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ABSTRACT

Information to promote assessment of organizational effectiveness in colleges and universities is presented, along with an exercise to rank the effectiveness of 10 institutions. The exercise uses three types of criteria to indicate effectiveness: subjective ratings, data about students and activities, and institutional capacity and financial health. In ranking the colleges, the respondent is to generate three rank-order lists based on the perspectives of three different individuals: a high school senior who is choosing a college, a highly qualified Ph.D. who is selecting a college as an employer, and an official of a foundation who is looking for a college to fund. Information is provided on: questions to ask and ways to measure organizational effectiveness in higher education; factors affecting job attitudes; advantages of focusing on faults instead of on indicators of institutional effectiveness; a procedure for assessing ineffectiveness; fault tree analysis; the nominal group technique; computing a strategic path; nine dimensions of organizational effectiveness; a comparison of effectiveness for declining, stable, and growing schools; and a comparison of effectiveness of unionized and nonunionized institutions. (SW)

Assessing and Improving Institutional Effectiveness

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Analyzing Organizational Effectiveness in Ten Selected Institutions of Higher Education: A Case Study

Kim Cameron

Judging the effectiveness of colleges and universities is difficult for a variety of reasons. Some have to do with the nature of institutions of higher education. Others are characteristic of all judgments of organizational effectiveness. In this case, you are asked to make three independent judgments of effectiveness. That is, you are asked to rank order the effectiveness of ten institutions independently from three different perspectives. The data provided in this case relate to three types of criteria commonly used to indicate effectiveness: (1) subjective ratings, (2) data about students and activities, and (3) institutional capacity and financial health. These data are all available from public documents, so no violation of institution confidentiality has occurred by presenting them here.

Your task in analyzing this case is to put yourself in the position of each of the individuals introduced below and to select, in rank order, the five most effective institutions. Because there are three different individuals, you will need to generate three different rank-ordered lists. These three lists may be exactly the same or they may be different. In addition to the information presented in the case, you may use any other information available to you in making your judgment. But be prepared to justify your selections.

The three points of view you should adopt are as follows.

1. John Jones is a high school senior who wants to go to college. His objective is to select the most effective institution that he can find. He is a National Merit Scholar and an

outstanding football player, so eligibility for admission is no concern. He has limited his selection to the ten schools listed in the tables below.

2. Jane Jones is a new Ph.D. who wants to get a job in the best institution of higher education that she can find. She has an excellent track record coming out of her graduate program, and she is generally considered to be one of the best candidates on the market this year. She has narrowed her possibilities to the ten institutions in the tables below, and her main objective is to select the one that is most effective.

3. Jack Jones is an official from the MacArthur Foundation who has a bundle of money to spend. The only constraint is that it must be spent on a project that produces a valuable return on the investment and that gives the Foundation some visibility. Jack has decided to provide a large amount of money to one of the ten schools listed in the tables below, but he wants to select the most effective one to get the money.

I. Ratings

There are a large number of "guides to colleges" published annually in order to help individuals make choices about institutions of higher education. While the espoused purpose of these guides is not to assess organizational effectiveness, in practicality, they are frequently used as a basis for doing just that. Some of the guides even encourage readers to make such judgments (e.g., Barron's, "The Best, Most Popular, and Most Exciting Colleges," or McClintock's "100

Top Colleges: How to Choose and Get In"). One of the best known guides was published recently by the New York Times in which "academic quality," "social life," and "quality of life," was rated at 250 institutions in America. The ratings for the ten institutions on those three dimensions are reported in Table 1. The ratings range from 5 (top) to 1 (low).

Table 1 - New York Times Ratings (SOURCE: Edward B. Fiske, Selective Guide to Colleges, New York: Times Books, 1982)

School	Academics	Social	Quality of Life	Average
Brigham Young University	3	3	4	3.33
University of California Berkeley	5	3	3	3.67
Carnegie-Mellon University	4	3	3	3.33
University of Colorado Boulder	3	5	5	4.67
Duke University	4	4	4	4.00
Florida State University	3	3	3	3.00
Penn State University	3	5	3	3.67
University of Texas Austin	5	4	4	4.33
University of Wisconsin Madison	5	5	3	4.33
Yale University	5	3	4	4.00

The highest overall rating is given to the University of Colorado - Boulder followed by the University of Texas and the University of Wisconsin. Florida State is rated lowest, with Brigham Young and Carnegie-Mellon next lowest.

Another type of reputational rating can be produced by asking faculty members to rate the effectiveness (or quality, reputation, excellence, and so on) of various disciplines or departments at institutions of higher education. This essentially produces a set of peer evaluations of institutions and their programs. One such survey

was recently conducted by the Conference Board of Associated Research Councils, and it focused on various fields of study in graduate education. Table 2 reports 13 selected fields of study in the social, biological, and physical sciences, and in humanities and engineering. The ratings resulted from the perceptions of over 500 faculty members in each of the different areas. A score of 50 indicates the mean, and the standard deviation is 10. (See Table 2.)

TABLE 2 ABOUT HERE

Two different ratings are reported in the table. The first is a rating of "the scholarly competence and achievements of faculty members." The second is a rating of "the effectiveness of those departments in educating research scholars." Whereas wide variation exists in different fields of study within institutions, an average of the ratings of these selected fields of study may give some indication of overall institutional effectiveness. Considering only the overall average, the University of California is rated most highly followed by Wisconsin and Yale. The lowest rated school is Brigham Young followed by Florida State. (It should be noted that "how familiar [raters] were with each program being rated" was highly correlated with the ratings received. That is, programs that were more familiar to raters received higher ratings.)

II. Students and Activities

One might assume that a college or university is effective if it can attract the very best students to attend. It seems reasonable that the best (smartest) students attend institutions that they judge to be

Table 2 - Ratings of Selected Fields of Study in Graduate Education (SOURCE: Chronicle of Higher Education, 9/29/82, 11/10/82, 12/1/82, 1/12/83, 1/19/83).

CONFERENCE BOARD OF ASSOCIATE RESEARCH COUNCILS RATINGS
(Faculty Ratings MEAN = 50 SD = 10)

	Fac. quality[1] Effectiveness[2] ECONOMICS	Fac. quality Effectiveness SOCIOLOGY	Fac. quality Effectiveness PSYCHOLOGY	Fac. quality Effectiveness BOTANY	Fac. quality Effectiveness MICROBIOLOGY	Fac. quality Effectiveness CHEMICAL ENGINEERING	Fac. quality Effectiveness CIVIL ENGINEERING	Fac. quality Effectiveness ENGLISH	Fac. quality Effectiveness PHILOSOPHY	Fac. quality Effectiveness SPANISH	Fac. quality Effectiveness CHEMISTRY	Fac. quality Effectiveness MATHEMATICS	Fac. quality Effectiveness PHYSICS	OVERALL AVERAGES
Brigham Young	* *	43 47	40 *	43 47	40 36	47 46	* *	* *	* *	* *	45 45	* *	* *	44
California	65 65	69 65	69 65	65 65	55 56	71 70	75 74	71 70	69 65	67 68	74 72	72 71	72 70	68
Carnegie-Mellon	57 62	* *	65 65	* *	* *	60 61	57 56	* *	* *	* *	54 53	53 57	59 59	58
Colorado	44 46	44 46	64 63	42 46	* *	53 53	53 54	50 52	44 43	39 39	58 57	52 54	54 55	50
Duke	56 58	56 59	61 60	62 65	67 67	* *	50 49	57 57	46 43	56 56	54 55	52 49	53 54	56
Florida State	43 45	48 49	53 53	* *	* *	* *	* *	39 38	46 44	37 37	57 57	47 49	53 52	47
Penn State	47 47	47 51	61 61	42 41	43 43	53 53	46 50	53 55	47 48	51 53	60 60	53 55	48 52	51
Texas	49 48	60 60	63 61	68 67	56 57	61 60	37 36	59 60	55 56	69 68	63 61	40 39	62 55	57
Wisconsin	65 66	70 73	64 63	60 60	62 66	72 72	59 59	60 61	57 56	63 65	69 67	65 66	61 60	64
Yale	71 68	62 58	70 69	63 61	63 61	50 50	* *	73 71	57 55	68 65	64 64	69 67	65 65	64

* = Ratings not reported in the source.

[1] Faculty Quality = the perceived quality of the faculty in scholarly activity

[2] Effectiveness = the perceived effectiveness in educating students to be scientists & scholars

most effective in providing them with what they want. Furthermore, high quality students are expected to keep the academic effectiveness of the institution high just by their presence. Therefore, knowing where the best students go should help identify the best schools.

Table 3 reports the number of National Merit Scholars attending each of the 10 selected schools, as well as the national rank of those schools (i.e., their rank relative to all schools in the country) and their rank relatively to the other nine schools in the case. Note that Yale is ranked highest, followed by Texas and Duke. Wisconsin is ranked lowest followed by Carnegie-Mellon and Colorado.

Table 3 - Institutional Attendance of National Merit Scholars (1982) (SOURCE: Chronicle of Higher Education, 2/2/83)

School	Number	National Rank	Case Rank
Brigham Young University	27	48	7
University of California	42	31	5
Carnegie-Mellon University	21	58	9
University of Colorado	22	54	8
Duke University	64	17	3
Florida State University	46	27	4
Penn State University	29	45	6
University of Texas	130	8	2
University of Wisconsin	20	60	10
Yale University	171	5	1

Another potential indicator of institutional effectiveness is the extent to which students have access to faculty members at the institution. When classes are large, or they are taught by graduate students rather than by professors, the educational progress of students is generally assumed to suffer when compared to institutions where class size is small, and where students have a chance to interact with the faculty. One rather crude measure of student-faculty

interaction is the ratio of students per faculty member. Whereas there may be high variety in the degree to which faculty members are available to students in different institutions, and in the teaching load of faculty members which brings them into contact with students, student-faculty ratios have nevertheless been used as an indicator of effectiveness in published documents. Table 4 reports these ratios for the 10 schools. Note that Yale has the most favorable student-faculty ratio, followed by Duke and Carnegie-Mellon. The University of Texas has the least favorable student-faculty ratio, followed by Penn State and Brigham Young.

Table 4 - Student-Faculty Ratios - 1980 (SOURCE: College Facts Chart, 1980-81, National Beta Club)

School	Student-Faculty Ratio
Brigham Young University	19:1
University of California	14:1
Carnegie-Mellon University	13:1
University of Colorado	18:1
Duke University	9:1
Florida State University	15:1
Penn State University	21:1
University of Texas	23:1
University of Wisconsin	18:1
Yale University	6:1

Whereas some criteria for judging effectiveness are seldom acknowledged in the published literature, they nevertheless are held as important indicators for some individuals. One example is the success schools pursue in intercollegiate athletics. That is, major resources and energy are directed toward producing winning teams and gaining national exposure. One president of a perennial football power in the Midwest recently commented, for example, "Our goal is to have a

university our football team can be proud of." Winning football and basketball teams produce not only regional and national exposure for the institution, but they also may contribute to the institution's ability to acquire resources for other programs or activities as well. Table 5 reports the 1982 season football records, the number of televised football games in which the institution has been involved, and the number of professional football players representing each of the ten institutions.

