Organizational Effects of Decline and Turbulence

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This study clarifies the meaning and conceptual domain of organizational decline by delimiting it operationally from the related constructs of turbulence, stagnation, and environmental decline. We investigated organizational attributes commonly associated in the literature with organizational decline and turbulence. These attributes, including increased conflict, turnover, resistance to change, centralization, scapegoating of leaders, and so on, were investigated in 334 institutions of higher education, along with objective measures of their patterns of decline and turbulence over a six-year period. Results suggest that organizational attributes (e.g., centralization) associated with the actions of top managers are significantly affected by turbulence but not by decline. Organizational attributes (e.g., scapegoating) associated with the actions of organization members who are not top managers are significantly affected by decline but not by turbulence. One implication is that different sources of uncertainty may have differential effects on organizations and that loosely coupled structures may not, therefore, always be effective in buffering the technological core from decline-induced uncertainty.

The increasing emphasis on the temporal aspects of organizations represents a significant trend in the organizational sciences (Miller and Friesen, 1980; Cameron and Whetten, 1981; Whetten, 1987). Evidence of this emphasis is reflected in the extensive use of the life-cycle metaphor to describe organizational changes (Kimberly and Miles, 1980). Several authors writing on this topic have argued that more attention should be given to the non-growth periods of organizational development and evolution (Whetten, 1980; Greenhalgh, 1983; Cameron and Zammuto, 1984) inasmuch as the large majority of life-cycle models consider only patterns of growth, while ignoring decline (Cameron and Whetten, 1983). In response, an extensive literature on the management of decline has emerged within the last several years, in business administration (Starbuck, Greve, and Hedberg, 1978; Taber, Walsh, and Cook, 1979) as well as in such related fields as public administration (Levine, 1978; Biller, 1980), hospital administration (Jick and Murray, 1982), and educational administration (Cyert, 1978; Petrie and Alpert, 1983; Berger, 1983, Cameron, 1983).

However, typical of most new research areas, this literature is uneven and, to a large extent, noncumulative. The development of a systematic body of knowledge on this subject is hindered not only by the confused status of the theoretical literature but also by the paucity of empirical research, especially comparative investigations. Few studies have appeared that compare organizational differences in large samples of growing, stable, and declining organizations within the same population.

To assist in establishing a more solid theoretical and empirical foundation for this field, the current study has two purposes: (1) to clarify the appropriate meaning and conceptual domain of organizational decline by delimiting it from related constructs; and (2) to investigate propositions about organizational attributes commonly associated in the literature with

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This is related to a second source of confusion. In studies in which decline is defined as a significant decrease in the level of resources, it has sometimes been treated as a property of the environment (Starbuck and Hedberg, 1977; Harrigan, 1980; Zammuto and Cameron, 1985) and at other times as a characteristic of the organization (Manns and March, 1978; Greenhalgh, 1982). In principle, environmental decline refers to changes in either the size (e.g., shrinkage in consumer demand) or the shape (e.g., shift in consumer demand) of an environmental niche. Organizations may or may not be affected by these changes. Organizational decline, on the other hand, refers to reduction in resources within the organization itself. The environment may or may not have changed.

A third source of confusion in the decline literature is the failure to distinguish between decline and stagnation (Bozeman and Slusher, 1979; Whetten, 1980). Stagnation and decline both focus on the resource concerns of an organization, and they have been used interchangeably. However, stagnation as a concept may be associated with either growth or decline. A slowdown in growth patterns, for example, may lead to perceptions of stagnation, whereas decline refers to an absolute (and substantial) reduction in resource levels (i.e., a negative slope). Because differences between organizational decline and these three related concepts—turbulence, environmental decline, and stagnation—have not been explicated in the literature, the referent of research findings is often unclear.

To assist in bringing more conceptual precision to the decline literature, we propose the following simple definition. Organizational decline is a condition in which a substantial, absolute decrease in an organization's resource base occurs over a specified period of time. Although brief, this definition contains several critical features. It distinguishes between turbulence and munificence, stating that decline's conceptual roots are linked to the latter, not the former. It also differentiates between declining environmental resources and declining organizational resources. This relationship is far from determinate, being mediated by a variety of internal organizational factors. The definition also differentiates between stagnation and decline by proposing that decline involves a substantial negative slope in a resource curve over a specified period of time, not just a slight depression in upward or downward trends. The term "substantial" may be operationalized in different ways in different studies (e.g., significant difference from industry averages or past trends), so it must be clearly delineated in each investigation. Finally, this definition avoids defining decline in terms of its consequences. Much of the literature on decline has focused on the negative effects of shrinkage and has equated decline and ineffectiveness. Our view of decline is a neutral one: whether it results in positive or negative consequences depends on how it is managed.

Presumed Consequences of Decline

The lack of conceptual clarity we have described is typical of emerging research areas. A related characteristic of a new field is lack of perspective, in the sense that advocates of the new viewpoint tend both to exaggerate its uniqueness as a cause and overstate the breadth of its consequences. While

organizational decline. These propositions will be compared with a similar set of propositions historically associated with a related theoretical concept, organizational turbulence.

