles, books, book reviews, and technical reports. Also included in the

listings are doctoral dissertations which were chaired by each faculty member.

Much of the output data for the present study was taken from this pamphlet.

For each faculty member the numbers of each of the following outputs

over the five year period from 1964-1968 were tallied: textbooks, monographs,

professional journal articles, technical reports, book reviews, and "other"

publications, as well as the number of dissertations chaired. The category

"other" publications contained primarily edited books, with the inclusion of

a very few published poems and short stories. For each department, the total

number of each of these seven categories of outputs was computed for the five

year period. For the thirty-seven departments included in this study, this

data represented over 1400 faculty members.

Quality of Journals. As a measure of the quality of research output,

an index was derived for this study entitled the Quality of Journals Index

(QJI). Because of the very large numbers of journal articles published by

faculty members in the sample over the five year period, it was considered

prohibitively costly and time-consuming to have each article rated as to its

quality. Thus, the following procedure was adopted: It was assumed that within

any academic discipline, the various journals available for publishing

articles in that field each have some minimum editorial standard of

excellence for accepting an article for publication. Furthermore, it was

assumed that this minimum standard varies from journal to journal. With

these assumptions, we were able to develop an index of quality of journal

articles based on the rated quality of journals in which articles were

published.

To obtain ratings of all journals within each field, lists were first

compiled of all journals in which faculty members in each field had published

articles during the years 1964-1968. Then the executive officer of each

department was contacted and was requested to supply the names of five or

six faculty members from his department, whom he considered knowledgeable

in the field, and who represented the various subdisciplines in the field.

These faculty members were then sent a questionnaire with a cover letter

signed by an associate dean of the Graduate College at the University of

Illinois. The questionnaire contained a list of all journals in which faculty

members in the field had published articles during the years 1964-1968. The

respondent was requested to rate each journal on a five point scale as to

its quality. The ratings of quality ranged from "excellent" to "poor". If

a judge were unacquainted with a particular journal, he was requested to

indicate so and not to rate the journal. After a telephone follow-up, a

91% return rate was obtained on this questionnaire.

A quality score was computed for each journal by assigning numerical

values of 1 to 5 to the five quality categories and then taking an average of

the ratings for that journal. Given these journal quality scores, a quality

of journal articles score for each department was constructed in the

following manner: For each journal article published by faculty members in

the department, the journal in which it was published was noted, and the

quality rating of that journal was recorded. Because of the obscurity of

some of the journals, there were no ratings available for these journals.

The number of articles published in unrated journals, however, turned out to

be a very small proportion (10%) of all of the articles published, so

these articles were dropped for the calculation of quality. The quality

ratings for all articles in the department were then summed and the total

was divided by the number of articles entering into the total. The

resulting number was the Quality of Journals Index for the department. An

interrater reliability estimate for the Quality of Journals Index was obtained

by determining the median interjudge correlation among ratings across

journals within each area. The median interrater correlation across areas

was .484.

Quality of First Jobs. One of the primary functions of a graduate

department is to procure Ph.D.'s who are well-educated, competent scholars.

An index was derived for this study, which was designed to assess the degree

to which a department was successful in meeting this goal. The index, called

the First Job Index (FJI), outlined in detail by Fiedler and Biglan (1969),

is based on ratings of the quality of first jobs obtained by graduating

Ph.D.'s from the department. Several assumptions were necessary in constructing

this index. First, it was assumed that a graduating Ph.D. will seek and

accept the best possible job that he can obtain. Furthermore, it was

assumed that university departments seeking new candidates for positions

will accept the most qualified candidate who has applied for a position.

With these assumptions, it is reasonable to conclude that on the average, the

most qualified candidates will go to the best institutions, and the least

qualified candidates will obtain lesser quality jobs. The FJI, then, was

obtained by having faculty members rate the quality of first jobs obtained

by recent graduating Ph.D.'s.

Specifically, lists were obtained from the files of each department

of the first jobs obtained by graduating Ph.D.'s from the years 1964-1967.