Table 5 - Visibility and Success of Football Program (SOURCES: Chronicle of Higher Education, 5/4/81, 9/22/82; NCAA)

School	Season Record-1982	Number of Times on TV	Number of Pro Football Players-1980
Brigham Young University	8-3a	20	5
University of California	7-4b	28	16
Carnegie-Mellon University	6-3b	0	0
University of Colorado	2-8-1b	20	24
Duke University	6-5b	19	5
Florida State University	8-3c	18	5
Penn State University	10-1d	42	29
University of Texas	9-2e	57	17
University of Wisconsin	6-5f	24	8
Yale University	4-6b	20	1

a lost Holiday Bowl
b did not participate in a post-season bowl
c won Gator Bowl
d won Sugar Bowl
e lost Sun Bowl
f won Independence Bowl

By these three measures of effectiveness, Penn State and Texas appear to have the most success and potentially the most visibility for their institutions as a result of their football programs. Yale and Carnegie-Mellon appear to be the least successful on these criteria.

III. Capacity and Finances

Among the criteria of institutional effectiveness that appear frequently in published assessments are indicators of institutional capacity and financial health. For example, access to scholarly material is often equated with size and currency of library holdings. Table 6 reports the size of the libraries of the ten schools along with a national ranking given them by the Association of Research Libraries based on expenditures, currency, holdings, etc. On the basis of this criterion of institutional capacity, California and Yale are clearly at the top while Carnegie-Mellon and Florida State are at the bottom of these ten schools. This criterion may indicate the effectiveness of an institution in providing scholarly support for its students and faculty.

Table 6 - Rankings of University Libraries (SOURCE: Chronicle of Higher Education, 1/27/82)

School	Number of Volumes	National Ranking
Brigham Young University	1,574,000	58
University of California	6,117,000	2
Carnegie-Mellon University	*	*
University of Colorado	1,928,000	68
Duke University	3,084,000	30
Florida State University	1,414,000	71
Penn State University	2,273,000	21
University of Texas	4,847,000	7
University of Wisconsin	4,184,000	12
Yale University	7,725,000	4

* not in top 100 libraries

Indicators of institutional financial health also are used frequently in assessments of institutional effectiveness or well-being. In fact, quite a large literature has emerged on that topic over the

last several years. Whereas there has yet to be produced a set of agreed upon indicators of financial health, there are some indicators that most people accept as reasonable criteria of financial effectiveness in colleges and universities. Table 7 contains a listing of five such indicators which are defined as follows:

Financial Independence - the proportion of revenues received from six different sources

Financial Flexibility - the proportion of unrestricted revenues

Financial Cushion - the proportion of current revenues left unspent

Revenue Drawing Power - the ability of the institution to attract revenues

Endowment Yield - the amount of endowment income relative to other similar schools

These indicators relate, austensibly, to the ability of the institution to survive over time and to garner enough financial resources to meet its needs. The ability to use resources in areas where they are most needed is also included in these criteria.

TABLE 7 ABOUT HERE

In terms of financial health, Yale University appears to be the most effective institution (although it is relatively weak in financial independence) followed by Texas (which is relatively weak in revenue drawing power) and Carnegie-Mellon (which is also relatively weak in financial independence). The least healthy or least effective institutions on these criteria are Florida State University followed by Brigham Young and Colorado.

Table 7 - Selected Measures of Financial Health (SOURCE: HEGIS file at NCHEMS, 1980-81)

School	Financial Independence		Financial Flexibility		Financial Cushion		Revenue Drawing Power		Endowment Yield		Combined Rank
	#	Rank	#	Rank	#	Rank	#	Rank	#	Rank	
Brigham Young	.75	(10)	.25	(1)	-.20	(10)	465	(9)	-.73	(8)	9
California	1.32	(5)	.04	(7)	.24	(5)	585	(4)	-.16	(4)	4
Carnegie Mellon	1.17	(8)	.13	(3)	.44	(3)	614	(3)	-.04	(3)	3
Colorado	1.50	(2)	.04	(7)	.11	(8)	459	(10)	-.81	(9)	8
Duke	.96	(9)	.06	(5)	.31	(4)	663	(2)	-.24	(6)	5
Florida State	1.20	(6)	.01	(10)	.10	(9)	495	(6)	-.83	(10)	10
Penn State	1.53	(1)	.04	(7)	.12	(7)	486	(8)	-.18	(5)	6
Texas	1.49	(3)	.10	(4)	1.54	(1)	492	(7)	1.53	(2)	2
Wisconsin	1.47	(4)	.05	(6)	.17	(6)	520	(5)	-.61	(7)	6
Yale	1.18	(7)	.14	(2)	.87	(2)	675	(1)	2.07	(1)	1

* Except for the ranks, the higher the number the better.

A final criterion of institutional effectiveness included in this case relates to the ability of the institutions to acquire research revenues. Since each of these ten schools claim as part of their domain the generation of new knowledge through research and scholarship, the presence of research grants provides at least one measure of success in this endeavor. Table 8 reports the amount of federal, state, and local research grants obtained for each of the institutions during 1980-81.

Table 8 - Research Grants (SOURCE: HEGIS file at NCHEMS, 1980-81)

School	Research Grant Total (in millions)
Brigham Young University	0.0
University of California	90.1
Carnegie-Mellon University	26.7
University of Colorado	31.5
Duke University	46.3
Florida State University	21.2
Penn State University	39.1
University of Texas	67.4
University of Wisconsin	115.3
Yale University	96.1

Using this criterion of effectiveness, the University of Wisconsin rates highest followed by Yale and California. Brigham Young, which accepts no federal, state, or local funds, is last followed by Florida State and Carnegie-Mellon.

Conclusion

The criteria of institutional effectiveness included in this case are just a sampling of the many possible indicators that could be used. In making your judgments about the most effective institutions from the three perspectives, you may want to consider other criteria in addition

to those listed here. Just be sure you can give a rationale for your selections.

In thinking about relative effectiveness, you may also want to consider questions such as these. Which institutions are likely to survive the 1980s in the best shape? Which institutions are most likely to do the most <u>good</u> (in addition to doing <u>well</u>)? Which institutions fulfill a unique need in American higher education?

TABLE 9 A Summary of Rankings on the Eight Criteria of Effectiveness

	New York Times Ratings	Combined Graduate Program Ratings	Attendance of National Merit Scholars	Student-Faculty Ratio	Football Program Success	Library Rankings	Financial Health Indicators	Federal Research Grants
Brigham Young University	8	10	7	8	4	7	9	10
University of California-Berkeley	6	1	5	4	3	1	4	3
Carnegie-Mellon University	8	4	9	3	10	10	3	8
University of Colorado-Boulder	1	8	8	7	6	8	8	7
Duke University	4	6	3	2	8	6	5	5
Florida State University	10	9	4	5	7	9	10	9
Penn State University	6	7	6	9	1	5	6	6
University of Texas-Austin	2	5	2	10	2	3	2	4
University of Wisconsin-Madison	2	2	10	6	5	4	6	1
Yale University	4	2	1	1	9	2	1	2

SEMINAR OBJECTIVES

1. Help participants become aware of the problems involved in assessing organizational effectiveness in colleges and universities.

2. Help participants understand alternative approaches to assessing and improving organizational effectiveness.

3. Help participants eliminate organizational faults and weaknesses that inhibit the effectiveness of their institutions.

4. Help participants identify strategies that will enhance the effectiveness of their institutions.

5. Creat an action plan for instituting changes.

Unquestionably, universities are among the worst managed institutions in the country. Hospitals and some state and city administrations may be as bad; but no business or industry except Penn Central [which subsequently went bankrupt] could possibly be. One reason, incredibly enough, is that universities--which have studied everything from government to Persian mirrors and the number seven--have never deeply studied their own administration.

Warren Bennis, 1973

This evaluation will be a waste of time, for either it will demonstrate that the program is excellent or that it is defective in some sense. In the first case it is a waste of time because we already know that it's a good program, and in the second, it's a waste of time because we would not believe any evidence of weakness.

from a study conducted by
Paul Dressel, 1971.

OBJECTIVES OF WORCESTER STATE

"Worcester State's objectives are to graduate students at the undergraduate and graduate level, who are responsible members of modern society; knowledgeable of our western heritage and appreciative of other cultures; conversant with science, concerned with social problems, and respectful of human values; skillful in the process of analysis, able to judge between competing claims and creative in their thinking; alert and fluent in defense of fundamental rights and courageous in their beliefs."

SOURCE: WORCESTER STATE CATALOGUE

WHY ARE JUDGEMENTS OF ORGANIZATIONAL EFFECTIVENESS IN HIGHER EDUCATION SO PROBLEMATIC?

1. Measurable criteria of effectiveness are difficult to identify in colleges and universities.

2. Colleges and universities frequently consider themselves to be unique and incomparable to other institutions.

3. Models of organizational effectiveness that were developed in other types of organizations may have limited applicability to higher education.

4. Most investigations of organizational performance rely on oversimplified proxy measures of effectiveness that apply to a limited number of schools.

The only way you can criticize a university, the only way you can appraise it, the only way you can determine whether it's good or bad or medium or indifferent, is to know what it's about, what it's supposed to be, what it's supposed to be doing. If you don't know these things, you haven't any standards of criticism . . . (Universities) haven't any very clear ideas of what they're doing or why. They don't even know what they are.

Robert Maynard Hutchins, 1975.

Some people have tried to compare our institution with some elite schools, calling us "the Harvard of the West." We don't seek to be the Harvard of the West. Why we don't even seek to be the Yale of the West!

Jeffrey Holland, 1982

MODEL	DEFINITION	WHEN USEFUL
	An Organization is effective to the extent that....	
Goal Model	It accomplishes its stated goals.	Goals are clear, consensual, measurable
System Resource Model	It acquires needed resources.	Clear connection between inputs and outputs
Internal Process Model	It has an absence of internal strain, smooth internal functioning.	Clear connection between processes and primary task
Strategic Constituencies Model	All strategic constituencies are at least minimally satisfied.	Constituencies have powerful influence; the organization reacts

COMMONLY USED PROXY MEASURES FOR ORGANIZATIONAL EFFECTIVENESS IN HIGHER EDUCATION

1. Reputational ratings ("Rate the 5 schools that you think are the best in this field.")

2. Faculty honors and publication counts (Guggenheim fellowships, federal government appointments, etc.)

3. Citation counts (Relying mainly on citation indexes)

4. Starting salaries of graduates

5. Entrance exam scores of beginning students (SAT, ACT, etc.)

6. Size of the library and the physical plant (The number of books per student, the amount of scientific laboratory equipment, etc.)