Conceptual Domain of Organizational Decline

The meaning of organizational decline has been neither consistent nor clear in the literature. As has been the case with other organizational constructs (e.g., effectiveness, size), this lack of precise definition has often led to confused and contradictory research findings (Cameron and Whetten, 1983; Kimberly, 1976). It is important at the outset of this study, therefore, to specify precisely the conceptual domain of organizational decline.

The literature on organizational decline has derived most of its conceptual foundations from three theoretical traditions. One is the organization-environment literature (Lawrence and Lorsch, 1967; Meyer, 1978; Aldrich, 1979) and, in particular, the resource dependence perspective (Pfeffer and Salancik, 1978). A second is the crisis-management literature (Smart and Vertinsky, 1977; Starbuck, Greve, and Hedberg, 1978; Milburn, Schuler, and Watman, 1983), and a third is the uncertainty literature (Simon, 1962; Thompson, 1967; Cohen and March, 1972).

The organization-environment tradition emphasizes the strategic importance to organizations of controlling critical environmental resources. The crisis management literature has examined the impact of major environmental discontinuities on organizations. A theme common in these studies is that organizations place a premium on predictability and stability in transactions with the environment (Hermann, 1963; Billings, Milburn, and Schaalman, 1980; Nystrom and Starbuck, 1984; Perrow, 1984). Similarly, Thompson (1967:13) identified the "essence of the administrative process" as the management of uncertainty. The prescriptions that have emerged from this literature emphasize eliminating ambiguity, buffering the technical core, and designing systems that can scan the environment so as to process needed information. A contributing theme in this research is that organizational attributes vary according to the amount of uncertainty encountered.

This brief overview of the theoretical context of the organizational decline concept helps highlight three main sources of confusion in this emerging literature, and it suggests possible avenues for clarifying empirically the conceptual boundaries of this construct. These sources of confusion form the basis for this investigation.

First, although the core dimensions of resource munificence and turbulence have been carefully delineated in the research on environmental characteristics (Dess and Beard, 1984), that distinction has broken down in much of the decline literature. Empirically, most investigations have not separated turbulence or fluctuation from absolute decline. The most common procedure to measure decline is to subtract levels of resources at time 1 from levels at time 2 without considering the patterns of fluctuation in between. The effects of turbulence and decline, therefore, have not been clearly differentiated from one another in research.

this intellectual zealousness is understandable, if left unvalidated it can eventually undermine even the legitimate claims of the new perspective.

These traits are evident in the decline literature. Although virtual consensus exists regarding certain proposed dysfunctional consequences of decline, little empirical research has investigated the individual and organizational factors characteristic of declining organizations.[1] Seldom has empirical research been conducted to determine the antecedents or consequences of decline in organizations or how to manage them. Writers generally have agreed that in conditions of organizational decline, conflict, secrecy, rigidity, centralization, formalization, scapegoating, and conservatism increase. Morale, innovativeness, participation, leader influence, and long-term planning decrease (e.g., Hall and Mansfield, 1971; Starbuck, Greve, and Hedberg, 1978; Dunbar and Goldberg, 1978; Levine, 1978, 1979; Whetten, 1980; Jick and Murray, 1982; Petrie and Alpert, 1983; Bourgeois, 1985). The logic of these "outcomes of decline" is explained in detail elsewhere (Cameron, Whetten, and Kim, 1987).

Thus, despite the lack of empirical verification, general consensus exists in the literature that declining organizations are characterized by a wide range of organizational processes that erode organizational effectiveness and undermine member satisfaction and commitment. The management of decline is characterized, therefore, as both operationally difficult and politically hazardous. Thurow (1981:1106) concluded that "there may be no solution to the problem of how to manage decline well. It may simply be impossible."

Presumed Consequences of Turbulence

Environmental turbulence has often been identified as the major challenge facing modern organizations (Drucker, 1980; Cameron, 1984; Huber, 1984). Turbulence exists when changes faced by an organization are nontrivial, rapid, and discontinuous. Following Burns and Stalker (1961), writers have frequently used turbulence and uncertainty synonymously. But a clear conceptual distinction must be made between the rate of change and the unpredictability of change (Miles, Snow, and Pfeffer, 1974). Turbulence usually creates uncertainty, so that uncertainty is best thought of as an outcome of turbulence rather than a synonym. That is, the rapid and hard-to-predict change that is characteristic of turbulence may lead to uncertainty, and indeed, studies have consistently shown that turbulence is the best predictor of perceived environmental uncertainty (Duncan, 1973; Bourgeois, 1980).