These lists were then sent to about six faculty members from each department

who had been nominated by the departmental executive officer. The judges

were required to rate each job as to its desirability as a first position for

a graduating Ph.D. from the department. Names of the students who had

obtained the jobs were not included with the lists of jobs. Furthermore,

only positions obtained by males in the United States were included, since

females are more likely to be influenced by where their husbands go than by

the desirability of availble jobs. Also, it was assumed that raters would

not be sufficiently familiar with foreign jobs to rate their desirability.

Ratings of job desirability were made on a scale ranging from "very

desirable" to "very undesirable." To compute the FJI for a department, the

average rating of each job was computed, and then the job ratings were

averaged to give an overall index.

An obvious problem with this index is the possibility that faculty

members at the University of Illinois might have a tendency to rate the

quality of jobs obtained by their own alumni as being higher than would

"unbiased" raters. To check for this possibility, the lists of jobs from

six of the departments in the sample were rated by six faculty members in

each of the corresponding six departments at the University of Washington.

T-tests indicated that the average ratings made by University of Washington

faculty members did not differ significantly from the ratings made at the
University of Illinois. Furthermore, the ratings made by Washington faculty
were consistently _higher_ (again, not significantly so) than the ratings
made at Illinois. Thus it appears that a "bias" was not operating in the
ratings made at Illinois.

In addition, for each of the six departments, the ratings made at the
two institutions were correlated across jobs within each department. The
median of the six correlations was .75, indicating that the First Job Index
has satisfactory interinstitutional reliability.

Analysis of the Data

For all statistical analyses involving the control structure of
departments, departmental scores on the dependent variables were classified
into the eight cells of the statistical design described above. Since the
number of departments was not equal or proportional across cells of the
design, an unweighted means analysis of variance was applied to the variables
being analyzed. This analysis allowed for tests of both main effects of
total control and distribution of control,and interactions between these
two factors and department size.

Results

Reliability of the Control Measures

Because the measures of total control and distribution of control were
key measures for the present study, it was considered essential to evaluate
the reliability of these measures. A split-half procedure was employed.
For each department the tenured faculty and nontenured faculty were randomly
split into two groups. The average control scores were then computed

separately for each of the two groups of tenured faculty and nontenured
faculty. Then two estimates of total control and slope of the control graph
were computed for each department by combining the data for the two subjects
of the tenured faculty and nontenured faculty in the appropriate manner.
These two estimates of each control measure was then correlated across
departments, and the correlations were corrected for test length by the
Spearman-Brown formula. The resulting reliability estimates were .61 and
.68 for total control and slope of the control graph respectively. While
these estimates were somewhat low, the two measures were considered
sufficiently reliable to warrant further analysis.

Tests of the Major Hypotheses

Hypotheses 1, 2, and 3. Hypothesis 1 predicted a positive relationship
between degree of positive slope of the control curve and departmental
effectiveness; that is, departments with an egalitarian distribution of control
were predicted to have higher output than departments with an hierarchical
distribution of control. Hypothesis 2 predicted a positive relationship
between total departmental control and departmental output. Hypothesis 3
predicted that distribution of control (slope) and total control would
interact with each other and with department size in determining departmental
output. Before testing these hypotheses, it was necessary to make some
transformations on departmental publication data.

The original publication data consisted of raw numbers of each of seven
classes of publications completed in each department for the years 1964
through 1968. Because the departments in the sample varied a great deal in
size, raw numbers of publications would be highly dependent upon the size of
the department. To correct for the effect of department size, the raw

numbers of each type of publication were divided by the number of faculty

members in the department, resulting in per capita output scores.[2] An

examination of the distributions of department per capita output scores revealed

that the distributions were highly skewed right; that is, there were many

departments with few outputs per faculty member and few departments with

high per capita output. In order to provide distributions of scores more

compatible with the assumptions of the analysis of variance, the per capita

scores were transformed by a logarithmic transformation first used by

Pelz and Andrews (1966) for a similar purpose. The transformation was of the

form:

$$X_t = 1.0 + \log_e (X + 0.5), \tag{1}$$

where X is the original score, and X_t is the transformed score. The 0.5 was

added to the original score to avoid having to take a logarithm of zero,

and the constant 1.0 was added to the logarithm to avoid the inconvenience

of negative scores. Each of the following per capita output measures was

transformed via equation (1): textbooks, monographs, articles, dissertations

chaired, technical reports, book reviews, and other publications.