CRITICAL GUIDELINES IN ASSESSING ORGANIZATIONAL EFFECTIVENESS

QUESTION	
1. What is the <u>purpose</u> of the assessment?	A purpose of identifying organization strengths may produce different data than a purpose of finding places to cut the budget.
2. What <u>domain of activity</u> is being considered?	Criteria differ when internal activities are assessed versus external activities.
3. Which <u>constituency's perspective</u> is being considered?	Major funders may value different criteria than administrators.
4. What <u>level of analysis</u> is being used?	The effectiveness of the faculty is not the same as the effectiveness of the institution.
5. What <u>time frame</u> is being employed?	Short-term versus long-term criteria may be contradictory.
6. What <u>type of data</u> are to be gathered?	The perceptions of organization members may differ from certain factual or statistical information.
7. What <u>referent</u> is used to make judgements?	There are at least five referents against which to judge effectiveness: comparative normative goal centered improvement traits

Organizational Efficiency

1. Concerned with internal organizational processes.

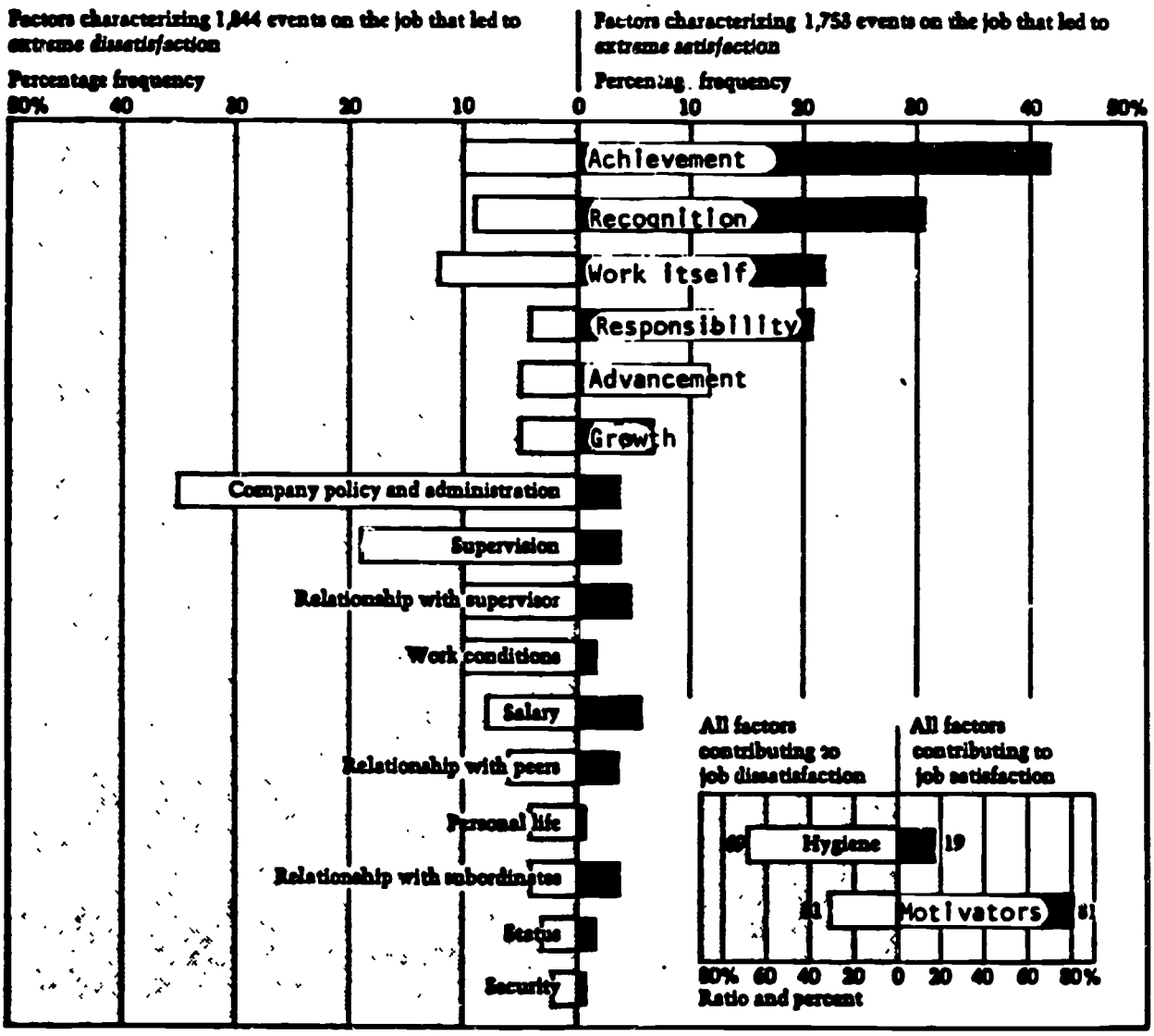
2. Concerned with reducing waste (or organizational "fat").

3. It means doing the same thing with fewer resources.

4. It is generally relatively easily measurable, and it is indicated by ratios such as cost per student, cost per instructional unit, cost per square foot of space, etc.

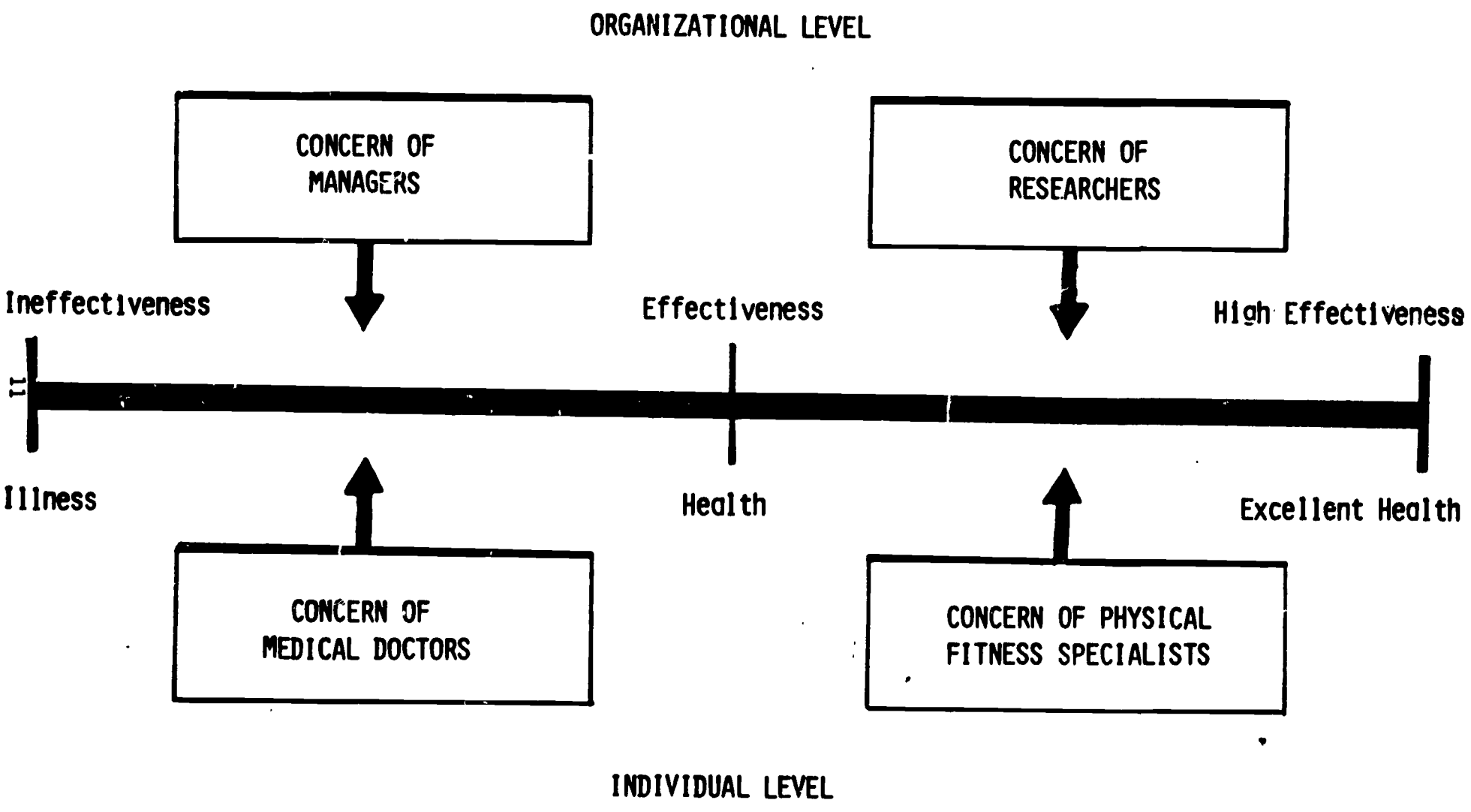
5. It is largely concerned with resource *allocation* as opposed to resource *generation*, with the use of resources rather than the acquisition of resources.

FACTORS AFFECTING JOB ATTITUDES, AS REPORTED IN 12 INVESTIGATIONS



Source: Frederick Herzberg, "One more time: How do you motivate employees?", Harvard Business Review, Jan./Feb., 1968.

A COMPARISON OF CONTINUA OF INDIVIDUAL HEALTH AND ORGANIZATIONAL EFFECTIVENESS



There is no Invisible Hand to guarantee that choices made without much regard to health and safety will magically avoid damaging health and safety, especially when the harmful by-products of every individual firm are mixed together... in unconsidered and unintentional and sometimes unknown and unpresedented interacting combinations. It would not be surprising if, in order to avoid harm, enterprises needed to aim firmly at avoiding harm.

Henry Shue, 1981

SOME ADVANTAGES OF FOCUSING ON FAULTS INSTEAD OF ON INDICATORS OF INSTITUTIONAL EFFECTIVENESS

1. It is easier to identify faults and weaknesses than strengths and positive characteristics.

2. There is more motivation to change with negative feedback.

3. There is more consensus possible regarding faults than strengths.

4. Identifying faults can identify specific places where change can occur.

5. Ineffectiveness is more easily assessed than is effectiveness.

THE DEFINITION OF ORGANIZATIONAL EFFECTIVENESS USING THIS APPROACH IS:

"An organization has achieved basic effectiveness to the extent to which it is free from characteristics of ineffectiveness."

FAULT TREE ANALYSIS

- ... was developed in the field of safety engineering to evaluate the effectiveness of the Minuteman Missile System (i.e., faults had to be identified and overcome in advance of happening)

- ... has not been applied to behavioral systems

- ... relies on deductive processes (i.e., identify faults that inhibit effectiveness then determine their causes or manifestations)

SUMMARY OF THE PROCEDURE FOR ASSESSING INEFFECTIVENESS

A. Identify a group of experts who can validly assess the faults of the institution.

B. Have them determine the top fault by specifying the major (priority) indicator of ineffectiveness in the organization.

C. Have them identify the primary faults or problems that contribute to the occurrence of that top fault using consensus building methods.