Turbulence has figured prominently in most models of environmental characteristics. Emery and Trist (1965), Terreberry (1968), Aldrich (1979), and McCann and Selsky (1984), for example, examined the interconnectedness among environmental elements as a major source of turbulence. Pfeffer and Salancik (1978:68) argued that this high degree of interdependence between organizations creates uncertain and unstable environments and that "changes can come from anywhere without notice and produce consequences unanticipated by those initiating the changes and those experiencing the consequences." Aldrich (1979:69) underscored

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This is not to say that decline cannot stimulate organizational renewal through increased productivity, prioritization of organizational commitments, and renewed personal dedication. A sizable literature has emerged during the past decade codifing the procedures for turning around declining organizations (Hofer, 1980; Schendel, Patton, and Riggs, 1976; Bibeault, 1982; Chaffee, 1984). However, it is evident from these writings that, as its name implies, "turnaround management" involves taking an organization that has been buffeted by the vagaries of diminished resources and setting it on a new course. With rare exceptions, organizations are turned around only after the internal organizational and personal consequences of decline are so pervasive and severe that a consensus around the need for drastic action grudgingly emerges.

the difficulty of coping with turbulence by characterizing these types of changes as "obscure to administrators and difficult to plan for."

Research on the impact of turbulence and its resultant uncertainty on individuals and organizations suggests that feelings of crisis, anxiety, and stress, along with "a narrowing of the perceptual field and limitation of information that can be received, . . . rigidity of response, and primitive forms of reaction" (Withey, 1962:118) occur (Menninger, 1952; Janis, 1962). Organizations experiencing turbulence have been shown to increase centralization and place greater emphasis on efficiency, standardization, and routinization (Zajonc, 1965; Khandwalla, 1978; Starbuck, Greve, and Hedberg, 1978). Bourgeois, McAllister, and Mitchell (1978:508) found that students acting as managers preferred mechanistic over organic structures when facing turbulent environments and that "most managers respond to turbulent environments in a manner opposite to that which is predicted to lead to greater effectiveness."

The consequences of turbulence described in these and other studies are strikingly similar to claims made in the decline literature. When turbulence is encountered, centralization, conservatism, conflict, rigidity, secrecy, and scapegoating of leaders increase, and information sharing, participativeness, long-term planning, morale, innovativeness, and credibility of leaders decrease (Fleishman, Harris, and Burtt, 1955; Hall and Mansfield, 1971; Pfeffer and Leblebici, 1973; Zaltman and Duncan, 1977; Smart and Vertinsky, 1977; Bourgeois, McAllister, and Mitchell, 1978; Bozeman and Slusher, 1979; Staw, Sandelands, and Dutton, 1981).

Because previous studies have not empirically differentiated conditions of decline from conditions of turbulence in studies of organizations, however, the enthusiasm with which authors claim that these attributes are unique consequences of decline or turbulence is still without foundation. The intent of this study, therefore, is twofold: (1) to differentiate operationally the concept of organizational decline from turbulence, environmental decline, and stagnation, and (2) to investigate the extent to which negative attributes that are presumed to emerge in organizations under conditions of organizational decline and turbulence are actually found.

METHOD

In this study, we investigated the relationship between conditions of decline and turbulence and twelve commonly predicted negative attributes that are expected to emerge in organizations when decline or turbulence is present. They are listed and described in Table 1, along with the questionnaire items used to measure them. Whereas some previous studies have investigated one or a few of these attributes, they have never been investigated all together in one study, nor has organizational decline—as differentiated from environmental decline, stagnation, and turbulence—been investigated in multiple, comparable organizations. No attempt is made here to link organizational decline and turbulence causally with the twelve attributes, because the cross-sectional data we collected do not permit it. The individual, group, and

Table 1

Organizational Attributes Associated with Decline and Turbulence

Attribute	Description	Questionnaire Item
Centralization	Decisions are passed upward, participation decreases, control is emphasized.	Major decisions are very centralized.
No long-term planning	Crises and short-term needs drive out strategic planning.	Long-term planning is neglected.
No innovation	No experimentation, risk-aversion, and skepticism about noncore activities.	Innovative activity is increasing [reverse-scored item].
Scapegoating	Leaders are blamed for the pain and uncertainty.	Top administrators are often scapegoats.
Resistance to change	Conservatism and turf protection lead to rejection of new alternatives.	There is lots of resistance to change in this school.
Turnover	The most competent leaders tend to leave first, causing leadership anemia.	There is a great deal of turnover in administrative positions.
Low morale	Few needs are met, and infighting is predominant.	Morale is increasing at this institution [reverse-scored item].
No slack	Uncommitted resources are used to cover operating expenses.	We have no place that we could cut expenditures without severely damaging the school.
Fragmented pluralism	Special-interest groups organize and become more vocal.	Special-interest groups within the school are becoming more vocal.
Loss of credibility	Leaders lose the confidence of the subordinates.	Top administrators have high credibility [reverse-scored item].
Nonprioritized cuts	Attempts to ameliorate conflict lead to attempts to equalize cutbacks.	When cutbacks occur they are done on a prioritized basis [reverse-scored item].
Conflict	Competition and infighting for control predominate when resources are scarce.	Conflict is increasing within this institution.

organizational level literature underpinning this study clearly attribute causal directionality, however (e.g., Staw, Sandelands, and Dutton, 1981; Whetten, 1981; Krantz, 1985), and we have used that assumption to guide this investigation.