Significant F-ratios from the analysis of departmental outputs by

control structure are presented in Table 1. The relevant cell means are

presented in Table 2. The relationship between control structure and

departmental outputs was significant at the .05 level or better for three

departmental outputs. Main effects of total control and control slope will be

discussed first, followed by a discussion of interactions.

Insert Tables 1 and 2 about here

TABLE 1

Relationships between Control Structure

and Departmental Outputs

Variable	Factor[a]	F	p	% Var.
Journal Articles	B	13.77	.001	27
	AxB	5.20	.05	10
Other Publications	B	5.47	.05	14
Dissertations	AxB	6.08	.05	14

[a]Factor A = control slope
Factor B = total control

TABLE 2

Cell Means for Departmental Outputs

Variable		Cell Means	
Journal Articles		Low Total Control	High Total Control
	Hierarchical	2.50	1.42
	Egalitarian	1.89	1.63
		2.19	1.52
Quality of Journals Index		Low Total Control	High Total Control
	Hierarchical	4.19	4.00
	Eqalitarian	3.90	4.15
Other Publications			
	Hierarchical	.49	
	Eqalitarian	.40	
	Low Total Control	.39	
	High Total Control	.50	
Dissertations Chaired		Low Total Control	High Total Control
	Hierarchical	1.42	.96
	Egalitarian	1.02	1.14

Main effects. There were significant main effects of total control

for two output variables, log per capita journal articles and log per

capita "other" publications. The means for the main effect of total control

on per capita journal articles reveal that the relationship was in the

opposite direction of that predicted by Hypothesis 2; departmental output of

journal articles was negatively related to total control. This main effect

accounted for 27% of the variance in log per capita journal articles.

The main effect of total control on "other" publications was in the

predicted direction, however. Total control in the department was positively

related to production of "other" types of publications. As was pointed out

in the previous section, this category of publications consisted primarily

of edited books, with the addition of a few published poems and short stories.

There were no main effects due to distribution of control.

Interactions of total control and slope. There was a significant

interaction between total control and slope of the control graph for two

output variables: log per capita journal articles and log per capita

dissertations. From examination of the cell means for these interactions

in Table 2, one clear pattern emerges; in departments for which there is an

hierarchical distribution of control (low slope), there is a negative

relationship between total control in the department and output; the higher

the total control, the lower the output. This negative relationship between

total control and output was substantiated in tests of simple main effects

of total control for hierarchical departments for both log per capita journal

articles ($t = 3.95$, d.f. $= 17$, $p < .002$) and for log per capita dissertations

chaired ($t = 2.53$, d.f. $= 17$, $p < .05$).

In departments with an egalitarian distribution of control, the negative relationship between total control and output did not occur. None of the tests of the simple main effect of total control on output for egalitarian departments reached an acceptable level of significance. It appears from these results that whatever disadvantages arise from a high amount of total control in a department are overcome if the control in the department is distributed in an egalitarian fashion among tenured and nontenured faculty members.

These results are in support of Hypothesis 3. Total control and distribution of control do interact in their effects upon departmental outputs. Variation in either factor alone is apparently not sufficient information to predict variation in departmental output.

Interactions with department size. In the analysis of department outputs, no significant interactions occurred between aspects of control structure and department size. Therefore, that portion of Hypothesis 3 predicting interactions with department size was not supported.

In a further attempt to analyze the relationships between control structure and output, individual publication data were submitted to the same analysis of variance as were the departmental output data. Each individual faculty member was classified into the design according to the control structure and size of the department in which he had an appointment. In all, there were 1433 individuals included in the analysis. Because they were distributed unequally among the eight cells of the design, an unweighted means analysis was again employed. The individual level analysis was applied to each of nine variables: textbooks, monographs, articles, dissertations chaired, technical reports, book reviews, other publications, First Job Index,

and Quality of Journals Index.