D. Continue the analysis on more specific levels of the tree until a level of specificity is reached that identifies a specific change strategy.

E. Determine weights for the faults in the tree through the experts' subjective judgments of importance and frequency.

F. Compute primary and secondary strategic paths through the logic gates.

G. Identify prioritized change and redesign strategies for improving organizational effectiveness based on the strategic paths.

NOMINAL GROUP TECHNIQUE

1. A specific question is identified.

2. Each group member independently writes down all the alternatives they can think of.

3. Each group member shares one alternative at a time, in turn, until all ideas have been shared and recorded.

4. No evaluation of alternatives occurs up to here.

5. After all ideas have been presented, a discussion of pros and cons of each alternative is conducted.

6. Group members then independently rank order the alternatives from most acceptable to least acceptable.

7. Those rankings are shared, and the list of alternatives is narrowed to the top few.

8. Another discussion of pros and cons is held, and the process is iterated until an acceptable alternative is identified.

ILLUSTRATION OF THE AND LOGIC GATE

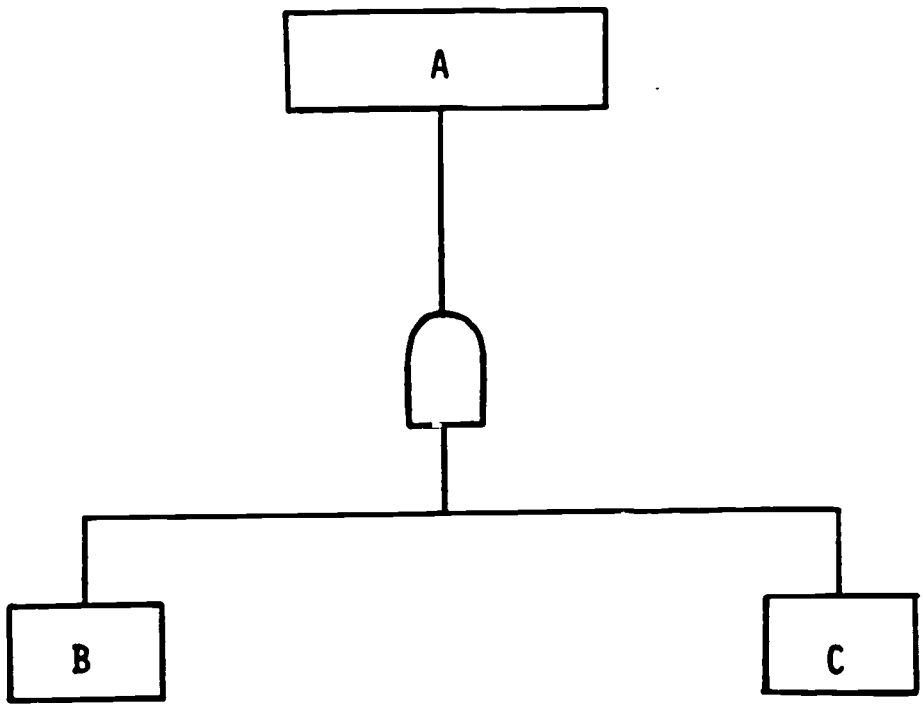
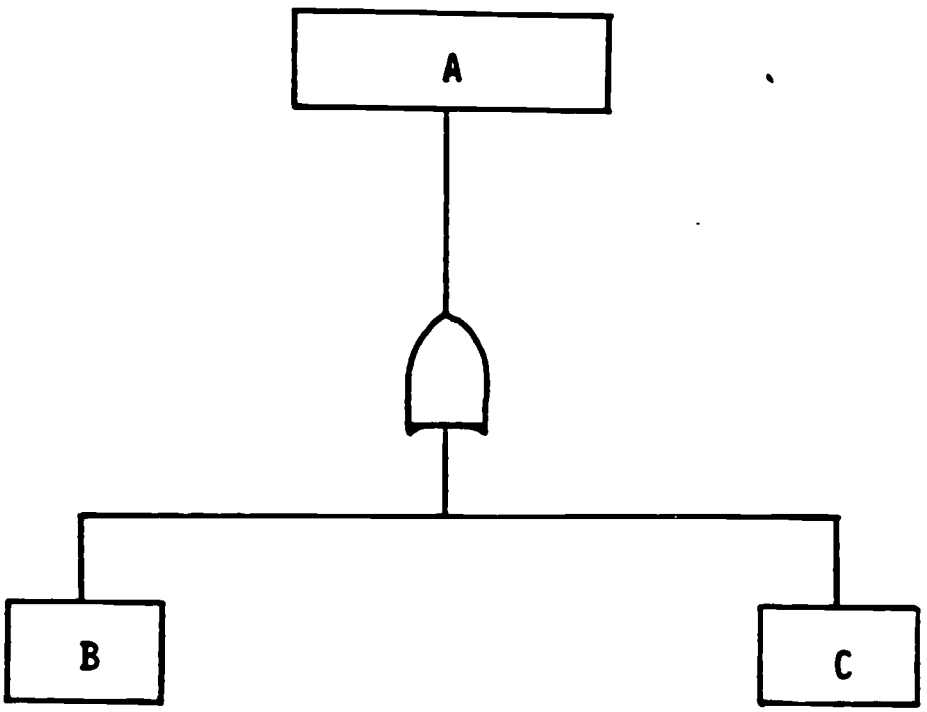
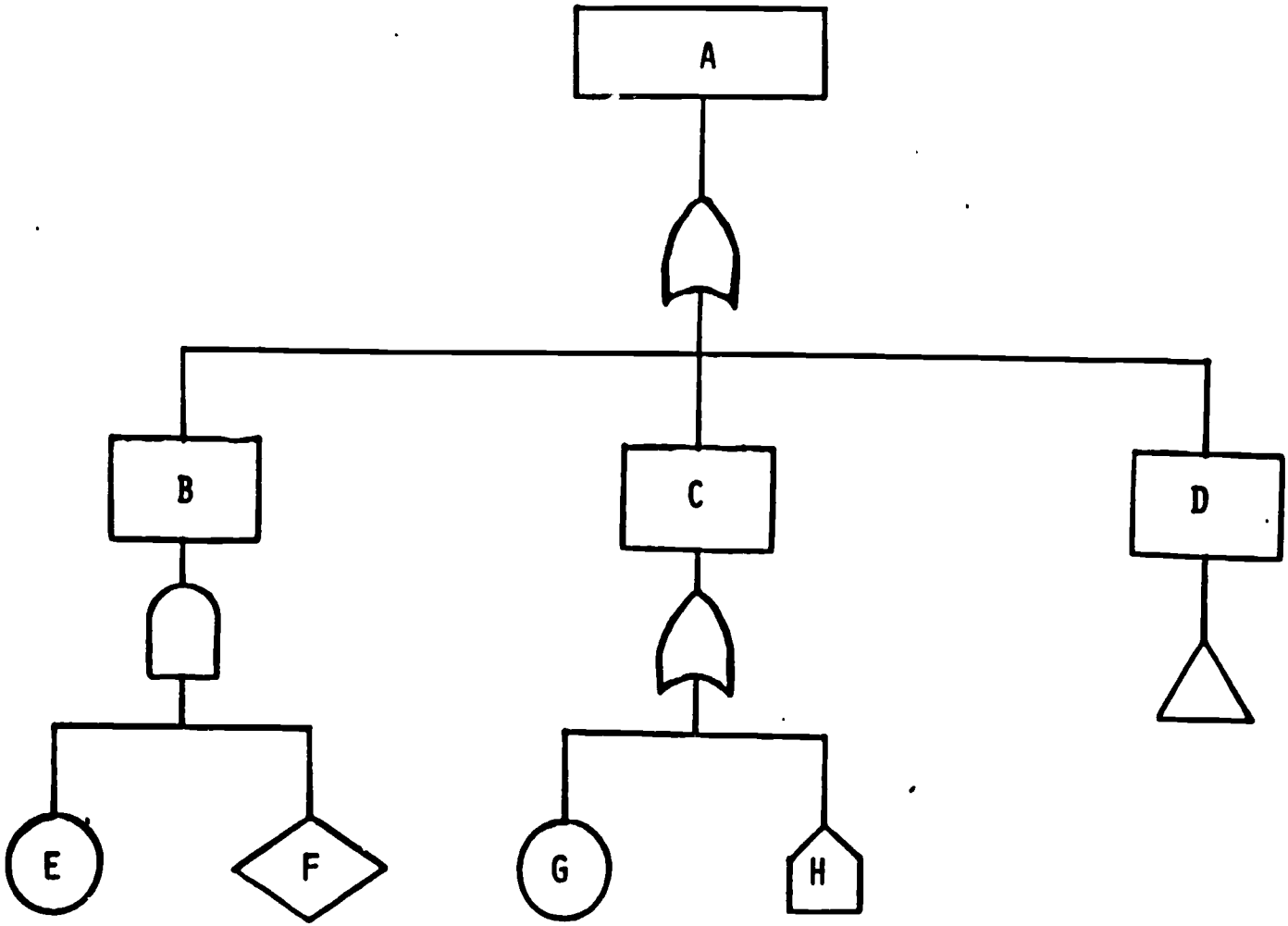


ILLUSTRATION OF THE OR LOGIC GATE



An Elementary Fault Tree Diagram



FAULT TREE ANALYSIS VALIDITY CHECK

1. IS THIS AN INDICATOR OF INEFFECTIVENESS IN THE INSTITUTION? IS IT A PROBLEM THAT STANDS IN THE WAY OF SUCCESSFUL PERFORMANCE?

2. ARE ALL THE MAJOR CONTRIBUTING FACTORS LISTED BELOW THE TOP FAULT IN THE TREE?

3. DO THE CONNECTING LOGIC GATES ACCURATELY CHARACTERIZE THE RELATIONSHIPS BETWEEN PRIMARY FAULTS AND THE TOP FAULT?

COMPUTING A STRATEGIC PATH

1. Rate the importance or relative contribution of the fault to the occurrence or presence of the fault on the next higher level.

2. Importance or contribution ratings must total 1.0 for each level on each branch of the tree.

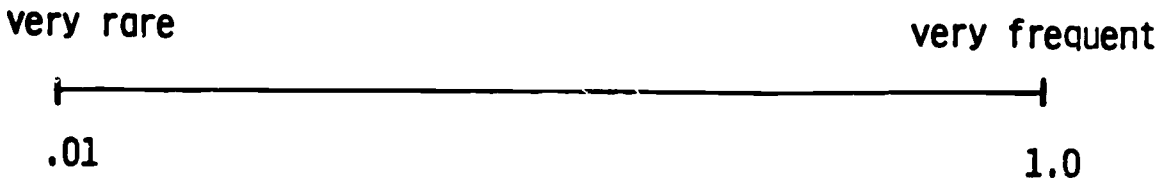
3. Rate the frequency of occurrence, or urgency, of the bottom faults.