Investigating organizations faced with decline and turbulence requires that growing, stable, and declining organizations as well as turbulent and nonturbulent organizations be included in the study for comparison purposes. Moreover, assessing decline and turbulence over a narrow time span (e.g., a year or two) raises the possibility that these conditions are temporary aberrations from normal conditions and that they would be ignored in organizations. It was necessary, therefore, to include organizations in this study for which data about growth, decline, stability, and turbulence could be acquired over several years and for which data were available about the predicted negative organizational consequences.

The organizations selected for study were colleges and universities in the United States, because they met the data requirements (i.e., a substantial number of institutions that are similar in most other respects have experienced conditions of decline, growth, stability, and turbulence over the past several years, revenue and enrollment data were available over a multiyear period, and the associated attributes could be assessed as part of a larger study of organizational performance) and because a great deal of the decline literature has focused on these kinds of organizations (see Zammuto, 1983).

Sample

A stratified, random sample representative of all four-year colleges and universities in the United States was selected on the basis of size (200–20,000 FTE), control (public-private), enrollment and revenue change (growth, decline, stability), and degrees offered (bachelor's, master's, doctorate). Of the 331 institutions studied, 38 percent were public and 62 percent private; 54 percent were small (200–2,500 FTE), 36 percent were medium-sized (2,500–10,000 FTE), and 10 percent were large (10,000–20,000 FTE). This is very close to the demographics of the population of four-year institutions in the U.S. Enrollments and revenues were tracked from 1977 to 1982 using the Higher Education General Information Survey data base.[2]

Four hundred institutions were contacted initially by means of a letter to the president asking permission for the institution to be included in the study. No systematic bias among nonparticipating institutions was detected, and the remaining sample of schools (N = 334) matched the population demographics as well as the originally intended sample. Information on organizational characteristics was gathered in February and March 1983 as part of a larger study of organizational performance, using data from dominant-coalition members: presidents, chief academic, financial, student affairs, institutional research, and external affairs officers, faculty department heads, and trustees. Names of administrators, faculty department heads, and trustees were obtained from each institution, and a questionnaire was mailed personally to respondents, promising anonymity for them and their organizations. Faculty department head and trustee respondents were selected randomly within each institution, but special attention was given to assuring heterogeneity in disciplines (among faculty department heads) and locations and titles (among trustees).

The number of respondents contacted at each institution ranged from 12 to 20 (approximately six administrators, six faculty department heads, and six trustees). In all, 55 percent (3,406 individuals) of those receiving questionnaires responded. Administrators constituted 39 percent of that group, department heads 34 percent, and trustees 27 percent. Three institutions were eliminated from the analyses because they did not have at least one respondent in each of these three job categories, leaving a sample of 331. Response rates for single institutions ranged from 95 percent to 25 percent. Comparisons among respondents holding different job classifications using ANOVA revealed no systematic biases (i.e., the responses to questionnaire items by trustees were not systematically different from the responses to questionnaire items by department heads or administrators).

Concepts and Operationalizations

Questions asked respondents to rate the extent to which certain attributes were present at their school. Using a five-point Likert response format, the questions focused on the twelve commonly predicted consequences of decline and turbulence described in Table 1. Because the questionnaire also assessed a variety of other attributes, length constraints made possible the use of only single-item scales to assess

[2] The year 1982 was selected because it was the most recent year for which financial information was available when the questionnaire data were collected. Five or six months probably elapsed for most institutions between the end of the 1982 fiscal year and the reporting of the organizational attribute data used in our study.

the decline and turbulence attributes. Special statistical analyses, described below, were conducted in order to determine reliability for these single-item measures.

A variety of alternative operationalizations exists for measuring decline and turbulence. Focusing on organizational (not environmental) decline, however, suggests that critical resources inside the organization be considered, not externally based resources such as demographic trends, availability of federal funding, political support, and so on. In this study, therefore, we used changes in enrollments and revenues as well as respondents' perceptions of these changes. Respondents rated the extent to which they thought the institution had experienced decline in revenues or enrollments in any or all of the past four years. One reason for using multiple measures of organizational decline was to determine if the results using decline and turbulence measured one way were different from the results measured another way. As it turned out, results were largely the same whether we used enrollment trends, revenue trends, or respondents' perceptions of them. Consequently, we report here only the results using revenue changes over a six-year period, the 1976–1977 academic year through the 1981–1982 academic year.

This time period was chosen in order to guarantee that enough years were included to map trends, not just short aberrations, but few enough years to identify responses to the phenomena. Revenues were used not only because they are likely to have the most impact on organizational functioning (Cameron, Whetten, and Kim, 1987) but also because it is not unusual for institutions to constrain enrollment growth artificially. This condition of capped enrollments does not represent a true condition of decline. On the other hand, we know of no circumstance in which institutions have voluntarily capped revenue acquisition. In addition, using revenue trends instead of perceptions of them as a measure of decline avoids the problems created by correlating perceptions with perceptions.

Confusion and ambiguity characterize the measurement of decline in the literature. In fact, at least four different measures exist for decline, but no comparison of their appropriateness has ever been made in the literature. After careful analysis of the strengths and weaknesses of the four measures, we selected a regression-slope operationalization as most appropriate in this study.[3] The regression coefficient was obtained by regressing each year's percent revenue change on each time point (using 1977 as a base year). A positive slope indicated growth, a negative slope indicated decline.