For the first seven outputs listed, the distributions were once again
highly skewed right; that is, many individuals had few publications, while
relatively few individuals had large numbers of publications. Therefore, the
same transformation was applied to these individual output scores as was
used on the departmental output scores. This logarithmic transformation is
defined by equation 1 above.

For the First Job Index, the analysis was performed only for individuals
who had chaired at least one doctoral committee and had at least one student
placed in a job, resulting in an N of 176 for this analysis. The Quality of
Journals Index was computed only for individuals who had published at least
one article in the five-year period of 1964 to 1968, resulting in an N of 735
for this analysis.

The significant F-ratios from the individual level analyses are presented
in Table 3. The cell means associated with these results appear in Table 4.
As can be seen from Table 3, there were a number of significant relationships
between control structure and individual outputs. Although these relationships
were highly reliable statistically, it can be seen that they accounted for
only small portions of the variance in the output measures, with none exceeding
five percent. It is important to keep this in mind when interpreting these
results. Here again, main effects will be discussed first, followed by a
discussion of interaction effects.

Insert Tables 3 and 4 about here

Main effects of control slope. Significant main effects of slope of the

TABLE 3

Relationships between Control Structure

and Individual Outputs

Variable	Factor[a]	F[b]	P	% Var.
Monographs	AxB	6.92	.01	<1
	AxBxC	6.80	.01	<1
Journal Articles	B	80.02	.001	5
	BxC	6.81	.01	<1
Technical Reports	A	13.77	.001	1
Book Reviews	A	8.12	.005	1
	AxC	12.59	.001	1
	AxBxC	11.82	.001	1
Other Publications	B	12.57	.001	1
Quality of Journals Index	B	6.96	.01	1
	AxB	9.10	.005	1
	BxC	8.53	.005	1

[a]Factor A = control slope
 Factor B = total control
 Factor C = department size

[b]F-ratios for all variables except QJI are for 1,1425 d.f. For QJI
 the F-ratios are for 1,727 d.f.

TABLE 4

Cell Means for Individual Outputs

Variable	Factor	Cell Means		
Monographs	AxB		Low total control	High total control
		Hierarchical	.23	.21
		Egalitarian	.08	.21
	AxBxC	small departments		
			Low total control	High total control
		Hierarchical	.33	.23
		Egalitarian	.08	.29
		large departments		
			Low total control	High total control
		Hierarchical	.13	.18
		Egalitarian	.08	.13

Variable	Factor	Cell Means	Small departments	Large departments	
Journal Articles	B, BxC				
		Low total control	2.14	2.07	2.10
		High total control	1.57	1.02	_.30
Technical Reports	A	Hierarchical	.14		
		Egalitarian	.26		
Book Reviews	A, AxC		Small departments	Large departments	
		Hierarchical	.37	.47	.42
		Egalitarian	.40	.16	.16

Table 4 (continued)

Variable	Factor	Cell Means		
Book Reviews	AxBxC	**Small departments**		
			Low total control	High total control
		Hierarchical	.43	.31
		Egalitarian	.28	.53
		Large departments		
			Low total control	High total control
		Hierarchical	.35	.59
		Egalitarian	.19	.14
Other Publications	B	Low total control	.04	
		High total control	.12	
QJI	B, AxB		Low total control	High total control
		Hierarchical	3.72	3.21
		Eqalitarian	3.38	3.42
			3.55	3.31
	BxC		Small departments	Large departments
		Low total control	3.44	3.67
		High total control	3.46	3.17

control graph occurred for log technical reports and for log book reviews.

For log technical reports, the cell means were in the direction predicted by

Hypothesis 1. Individuals in departments with an egalitarian distribution of

control produced more technical reports than did individuals in departments

with an hierarchical distribution of control. The results for book reviews

were in the opposite direction, however. There was a negative relationship

between slope of the control graph and individual output of book reviews. Thus,

it appears that the distribution of control in departments affects different

types of outputs in different manners.