4. These ratings need not total to 1.0 for each level of each branch of the fault tree.

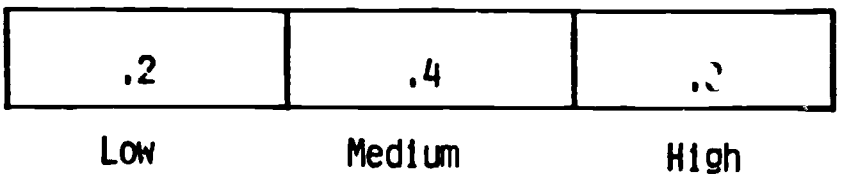
5. Use the formulas for each type of logic gate to determine weights for each primary fault.

6. Draw the strategic path.

Illustration of Two Frequency Scales



Points



Frequency

Algebraic Formulas for Computing Strategic Path Values for Three Types of Logic Gates

Formula Number	Type of Gate	Formula
1	Exclusive OR	SPW* = P**(Fault$_1$) + P(Fault$_2$) + . . . P(Fault$_N$) • (importance weight of the more general fault)
2	Inclusive OR	SPW = P(Fault$_1$ U Fault$_2$ U . . . Fault$_N$) • (importance weight of the more general fault) or SPW (for a gate with 3 faults) = {P(Fault$_1$) + P(Fault$_2$) + P(Fault$_3$) - P(Fault$_1$ ∩ Fault$_2$) - P(Fault$_1$ ∩ Fault$_3$) - P(Fault$_2$ ∩ Fault$_3$) + P(Fault$_1$ ∩ Fault$_2$ ∩ Fault$_3$)} • (importance weight of the more general fault) where P(Fault$_1$ ∩ Fault$_2$ ∩ Fault$_3$)=P(Fault$_1$) • P(Fault$_2$) • P(Fault$_3$)
3	AND	SPW = P(Fault$_1$ ∩ Fault$_2$ ∩ . . . Fault$_N$) • (importance weight of the more general fault) or SPW = {P(Fault$_1$) • P(Fault$_2$) • . . . P(Fault$_N$)} • (importance weight of the more general fault)

* SPW = Strategic Path Weight

** P = Probability of fault in non-behavioral systems; weight calculates for the fault in behavioral systems.

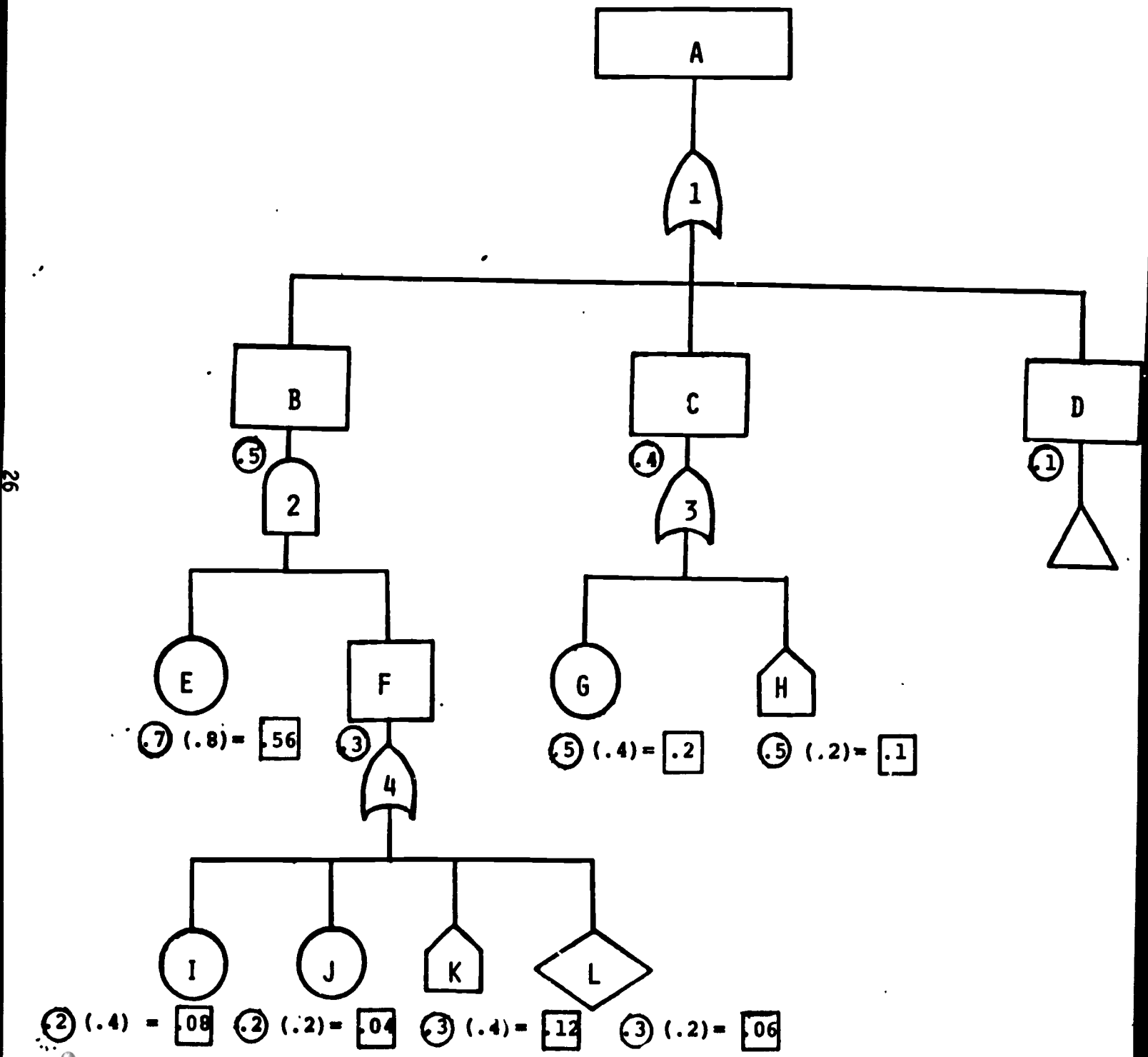
THE PURPOSE OF THE STRATEGIC PATH

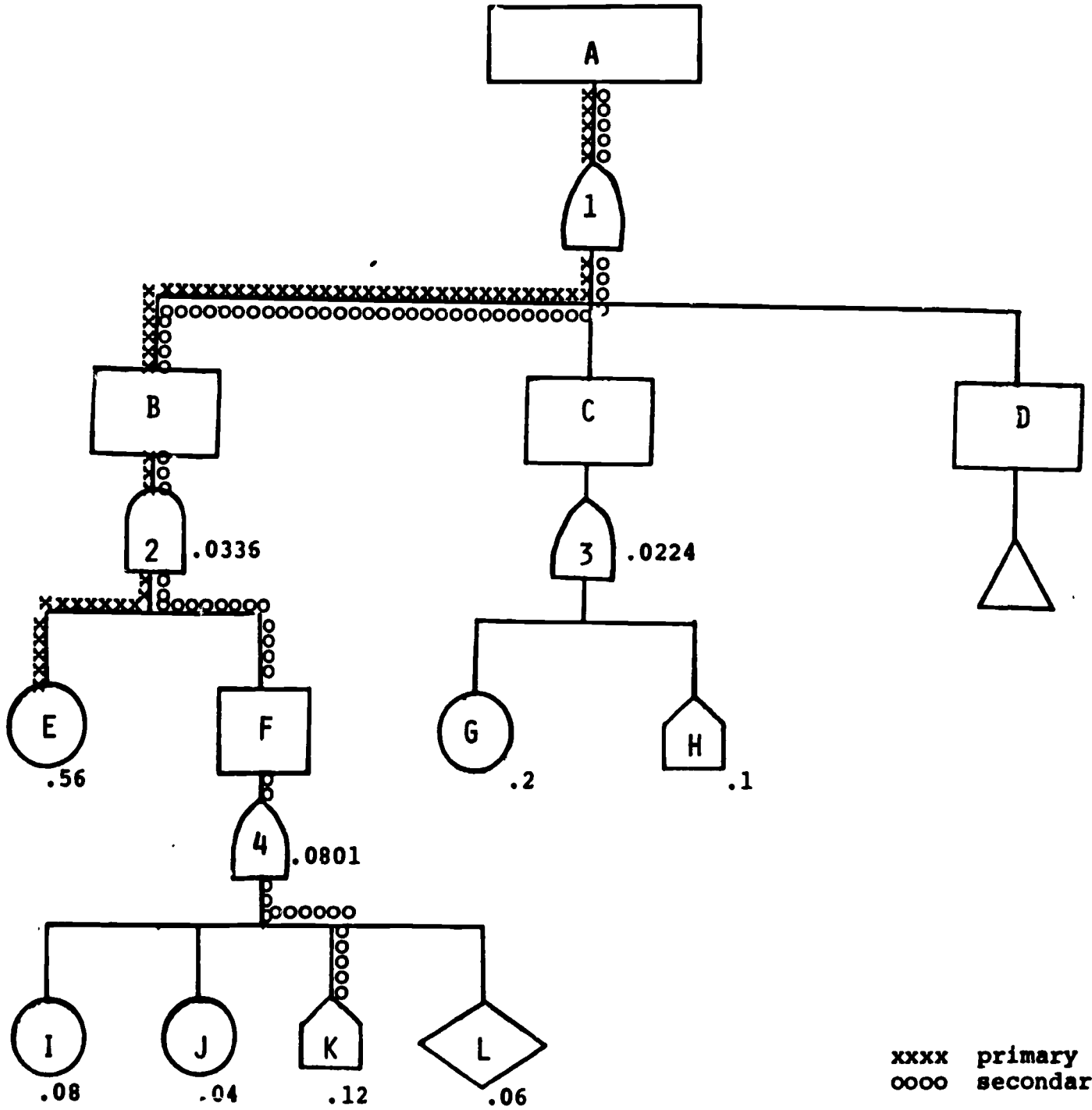
1. A STRATEGIC PATH IDENTIFIES PLACES TO START TO OVERCOME FAULTS AND TO IMPROVE ORGANIZATIONAL EFFECTIVENESS.

2. A STRATEGIC PATH SHOWS THE TIGHT CONNECTIONS WITHIN THE ORGANIZATION WHERE THE MOST IMPROVEMENT IS LIKELY TO OCCUR.

3. A STRATEGIC PATH SIMPLIFIES THE SEARCH FOR WHAT TO CHANGE AND HOW TO IMPROVE THE SYSTEM.

Illustration of a Weighted Fault Tree





xxxx primary strategic path
oooo secondary strategic path

FOUR GENERAL STEPS IN CONDUCTING FAULT TREE ANALYSIS

1. Identify a top fault.
2. Identify primary (contributing) faults.
3. Place the faults in tree form.
4. Determine a strategic path.

ADVANTAGES AND DISADVANTAGES OF FAULT TREE ANALYSIS

A. ADVANTAGES

(1) Easier to identify and agree on faults than strengths.

(2) Faults match managerial concerns.