A decision was made to categorize institutions into groups according to their patterns of decline and turbulence. This was done in order to remain most consistent with the predictions made in the literature that the attributes associated with decline are discontinuous in their relationships with it—i.e., present under conditions of decline but not present in stable or growth conditions. Moreover, grouping the institutions was intended to distinguish stagnation from absolute decline and determine the extent to which those two conditions may differ (as predicted by Whetten, 1980; and Ca-

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Four measures of decline are (1) time 1 subtracted from time *n*, (2) a mean ratio of yearly changes, (3) yearly resource changes regressed on the previous year's resource level, and (4) yearly resource changes regressed on the previous year. The disadvantage of the first measure [$100 * (T_n - T_1/T_1)$ is that it relies on the absolute level of the first year's resources (which may not be typical), and it ignores variation between year 1 and year *n*. The second measure [(Year 2/Year 1 + Year 3/Year 2 + . . . Year *n*/Year *n* − 1)/Year *n* − 1/number of years minus 1] is insensitive to turbulence during the time period and, by defining decline as statistical significant difference from 1.0, relatively few organizations are included (only 10 of 331 in this study). The third measure is appropriate only when the intercept is zero, or clearly interpretable. However, the interpretation of the intercept is seldom clear in regression equations, and misclassification may occur because of insensitivity to differences in resources patterns. For example, a yearly change of 2, 3, 4, 5, 6, 7 and the pattern 7, 6, 5, 4, 3, 2 would be classified the same based on the regression coefficients (as stagnating). Yet the intercept for the first pattern is +1 and the second −1, and they should be classified differently. The fourth measure—the one used in this study—makes adjustments for different resource levels, takes into account temporal ordering, presents a more accurate picture of the regression slope, allows for trichotomization of the organizations based on cutoff points, and permits direct comparison with a measure of turbulence. A more detailed comparison of these four measures is available from the first author.

meron, Whetten, and Kim, 1987). Cutoff points for identifying the groups were determined from interviews with administrators to determine the level at which organization members actually experience decline.

By dividing the sample into groups instead of using interval data, some variance was lost. However, in this study maximum variance in the variables was not so important as was conceptual clarity and consistency with the predictions of past literature.We feel that grouping institutions was appropriate for at least three reasons: (1) The literature does not predict a linear relationship between attributes associated with decline and revenue change. Rather, these attributes are assumed to be a product of decline alone. The relationship is discontinuous. (2) An important, unanswered question in the literature is whether stability is similar to decline (stagnation) or similar to growth in its organizational consequences. Cameron, Whetten, and Kim (1987), for example, found stability to be similar to decline in its organizational consequences, but other authors (Levine, Rubin, and Wolohojian, 1981) have argued the reverse. Grouping institutions makes a comparison possible. (3) Considerable effort went into establishing accurate cutoff points by interviewing approximately 40 administrators regarding what level of decline was greater than the "just-noticeable-difference threshold." Our intent was to determine with some degree of confidence when an organization actually experienced conditions of decline, stability, or growth. We assumed that attributes associated with decline would more likely be present under conditions where members of the organization were aware of decline. In the interviews (lasting from 30 minutes to 2 hours), questions were asked such as: "How much revenue (or enrollment) decrease occurred before people began defining your institution as being in a condition of decline?" and "What organizational factors do you think were associated with . . . [for example, increased conflict in this institution]?" While quite a lot of variance in responses was obtained, the cutoff points we identified represent the modal percentage response and are near the median. In sum, the cutoff points were selected to try to represent actual organizational experience as well as to create groups that were somewhat similar in size.

As a result of the interviews, institutions that experienced more than a 5 percent drop in revenues (adjusted for inflation) over the time period were classified as declining, those experiencing an increase of more than 5 percent were classified as growing, and all others were classified as stable. Operationally, this 5 percent cutoff point for defining decline and growth dictated that slopes of -1 and $+1$ were used as the decline-growth cutoff points. Using this definition, 60 schools were declining, 72 were stable, and 199 were growing.

A great deal of obscurity and diversity also exists in the literature regarding the appropriate measure of turbulence. The best operationalization is clearly neither simple nor straightforward. In order to assess this construct accurately, its measurement must be separated from conditions of growth or decline. Simply measuring relative variation from the mean or summative change, as has been done in almost all studies that have tried to assess turbulence and volatility objectively (e.g., Tosi, Aldag, and Storey, 1973; Downey, Hellriegel, and

Slocum, 1975; Snyder and Glueck, 1982; Salancik and Meindl, 1984), confounds turbulence with decline and growth. For example, continuous growth over a six-year period may result in large absolute change, but it is doubtful that this change would be experienced as turbulence.