Main effects of total control. There were significant main effects of

total control on individual output of journal articles and "other" publications,

as well as for Quality of Journals Index. Total control had different effects

on these variables. For log journal articles, the relationship between total

control and individual output was negative. Individuals in departments with

high total control produced fewer articles than did individuals in departments

with low total control. This result is contrary to the prediction of

Hypothesis 2 and is in accord with the relationship of total control to

output of journal articles found at the departmental level. This individual

level relationship is the strongest relationship found at the individual level,

accounting for five percent of the variance in log journal articles.

For "other" publications, the results support Hypothesis 2, as did the

same results at the departmental level. The higher the total control in the

department, the higher the individual output of other types of publications.

For the Quality of Journals Index, the relationship between total control

and output was again negative, contrary to Hypothesis 2. The higher the total

control, the lower the individual Quality of Journals Index score.

Interactions of total control and slope. Significant interactions

occurred between total control and control slope for two individual level

variables, log monographs and Quality of Journals Index. For log monographs,

the cell means for the AxB interaction indicate that in departments with an

egalitarian distribution of control, there is a positive relationship between

total control and output of monographs. There is apparently no relationship

between total control and individual output of monographs in departments

where the distribution of control is hierarchical.

The shape of the slope by total control interaction effect on individual

Quality of Journals Index is consistent with a pattern that was observed at

the departmental level; there was a negative relationship between total

control and individual Quality of Journals Index for departments with an

hierarchical distribution of control, while there was no relationship between

total control and individual Quality of Journals Index for departments with

an egalitarian distribution of control.

It is interesting to note that all but one of the significant interactions

reported between total control and distribution of control at both the

departmental and individual level had a similar pattern. The relationship

between total control and output did not appear for departments with an

egalitarian distribution of control, whereas for departments with an

hierarchical distribution of control, this relationship was negative. This

pattern was observed at the departmental level for output of articles and

dissertations and for the Quality of Journals Index and at the individual

for output of book reviews in small departments. The only instance for which

this general pattern did not hold was for output of book reviews in large

departments.

In general, then, it appears from this consistent pattern of results that a large amount of total control in a department is detrimental to the production of certain outputs, and that this detrimental effect of high total control is overcome if the control in the department is distributed in an egalitarian fashion among tenured and nontenured faculty members.

Interactions with department size. An outcome of the individual analyses, which did not occur at the departmental leve   as a number of interactions between aspects of control structure and aepartment size. Significant interactions between control structure and department size occurred for four individual output variables.

The three-way interaction between control slope, total control, and department size was significant for log monographs. Examination of the cell means for this interaction in Table 4 indicates that the slope by total control interaction effect on log monographs reported above was more pronounced for small departments than for large departments. There was much greater spread in cell means for small departments than for large departments.

For log journal articles, total control interacted significantly with department size. The cell means indicate that the negative relationship between total control and log journal articles was stronger for large departments than for small departments.

The significant interaction between control slope and department size for log book reviews reveals that the negative effect of slope on log book reviews occurred only in large departments. Thus, in large departments an egalitarian distribution of control resulted in lower production of book reviews than did an hierarchical distribution of control. Egalitarian and hierarchical departments did not differ in output of book reviews for small artments.

In addition to the two-way interaction between slope and department size, there was a significant three-way interaction for log book reviews. Table 4 displays this interaction as two-way interactions between slope and total control presented separately for small departments and large departments. These interactions between slope and total control fit the general pattern thus far observed only for small departments. There was a negative relationship between total control and output for hierarchical departments and a positive relationship between total control and output for egalitarian departments. In the large departments, the pattern was different. Here, there was a positive relationship between total control and output in hierarchical departments and no relationship in egalitarian departments. The reason for this departure from the general pattern is not clear.

Finally, total control interacted significantly with department size for QJI, Here, there was a negative relationship between total control and output in large departments, with no relationship between total control and output for small departments. This result, coupled with the interaction effect of slope and total control on QJI indicates that at least for QJI, performance is affected by total control in departments with an hierarchical distribution of control and in large departments. Furthermore, the relationship between total control and QJI for these departments is negative; the higher the total control, the lower the average individual QJI.