(3) Broad participation is required which builds commitment.

(4) Understanding of the system is increased.

(5) Description is combined with prescription.

(6) Potentialities (could's) are able to be identified.

B. DISADVANTAGES

(1) Not enough information may be present in the system.

(2) Biased results may occur because of scapegoating, etc.

(3) A large amount of time is required of a lot of people.

(4) There is no guarantee that solving a problem on a lower level will lead to elimination of the top fault.

(5) This focuses on weaknesses, not strengths (e.g., policy literature).

(6) Some organizations function well because they are not understood.

A SAMPLE OF QUESTIONS ASKED TO IDENTIFY CRITERIA OF ORGANIZATIONAL EFFECTIVENESS

1. What organizational characteristics do effective colleges and universities possess?

2. What would need to change in this college or university to make it more effective?

3. Think of an institution of higher education that you judge to be effective. What characteristics make it effective?

4. Of the 130 or so characteristics of effective colleges and universities found in the literature, which ones are applicable to the effectiveness of this institution?

5. Of the characteristics of effectiveness mentioned, which ones cannot be measured (because of unavailability of data, etc.)?

THE RESULT:

A listing of the characteristics that would be possessed by the most effective institution of higher education.

ASSESSMENTS OF ORGANIZATIONAL EFFECTIVENESS IN INSTITUTIONS OF HIGHER EDUCATION

Answers to the seven guidelines

1.	Constituency:	Dominant coalition members
2.	Domain:	Undergraduate
3.	Level of analysis:	Organization
4.	Purpose:	Identify major dimensions of effectiveness and institutional profiles
5.	Time frame:	Short-term and static
6.	Type of data:	Perceptions & factual
7.	Referent:	Possession of traits, and comparisons to other similar institutions

NINE DIMENSIONS OF ORGANIZATIONAL EFFECTIVENESS

1. Student Educational Satisfaction

2. Student Academic Development

3. Student Career Development

4. Student Personal Development

5. Faculty and Administrator Employment Satisfaction

6. Professional Development and Quality of the Faculty

7. Systems Openness and Community Interaction

8. Ability to Acquire Resources

9. Organizational Health

SOME MAJOR FINDINGS REGARDING EFFECTIVENESS IN COLLEGES AND UNIVERSITIES

1. Patterns of Organizational Effectiveness

   A. Certain kinds of institutions hold distinctive profiles of organizational effectiveness.

   B. Institutions that are declining score lower on effectiveness dimensions related to academic quality and to morale than do institutions that are stable or growing.

   C. Institutional profiles of organizational effectiveness stay relatively constant over time.

2. Associations between Effectiveness and other Organizational Characteristics

   A. Institutions with a faculty union score lower on the dimensions of organizational effectiveness than do institutions without a faculty union.

   B. Certain indicators of institutional financial health are strongly associated with organizational effectiveness scores.

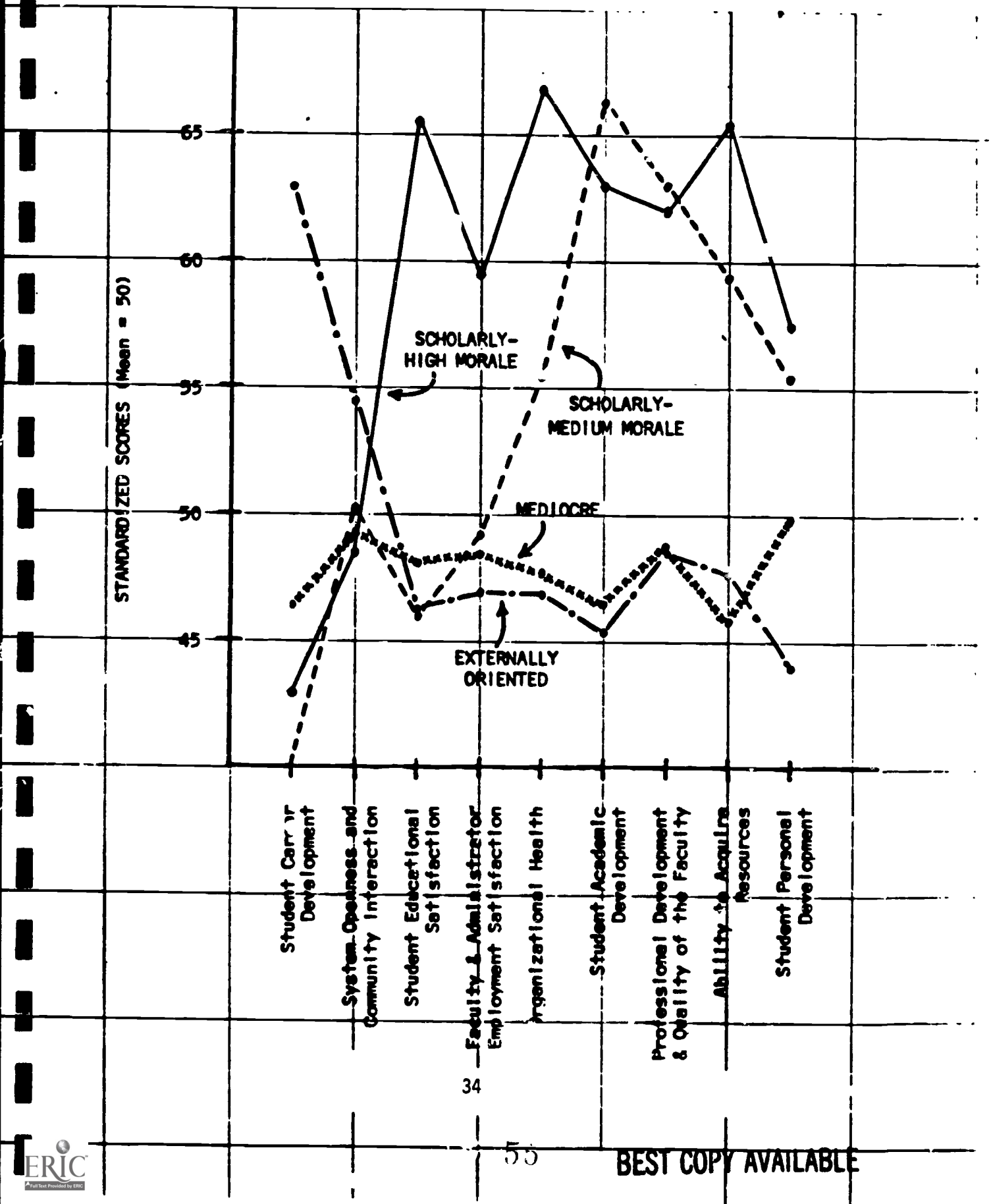
3. Predictors of Organizational Effectiveness

   A. Characteristics of the external environment, administrative strategy, and resource availability are important predictors of most dimensions of effectiveness.

   B. Adversarial relationships inside and outside the institution, as well as adequate financial resources predict improving organizational effectiveness over time.

   C. Proactive (as opposed to reactive) strategies and a cosmopolitan (as opposed to local) emphases distinguished institutions that improved in effectiveness from those that declined.

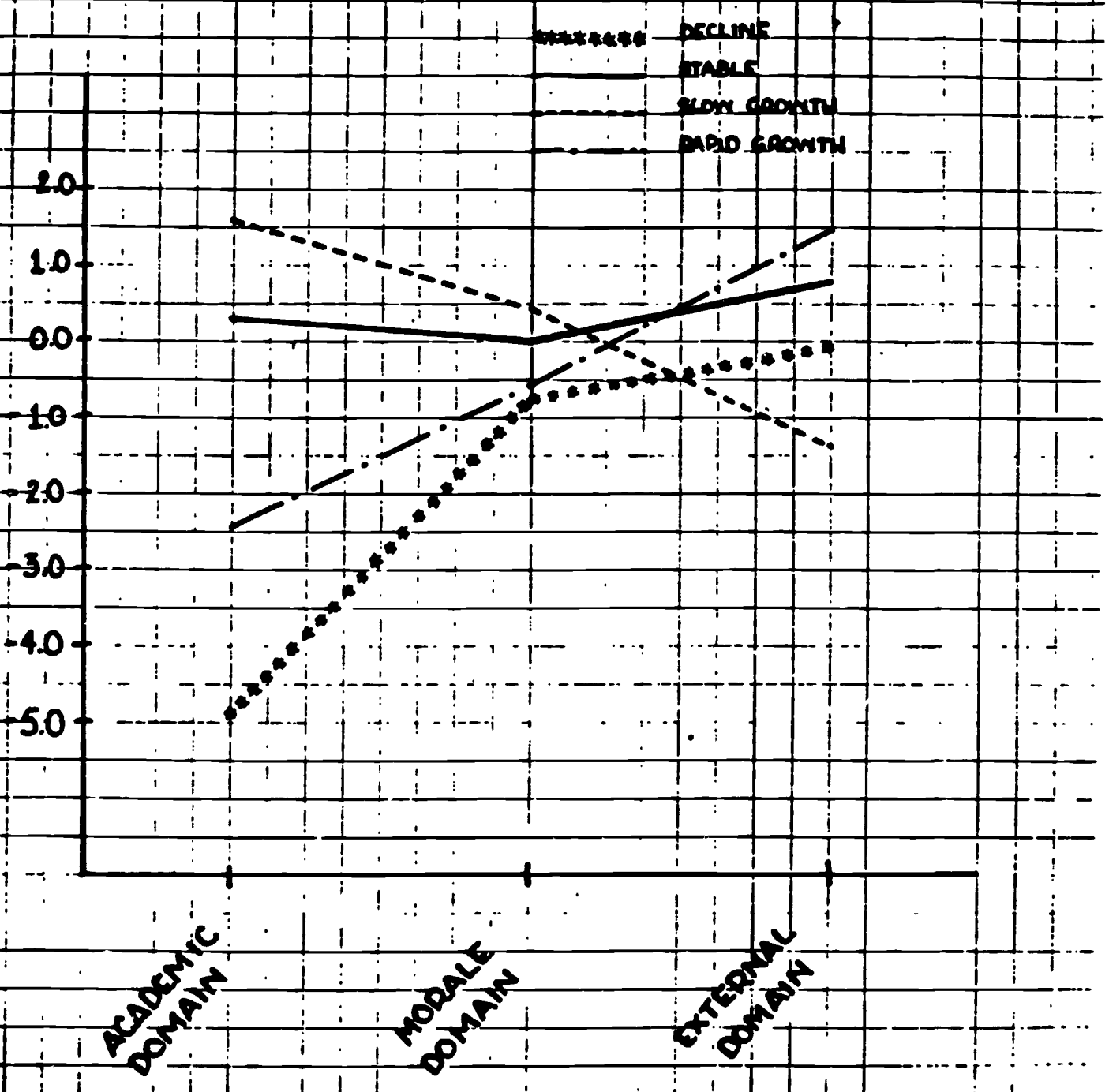
PROFILES OF EFFECTIVENESS FOR FOUR INSTITUTIONAL CLUSTERS



- SOME MAJOR DISTINGUISHING CHARACTERISTICS AMONG INSTITUTIONS HOLDING DIFFERENT PROFILES OF ORGANIZATIONAL EFFECTIVENESS