A variety of alternative procedures were considered for assessing turbulence. Because no guidance was uncovered in the existing literature for determining which might be best, we carefully analyzed the strengths and weaknesses of five different measures in the context of a decline study.[4] We chose to measure this construct across the six years with the coefficient of alienation (Cohen and Cohen, 1983), using the same variables as for measuring decline—the percent change in revenues and the time points. The coefficient of alienation is defined as $1 - r^2$, or $(Sd_{y-\hat{y}}/Sd_y)$ and has the advantage of a straightforward interpretation, i.e., the coefficient varies between 0 and 1.0; the higher the coefficient the greater the degree of turbulence; it is uncorrelated with either the mean revenues or the trend to increase or decrease revenues year by year; and it can separate conditions of decline from conditions of turbulence. The higher the regression coefficient for turbulence, the more the institution would experience nontrivial, rapid, and discontinuous changes, and if the slope is negative, the institution would also be in a state of decline.

This study is the first to use such a measure of turbulence, which distinguishes it from patterns of decline. Low levels of turbulence were defined as coefficients of .44 or lower, medium turbulence was between .44 and .75, and high turbulence was defined as coefficients of .76 and higher. These cutoff points divided the sample equally on the three levels (i.e., low = 110 schools, medium = 110 schools, high = 111 schools).[5]

Analyses

To ascertain the reliability of each of the single-item measures of the twelve attributes of decline, a repeated-measures approach was taken. The amount of agreement among respondents within each institution was examined using one-way ANOVA. If more agreement existed in the ratings of the item among respondents within an institution than among respondents outside the institution, one could have confidence in the reliability of the single-item measures. The assumption is that the item is being measured multiple times (across multiple respondents) consistently. A significant main effect for the institution resulted from each item (F's ranged from 1.41 to 1.84, d.f. = 329,3070, $p < .000$), suggesting that each item was reliable in terms of repeated measures.

Multivariate analysis of variance was then performed with the twelve attributes to determine if conditions of decline-stability-growth and of high-medium-low turbulence had significant effects. Next, data reduction techniques were applied to the twelve organizational attributes so that they could be more easily reported. Therefore, factor analysis was performed, resulting in two interpretable factors that included all the attributes but one. Univariate analyses of variance were performed, comparing conditions of growth, stability, and decline on the two factors and comparing conditions of high,

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Five measures of turbulence were considered: (1) the sum of percent change from year to year, (2) the standard deviation, (3) the coefficient of variation, (4) the coefficient of fluctuation, and (5) the coefficient of alienation. The first measure, $[\Sigma\ \%\ \Delta]$, may be difficult to interpret since no upper limit exists, may deflate the amount of actual turbulence present when the change occurs from positive to negative, and more importantly, may mask actual turbulence when a large change that occurs in one year inflates the base for the next year's change. The second measure assesses average variation of yearly change, but actual variation may be misinterpreted because the larger the base rate (e.g., size), the larger the variation. Large organizations may have larger variance but not necessarily more turbulence. The third measure $[\sigma/\bar{x}]$ is the most frequent approach used, but misinterpretation may result because a constantly growing pattern (for example, +5, +5, +5, +5, +5, +5) would be interpreted as more turbulent than a constantly flat pattern (for example, 0, 0, 0, 0, 0, 0), and an outlier year (for example, +2, +2, +2, +44, +2, +2) masks turbulence by increasing both the variance (numerator) and the mean (denominator). The fourth measure (Kim, 1987), $[|\Sigma\ \%\ \Delta| - |\Sigma\ \%\ \Delta|]$, is the absolute value of the percent change from year to year minus the absolute value of the sum of the yearly change for the period. The disadvantages are that no upper limit exists, the measure is insensitive to fluctuation in a continuously growing or declining pattern even though yearly changes are different (for example, +2, +22, +3, +33, +4, +44 would not be interpreted as fluctuating), and a large change in a single year inflates the base rate for the succeeding year. The fifth measure, selected for use in this study, $[\sqrt{1 - r^2}]$, identifies an upper limit to the amount of turbulence possible (the range is 0 to 1.0); it is statistically uncorrelated with the mean resource level or the trend to grow or decline, and several ways can be used to obtain the Pearson correlation coefficient (e.g., the correlation between each year and the previous year's resource change, or between time points and yearly change, the first year, or the mean resource level). Because no rule of thumb exists for deciding what level of coefficient represents true turbulence for a particular organization, using any of these measures, we used the cutoff points developed from the interviews with administrators. A more detailed comparative analysis of each of these measures of turbulence can be obtained from the first author.

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In order to examine whether this procedure of dividing the sample into equal-sized institutional groups biased the results, analyses were conducted with institutions representing the lowest 10 percent of the turbulence scores and the highest 10 percent of the turbulence scores. The results were consistent, indicating that no significant bias characterizes these groupings.

medium, and low turbulence on the two factors. As a check for biased results due to grouping institutions, partial correlations (using the interval, not the categorical data) also were computed between decline (after controlling for the effects of turbulence) and turbulence (after controlling for the effects of decline) and the two dependent-variable factors.