It is concluded that Hypothesis 3 has received considerable support from the results presented thus far. Several interaction effects of control slope and total control on output have been reported at both the departmental level and the individual level. Furthermore, at the individual level, aspects

of control structure were seen to interact significantly with department
size, indicating that control structure has varying effects upon individual
output, depending upon the size of the department.

Hypotheses 4, 5, and 6. Hypotheses 4, 5, and 6 dealt with the relationships
between aspects of control structure and satisfaction and climate within the
department. Hypothesis 4 predicted a positive relationship between the degree
of positive slope of the control curve and satisfaction and climate.
Hypothesis 5 predicted that satisfaction and departmental climate would be
positively related to the total amount of control in the department. Finally,
Hypothesis 6 forecast interactions between control slope and total control
and between aspects of control structure and department size in affecting
satisfaction and departmental climate.

The results of statistical tests of Hypotheses 4, 5, and 6 were clear:
there was no relationship, either main effect or interaction effect, between
departmental control structure and any measure of faculty satisfaction. Thus,
these hypotheses failed to receive support from the data for this study.

Discussion

The results of the present study provide strong evidence for the importance
of departmental control structure as a factor related to both departmental
and individual output in university departments. A great deal of previous
research has been conducted on the general problem of control processes on
organizations (c.f., Tannenbaum, 1968). The present study was designed to
extend the previous research and provided at least three innovations over
previous studies: 1) It extended the research into a new setting, the
university. 2) The study employed a statistical design which allowed for

tests of interaction effects of total control and distribution of control

on outputs, as well as interactions between these control variables and

department size in affecting departmental output. These interactions were

not tested in previous studies, and they turned out to be the most inter-

esting results of the present study. 3) Finally, the present study

provided tests of the effects of departmental control structure on indi-

vidual outputs as well as on departmental outputs. Previous studies had

dealt primarily with organizational effectiveness.

The results of the present study indicated that the relationships

between departmental control structure and other system variables in

university departments are, at best, complex. This section will examine

the main findings of the present study and will attempt to shed some

interpretive light on these findings.

Relationships between Control Structure and Departmental Outputs

Three of the major hypotheses of the present study predicted specific

relationships between departmental control structure and departmental output.

Results of tests of these hypotheses will be discussed in this section.

1. Main effects of total control.

Hypothesis 2 predicted a positive relationship between total control

and output. This relationship has been observed in a number of different

types of organizations (Smith & Tannenbaum, 1963). Main effects of total

control were observed at both the departmental level and the individual

level for output of journal articles and "other" publications, and total

control in the department was also significantly related to the Quality of

Journals Index at the individual level. For output of journal articles

at both the departmental level and the individual level and for the Quality

Oncken   33

of Journals Index at the individual level, the relationship between total

control and output was in the opposite direction of that predicted by

Hypothesis 1; the higher the total control in the department, the lower the

output. For "other" publications, the relationship was in the predicted

direction.

Both quantity and quality of journal publications were, therefore,

highest for departments with low total control. This negative relationship

between total control and research output in university departments

contrasts with a positive relationship between total control and output

found in other organizations. This difference may be due to the nature of

the research task. Research is conducted individually or in small groups,

and there is relatively little interdependence among departmental faculty

members with respect to research. It could be argued, therefore, that

participation in departmental administration and decision-making requires

of the faculty member a commitment of time and energy which could otherwise

be devoted to research. Therefore, involvement in organizational control

would detract from research output. By contrast, in organizations of the

type studied by Tannenbaum, the final product or output is at the organiza-

tional level, requiring interaction and interdependence among individual

members of the organization. In these organizations, individual involvement

in organizational control enhances output.

2. Main effects of distribution of control.

Hypothesis 1 predicted a positive relationship between the degree of

positive slope of the control graph and departmental output; that is,

departments with an egalitarian distribution of control were predicted to

have higher output than departments with an hierarchical distribution of

control. Statistically significant main effects of distribution of control

occurred only at the individual level. For output of technical reports,

the results supported Hypothesis 1; individuals in egalitarian departments

produced more technical reports than did individuals in hierarchical

departments. The results for output of book reviews, on the other hand,

contradicted Hypothesis 1. The relationship between slope of the control

graph and individual output of book reviews was negative.