INSTITUTIONAL GROUP	SOME DISTINGUISHING CHARACTERISTICS
Scholarly, High Morale Group	Affluent institutions Academically oriented Liberal arts emphasis
Scholarly, Medium Morale Group	Affluent institutions Professionally oriented Emphasis on faculty development
Externally Oriented Group	Developing institutions Professionally oriented Emphasis on fund raising
Mediocre Group	Growing and developing institutions Teaching oriented Emphasis on fund raising

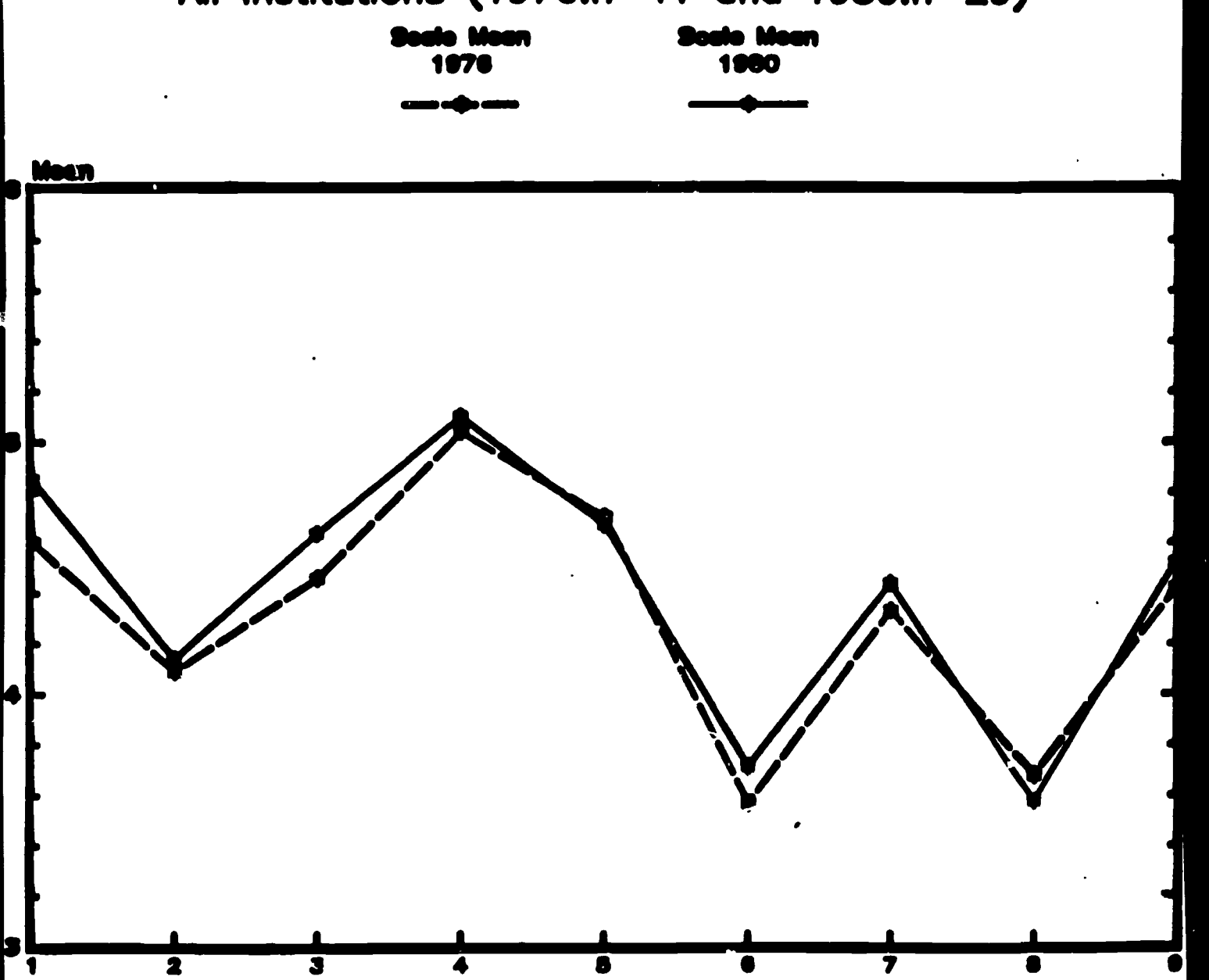
COMPARISONS OF EFFECTIVENESS FOR DECLINING, STABLE AND GROWING SCHOOLS



DIMENSIONS OF EFFECTIVENESS RELATED TO:

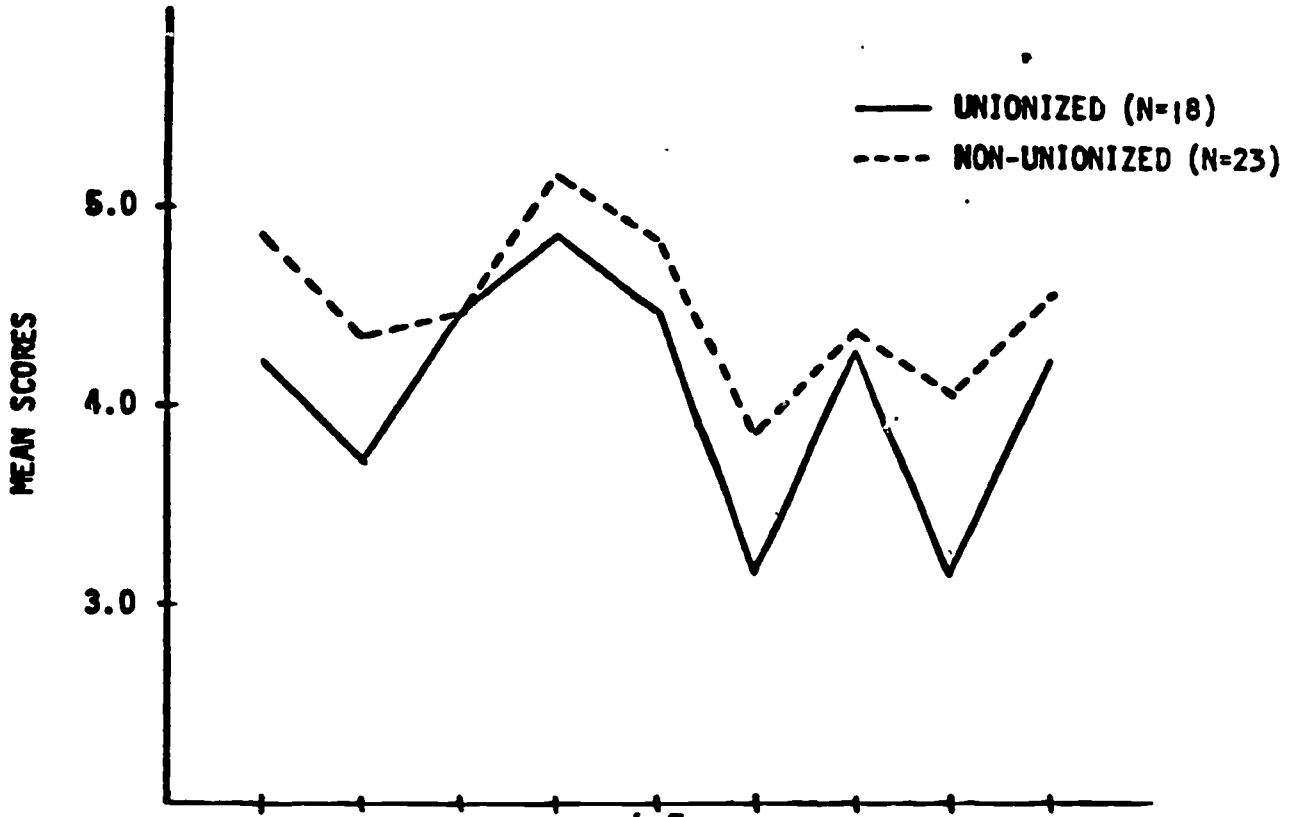
Comparison of Scale Means*

All Institutions (1976:n=41 and 1980:n=29)



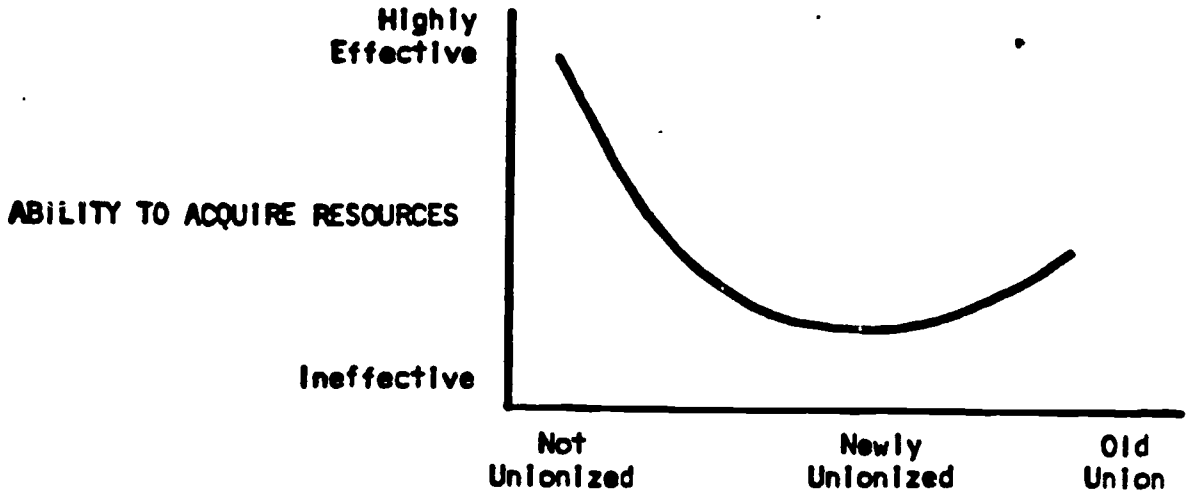
*Each scale measures one dimension of Organizational Effectiveness