RESULTS

Factor analysis (oblique rotation) produced two interpretable factors from the twelve organizational attributes, as shown in Table 2. One factor seemed to consist mainly of attributes characterizing top-management actions taken in response to decline and turbulence (i.e., centralizing decision making, neglecting long-term planning, instituting across-the-board cuts, and top-management turnover). The other factor appeared to represent attributes characterizing organization members' (other than the top managers) reactions to decline and turbulence (i.e., scapegoating leaders, resisting change, decreasing morale, organizing special-interest groups, increasing conflict, curtailing innovation, and losing confidence in top management). Although this distinction between top-management and organization-member reactions may not be precise, the attributes associated with decline do, intuitively, seem to characterize one of these group's activities more than the other. One of the attributes (loss of slack) did not load on either factor.

Table 2

Factor Analysis of Twelve Attributes Associated with Decline and Turbulence

Factor name and attributes	Factor 1	Factor 2
1. Organization-member responses		
Scapegoating leaders	.658	.044
Resistance to change	.573	.191
Low morale	.724	.078
Fragmented pluralism	.794	−.165
Lost leader credibility	.549	.440
Conflict	.862	.058
No innovation	.450	.113
2. Top-management responses		
Centralization	−.045	.316
No long-term planning	.319	.419
Nonselective cuts	.290	.454
Turnover	.035	.418

Each factor score was generated by summing the items that have the highest loadings on the factor (Kim and Mueller, 1979). Reliability coefficients were computed for each factor (Factor 1, $r = .88$; Factor 2, $r = .53$). The coefficient for Factor 2 is not high, but Nunnally (1979) treated .50 as marginally acceptable in exploratory research such as this. These two factors, therefore, serve as the dependent variables for the rest of the analyses.

Tables 3 and 4 report the results of the multivariate and univariate analyses of variance for decline and for turbulence. No significant interaction effect occurs between the two main conditions—decline and turbulence. However, a significant main effect does occur for decline ($p < .01$), and for turbu-

Table 3

Multivariate Analysis of Variance for Decline and Turbulence, Using Associated Organizational Attributes

MANOVA source*	d.f.	*F*	*p*
Decline (D)	24,624	1.86	.01
Turbulence (T)	24,624	1.72	.02
Decline × turbulence	48,1256	1.00	.46

* The most robust and conservative test, Phillais trace, was used to test the MANOVA results.

lence ($p < .02$) in the MANOVA. This suggests that the presence of negative organizational attributes is significantly more likely under conditions of decline than under conditions of growth and that the same is true for high turbulence, as opposed to low turbulence.

To determine more precisely and parsimoniously the meaning of these main effects, univariate analyses of variance were computed. Under conditions of decline, significant differences appeared in the organization-member response factor but not in the top-management response factor. Under turbulent conditions, the opposite was the case—significant differences occurred in the top-management response factor but not in the organization-member response factor. Again, no significant interaction effect exists between decline and turbulence.[6]

These results suggest that top managers tend to respond differently under conditions of high turbulence than under conditions of low or medium turbulence. However, they do not respond differently when faced with decline than with growth or stability. Turbulence has an important association with top-management responses, decline does not. On the other hand, the results suggest the opposite for organization members. Organization-member responses are most powerfully associated with decline, not turbulence. The best predictor of negative organizational attributes being associated with organization member responses is the presence of decline. Turbulence has no significant association with organization-member responses.[7]

Because some readers may question whether or not biased results were produced by clustering the institutions into

6
Analyses of variance also were conducted in which the interaction effects of organizational size (total FTE) and organizational control (public-private) were examined. Past literature has suggested that these might be important moderators of main effects in colleges and universities. However, no significant interaction effects result in any of the 14 analyses; hence, these variables are not discussed further in this study.

7
Multivariate and univariate analyses of variance do not produce information about differences in the cell means for decline or for turbulence. Moreover, with no significant interaction effects present, cell contrasts are not called for. However, an examination of cell means for the two factors showed significant differences between conditions of growth and decline but not between growth and stability. This supports the argument that organization members respond to conditions of stability more as decline-as-stagnation than as slow growth (Whetten, 1980; Cameron, Whetten, and Kim, 1987).

Table 4

Univariate Analyses of Variance, Using Two Factors

	Organization-Member Responses				Top-Management Responses			
ANOVA source	Mean square	d.f.	*F*	*p*	Mean square	d.f.	*F*	*p*
D	410053	2	2.94	.05	123278	2	1.03	.36
T	75445	2	.54	.58	885260	2	7.37	.00
D × T	76394	4	.55	.70	192590	4	1.60	.17
Residual	139268	322			120168	322		

growth, stability, and decline groups, as well as into three levels of turbulence (thus losing variance), partial correlational analysis was also done, using the interval data on decline and turbulence. Table 5 shows that the relationship of decline (partialling out the effect of turbulence) and turbulence (partialling out the effect of decline) with the two organizational attribute factors is similar to the results produced by the ANOVAs. A significant correlation exists between decline and organization-member responses but not top-management responses. The reverse relationship occurs in the case of turbulence. These results lend support to the proposition that when turbulence is held constant, top managerial actions appear to be similar whether decline or growth is faced. It is the presence of turbulence that most affects managers' responses. Positive responses of organization members, on the other hand, are associated with conditions of growth, and negative responses are associated with decline. Conditions of turbulence have little effect.