Hypothesis 1, then, was generally not supported in the present study.

This was not too surprising considering the comparative study of Smith

and Tannenbaum (1963). In comparing the relationships between control

structure and effectiveness across a number of different organizations,

they found distribution of control to be related to effectiveness in only

one type of organization, a voluntary organization. Thus, it appears that

this main effect of distribution of control is not too general. The

results of the present study indicate, however, that distribution of

control may be an important mediator of the relationship between total

control and organizational output.

3. Interactions.

The tests of the interaction effects of total control and distribution

of control on departmental and individual output provided the most inter-

esting and important results of the present study. For a number of output

variables both at the departmental and individual level, a highly consistent

pattern of results emerged: There was a negative relationship between the

total amount of control in the department and departmental and individual

output in departments which had an hierarchical distribution of control

(i.e., departments in which tenured faculty members participated more in

departmental administration than did nontenured faculty members). When the
distribution of control between tenured and nontenured faculty members was
egalitarian, on the other hand, there was no relationship between total
control and output. Thus it appears that at least for university depart-
ments, the way in which control is distributed among members of the organ-
ization will determine the effect of the total amount of control in the
organization on effectiveness. This proposition clearly deserves empirical
tests n other types of organizations.

Finally, at the individual level, the size of the department was found
to enter into interactions with control structure in affecting output. For
individual output of monographs and book reviews, department size appears
to have mediated the interaction effect of distribution of control and
total control, with the interaction effect being more pronounced for small
departments than for large departments. For output of journal articles,
the negative relationship between total control and individual output was
stronger for large departments than for small departments. These results
support the prediction of Hypothesis 3 that department size would interact
with control structure in affecting output.

Relationships between Control Structure and Satisfaction

A very consistent finding that has appeared a number of times in the
literature on organizations is that the amount of control or influence
a person feels he has in an organization is positively related to his
satisfaction with his job or task (Smith & Tannenbaum, 1963; Tannenbuam,
1962; Vroom, 1960; Bachman & Tannenbaum, 1966). The results of the present
study showed no significant relationship between the control structure of
university departments and faculty satisfaction with various aspects of the

job situation. If these results are valid, they mark an important differ-

ence between universities and other types of organizations.

There is some reason to believe that the amount of influence or

control an individual has in a university department would not be related

to his job satisfaction. It is common lore that university faculty members

derive personal satisfaction from individual scholarly effort rather than

from accomplishments of the department as a whole. Thus, participating

in departmental affairs is less likely to be rewarding or satisfying to

a university faculty member than it would be for a factory worker.

Comparison to Previous Studies

To conclude from the results of this study that control structure-

output relationships are different for university departments than for

other types of organizations would be premature, because the present

study differs from the studies reported by Tannenbaum and his associates

in at least three important ways. First, there is the difference in setting.

To the knowledge of the author, this is the first study to investigate the

relationships between control structure and output variables in university

departments. As was pointed out in the first chapter, universities differ

from other organizations in many important ways, and these differences

require systematic treatment in order to identify critical differences.

Secondly, the measure of control used in this study differed from

that used by Tannenbaum and others. Their measure has typically consisted

of ratings by members of the organization of the amount of say or influence

that each of several hierarchical levels of the organization has over what

goes on in the organization. The measure of control used in the present

study required faculty members to rate their own degree of participation

in departmental administration and decision making. It is possible that

these two measures tap somewhat different processes of control.

An important limitation of the measure of control used in the present study was that it tapped only one source of control, namely participation in departmental administration. A more comprehensive measure of control or influence in a social system should take into account other sources of influence as well, such as legitimate or formal power, informal interpersonal relationships, assignment of individuals to a large number of positions, and the structure of the task system. O'Brien, Biglan and Penna (1961, in press), have developed a structural approach to the measurement of influence in an organization which takes into account all of these sources of influence. This type of approach to the measurement of control or influence should be encouraged, because it takes into account the complexities of the social system under study.