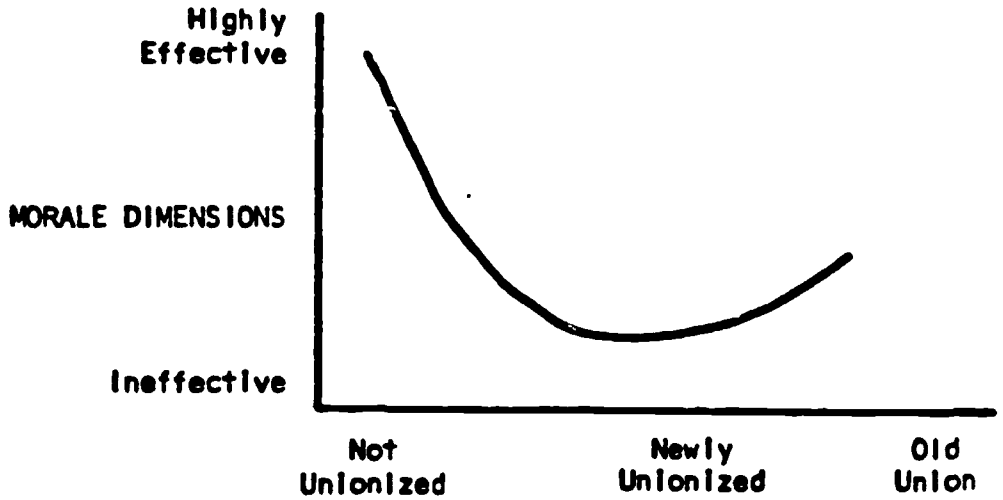
A COMPARISON OF EFFECTIVENESS DIMENSION MEAN SCORES FOR UNIONIZED INSTITUTIONS AND NON-UNIONIZED INSTITUTIONS

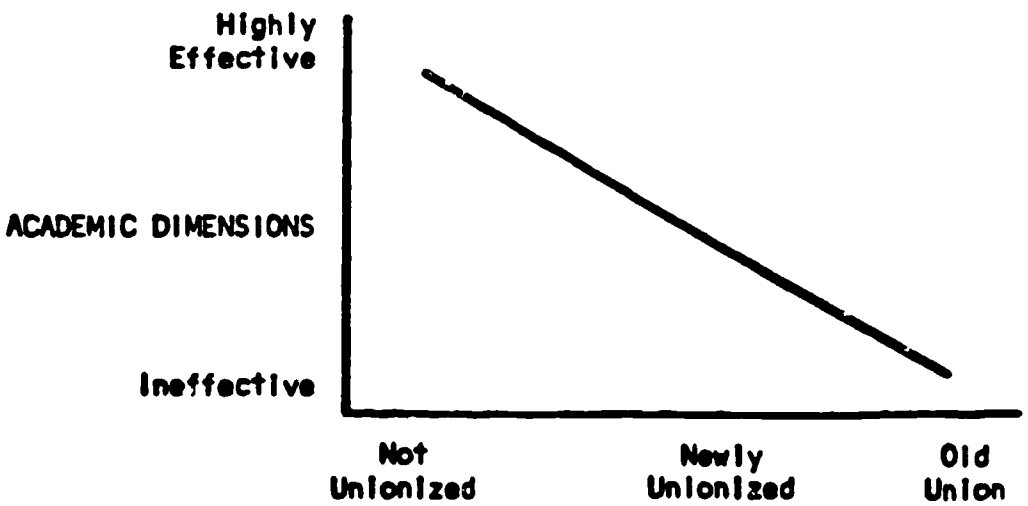


	Student Educational Satisfaction	Student Academic Development	Student Career Development	Student Personal Development	Faculty & Administrator Employment Satisfaction	Professional Development & Faculty Quality	System Openness & Community Interaction	Ability to Acquire Resources	Organizational Health
UNIONIZED $\bar{X}$	4.21	3.71	4.47	4.86	4.49	3.15	4.28	3.14	4.23
sd	.63	.49	.64	.61	.56	.32	.40	.64	.38
NON-UNIONIZED $\bar{X}$	4.88	4.36	4.45	5.17	4.85	3.86	4.37	4.06	4.55
sd	.72	.88	.74	.44	.39	.86	.38	1.05	.43
F RATIO	1.30	3.29	1.57	1.98	2.03	7.18	1.11	2.74	1.22
SIGNIFICANCE	n.s.	.01	n.s.	n.s.	n.s.	.001	n.s.	.05	n.s.

HYPOTHESIZED RELATIONSHIPS BETWEEN FACULTY UNIONISM AND DIMENSIONS OF ORGANIZATIONAL EFFECTIVENESS







FINANCIAL HEALTH INDICATORS

1. Financial Independence - the proportion of revenue received from six different sources
2. Financial Flexibility - the proportion of unrestricted revenues
3. Financial Cushion - the amount of current revenues left unspent
4. Revenue Drawing Power - the ability of the institution to attract revenues
5. Endowment Yield - the amount of endowment income relative to other similar schools

AVERAGE CORRELATIONS OF FINANCIAL HEALTH INDICATORS WITH DIMENSIONS OF ORGANIZATIONAL EFFECTIVENESS

Dimension	Average Correlation
Student Educational Satisfaction	.488*
Student Academic Development	.802**
Student Career Development	-.561**
Student Personal Development	.396*
Faculty & Administrator Employment Satisfaction	.244
Professional Development & Quality of the Faculty	.806**
System Openness & Community Interaction	.055
Ability to Acquire Resources	.783**
Organizational Health	.471*
Indicator	
Financial Independence	.377*
Financial Flexibility	.518**
Financial Cushion	.532**
Revenue Drawing Power	.590**
Endowment Yield	.542**

* $p < .01$
** $p < .001$

MAJOR PREDICTORS OF ORGANIZATIONAL EFFECTIVENESS IN THREE MAIN DOMAINS

MORALE DOMAIN

- Emphasis on academics and scholarship
- Emphasis on student affairs
- A perceived rich external environment
- A perceived supportive external environment

EXTERNAL ADAPTATION DOMAIN

- Proactive strategies implemented
- Emphasis on public relations
- Emphasis on public service
- Emphasis on student affairs
- Little financial independence

ACADEMIC DOMAIN

- Selectivity in student admissions (high quality students)
- Proactive strategies implemented
- Emphasis on academics and scholarship
- A perceived rich external environment
- High revenue drawing power

PREDICTIONS OF THE PERCENT CHANGE IN EFFECTIVENESS SCORES ON EACH DIMENSION
1976 TO 1980

	BETA	CORR	R^2
1. Change in Student Educational Satisfaction			
Presence of a Union in 1980	-.4340	-.4340	.1883
2. Change in Student Academic Development			
Emphasis on Legal Matters	.5469	.5469	
Supportive Environment	.3765	.3321	.4400
3. Change in Student Career Development			
Emphasis on Fund Raising	.3826	.3826	
Complexity of the Environment	-.4519	-.3534	.3419
4. Change in Student Personal Development			
Emphasis on Finances	-.4144	-.4144	.1717
5. Change in Faculty and Administrator Employment Satisfaction			
Environmental Turbulence	-.5971	-.5971	.3565
6. Change in Professional Development and Quality of the Faculty			
Environmental Turbulence	-.6790	-.6790	.4611
7. Change in System Openness and Community Interaction			
Proactive Strategies Implemented	.4676	.4676	.2186
8. Change in Ability to Acquire Resources			
Presence of a Union in 1980	-.4773	-.4773	
Expenditures Per FTE	-.5414	-.4113	
Revenue Drawing Power	.7867	-.0292	.6229
9. Change in Organizational Health			
Environmental Turbulence	-.5091	-.5091	.2592

MAJOR PREDICTORS OF CHANGE IN ORGANIZATIONAL EFFECTIVENESS 1976 - 1980

PREDICTOR	RELATIONSHIP
Turbulent External Environment	NEGATIVE
Presence of a Faculty Union	NEGATIVE
Emphasis on Fund Raising	POSITIVE
Revenue Drawing Power	POSITIVE
Proactive Strategic Orientation	POSITIVE

VARIABLES DISCRIMINATING AMONG INSTITUTIONS THAT DECLINED, REMAINED STABLE, OR IMPROVED IN ORGANIZATIONAL EFFECTIVENESS FROM 1976 TO 1980

Eigenvalue	Canonical Correlation	Wilks' Lambda	Chi Square	d.f.	Significance
15.3088	.9689	.0265	70.771	24	.0000

Variables	Discriminant Coefficient	Correlation with Discriminant Score
Major Doctoral Classification	- .2185	.4405**
General Baccalaureate Classification	1.6837	-.1344
Presence of a Union in 1980	3.3011	-.5776***
Expenditures Per FTE Student	2.2036	.5597***
Percent In-state Undergraduate Students	-2.0901	-.9977***
Change in Enrollment From 1976 to 1980	1.7905	.2675
Turbulent Environment	- .5046	-.0597
Supportive Environment	-2.5093	.6119***
Top Managers Emphasize Internal Affairs	-2.8277	-.4972**
Top Managers Emphasize Fund Raising	-2.8875	.4472**
Top Managers Emphasize Legal Matters	.5453	-.3754*

* p .05
** p .01
*** p .001

Group	Centroid	Percent of Institutions Classified Correctly
Declined in Effectiveness From 1976 to 1980	4.4065	
Remained Stable in Effectiveness	3.2160	100%
Improved in Effectiveness From 1976 to 1980	-3.4222	

MAJOR DISCRIMINATORS AMONG DECLINING, STABLE, AND IMPROVING INSTITUTIONS IN OVERALL ORGANIZATIONAL EFFECTIVENESS, 1976 - 1980

Institutions That Improved

- Slack resources available
- Oriented strategically toward the external environment and the acquisition of resources
- Cosmopolitan in studentbody

Institutions That Declined

- Little slack resources
- Focused on internal institutional affairs
- Adversarial environment, both inside and outside the institution
- Studentbody mostly in-state students

IMPLICATIONS FOR ADMINISTRATIVE BEHAVIOR

1. No institution scores high on all dimensions of organizational effectiveness. Tradeoffs must be made by administrators regarding what kinds of effectiveness will be maximized, and what kinds will be ignored.

2. Because different constituencies have different preferences regarding organizational performance, administrators must consciously select those groups whose preferences will be satisfied.

3. Conservative, reactive, and internally oriented strategies on the part of top administrators are associated with declining effectiveness over time. Proactive, externally oriented strategies are associated with improving effectiveness over time.

4. Acquiring financial slack in an institution, even in times of retrenchment, is an important strategy for maintaining and improving organizational effectiveness.

5. Managing the external environment, so as to produce political slack and institutional legitimacy, is more important in improving effectiveness than is managing internal affairs.

Strategic Responses to Threats of Decline

Domain Defense

The Goal is to Preserve the Legitimacy of the Domain

Domain Offense

The Goal is to Expand the Domain

Domain Creation

The Goal is to Add Related Domains

EXAMPLES OF DOMAIN STRATEGIES

DOMAIN DEFENSE

- Activate support from alumni and trustees
- Form lobbying groups
- Organize consortia and share services
- Acquire increased autonomy from centralized control
- Prioritize consolidation efforts (eliminate black holes)

DOMAIN OFFENSE

- Expand current markets or student groups
- Use current resources to engage in other, non-traditional activities that bring resources
- Do aggressive marketing and recruiting
- Cultivate non-earned revenue sources
- Reaffirm and expand institutional expertise

DOMAIN CREATION

- Add new programs in high demand areas
- Acquire revenue generating subsidiaries
- Engage in capital investment
- Implement public service ventures in neglected areas
- Expand offerings to new geographical areas