Finally, in the previous studies, the distribution of control was measured among different levels of relatively formal authority hierarchies. In the present study, the distribution of control between tenured and nontenured faculty was measured. Academic rank in a university department represents more of a status hierarchy than a formal authority hierarchy, so caution is required in comparing results of this study with results of previous studies.

In order to determine more adequately the similarities and differences in control processes between university departments and other types of organizations, more systematic research is needed in which the factors discussed above are varied one at a time.

Summary and Implications

Summary

A considerable amount of research, reviewed by Tannenbaum (1968), has

focused on the relationships between control processes and effectiveness
in a number of different types of organizations. These studies have dealt
with two aspects of the control structure of organizations: the total
amount of control in the organization and the distribution of control among
various hierarchical levels of the organization. Their results have shown
a fairly consistent positive relationship between the total amount of
control in the organization and organizational effectiveness and member
satisfaction. A less consistent finding has been that the distribution of
control in the organization is related to effectiveness, such that organizations
with a democratic or egalitarian distribution of control among hierarchical
levels are more effective than organizations in which the distribution of
control is hierarchical.

The present study extended this work into a novel setting, the
university. The control structures of 37 academic departments of the
University of Illinois were characterized in terms of two variables:
1) the total amount of control exercised by faculty members in the depart-
ment; and 2) the distribution of control in the department between tenured
and nontenured faculty members. Control was measured by self reports by
faculty members of their own degree of participation in departmental
administration and decision making.

Tests of the main hypotheses of the study revealed two very important
results. The first of these was a highly consistent pattern of interaction
effects of total control and distribution of control on departmental and
individual outputs. In departments in which control was distributed in an
hierarchical fashion (i.e., tenured faculty members had more control in the
department than nontenured faculty members), there was a negative relationship

between total control in the department and output. This negative relation-
ship is contrary to the positive relationship in other organizations
reported by Tannenbaum (1968). In departments in which the distribution of
control was egalitarian, there was no relationship between total control
and output. Thus, distribution of control appears to be important not in
its main effects, but rather in its mediation effect on the relationship
between total control and output.

The second important finding was that the control structure of
university departments was unrelated to faculty satisfaction with various
aspects of the job situation. This result contradicts a rather substantial
literature concerning the relationship between control and satisfaction in
organizations.

Practical Implications

The results of the present study have important practical implications
for the organization of university departments. It appears to be very
important for university administrators to consider the way in which control
in academic departments is distributed among faculty members. The results
of the present study indicate that the distribution of control has
important consequences for the relationship between the total amount of
faculty participation in departmental administration and subsequent output.
The results further indicate that at least research output is facilitated
by low faculty participation in departmental administration. Further
research is needed to assess the effects of control structure on teaching
outputs.

Two notes of caution must be sounded at this point. First, the
present study was conducted at a large, state-supported institution, which

places great emphasis on graduate education. Whether the results can be
generalized to other types of colleges or universities is a question for
further research.

Secondly, the output variables used in this study represented
"normative" or standard outps ts of university departments. If a department
is primarily concerned with other types   goals, such as innovation, or
religious education, or practical applications of knowledge to the social
problems of the day, then the results of the present study possibly do not
apply.

Implications for Theory

The theoretical implications of the present study are important not
only for theories about university organizations, but for organizational
theory in general. One very important finding of this study was the
interaction effect of total control and distribution of control on depart-
mental and individual output. Smith and Tannenbaum (1963) report that the
distribution of control had a main effect on organizational output in only
one organization of the several that were surveyed. The present results
indicate that the distribution of control is potent in its mediation
effect on the relationship between total control and organizational
effectiveness. The generality of this relationship across organizations
should clearly be assessed.

A further result of considerable theoretical importance is the lack
of relationship between departmental control structure and faculty
satisfaction. This may reflect less commitment to organizational matters
and more commitment to individual effort for university faculty members than
for members of other types of organizations. This may highlight at least one
of the critical differences between universities and other types of organizations.

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Footnotes

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2. Dividing by department size is not a linear transformation, so it was still possible for department size to correlate with the output measures used. Examination of the correlations between department size and each of the transformed outputs revealed that none of the correlations differed significantly from zero.