Table 5

Partial Correlations between Organizational Decline and Turbulence and Organization-Member and Top-Management Responses

Organizational Condition	Organization-Member Responses		Top-Management Responses	
	Partial *r*	*p*	Partial *r*	*p*
Decline	.11	.03	.02	.36
Turbulence	.06	.12	.15	.00

CONCLUSIONS AND IMPLICATIONS

In this study, a variety of organizational attributes were investigated to determine their association with conditions of decline and with turbulence. These attributes have been identified in the literature as products of both organizational decline and turbulence. When rated by observers as to their occurrence in colleges and universities, they form two main factors: attributes associated with the reactions of organization members and attributes associated with top-management responses. Analyses of variance, as well as partial correlational analysis, revealed that organization-member responses are affected by the presence of decline, but not turbulence. When decline is present, organization-member responses are characterized by significantly more scapegoating of leaders, resistance to change, low morale, fragmented pluralism, withdrawal of leader credibility, conflict, and curtailment of innovation than under conditions of growth. The opposites of these attributes are present to a significant degree in conditions of growth. The presence of high or low turbulence, however, does not affect these attributes one way or the other.

On the other hand, attributes characteristic of top-manager responses are significantly affected by turbulence but not by decline. That is, significantly more centralized decision making, absence of long-term planning, nonselective cuts in resources, top-administrator turnover, and loss of leader credibility occur when high turbulence is experienced. The

opposites of these attributes are present under conditions of low turbulence. The presence of decline, however, does not affect these top management attributes significantly.

We can only speculate at this point on an explanation for these findings. However, the differential effects of turbulence and decline reported in this study appear to reflect the division of responsibility in colleges and universities in who bears the costs of different forms of uncertainty. Previous research by Hannan and Freeman (1975), for example, found that under conditions of decline, administrators in schools tended to respond by cutting back nonadministrative positions. If dynamics are similar in this study's organizations, this implies that the responsibility for absorbing the costs of decline falls disproportionately on organization members. It might be expected that this group, feeling more vulnerable to and threatened by the effects of decline, would be characterized by behaviors dysfunctional for the organization. This argument is also consistent with recent discussions by Greenhalgh and Rosenblatt (1984), Brockner, Davy, and Carter (1985), and others, in which they demonstrated the dysfunctional psychological consequences of job layoffs. Specifically, they described the negative impact of decline-induced employment insecurity on the contentment and commitment of organization members.

Top-management responses may not be differentially affected by decline because the primary response mandated by conditions of decline, resource acquisition activities, is a continuing challenge for top managers no matter what the pattern of resource change experienced by the institution. The central role of top managers in colleges and universities is tied very closely to this resource-acquisition responsibility in times of growth as well as decline (Cameron, 1986). Decline, therefore, may be experienced as less ambiguous and less threatening than high turbulence.

During times of turbulence, however, the brunt of the consequences of uncertainty falls on the top-management cadre. Unlike conditions of decline, in which top management may react by projecting the consequences onto organization members (e.g., Hannan and Freeman, 1975), turbulent conditions activate the buffering function of management (Thompson, 1967). That is, the information-processing role for management requires that uncertainty be reduced and that managerial decision processes provide continuity in the organizations (Galbraith, 1977; Leblebici and Salancik, 1981). Organization members are thus buffered from turbulence by top-management action, as well as by the loosely coupled design of higher-education institutions (Meyer and Rowan, 1978).

For top managers, who must deal with these conditions, turbulence reduces their ability to make long-term projections regarding future resource levels, yet managers in colleges and universities still need to make decisions that have long-term consequences (e.g., tenure, curriculum, and staffing decisions). Moreover, the vagaries of a fickle resource base multiply the pressures on managers to accentuate even more their planning and resource acquisition activities, thus increasing stress and turbulence. In the presence of these con-

ditions, it is quite understandable that top managers would tend to centralize control over decision making, truncate long-term planning, apply conservative cutback strategies, and leave the institution when less stressful opportunities become available.

Despite the somewhat speculative nature of the findings' interpretations, these results do suggest three important implications for organizational theory. First, the presumed advantages of loosely coupled structures in turbulent conditions may not be universal throughout the organization. Colleges and universities are often described as having loosely coupled stuctures (Weick, 1976; Meyer and Rowan, 1978). Simon (1962, 1973), Thompson (1967), Aldrich (1971), Glassman (1973), Cohen and March (1972), and others have touted the advantages of loose coupling for buffering the technical core and producing adaptability in organizations. The basic assumption is that environmental jolts and encroachments can be easily absorbed by individual units without negatively affecting the whole system, and coordination and information processing are more efficient. Rubin (1979:220) found in a study of five universities, however, that "the hypothesized benefits of loose structure did not generally occur [in universities experiencing decline]." Loose coupling was not as adaptive as expected. In our study, the loosely coupled structure of these institutions seemed to help buffer organization members (non-top managers) from the negative attributes associated with turbulence, but it did not buffer them from the attributes induced by decline. The structural advantages of looseness were mixed.

One possible inference from this finding is consistent with Brinton's (1938) early theories of revolution in organizations (adopted by others, such as Miller, 1960; Stein, 1960; Scott, 1972; Scott and Hart, 1979; and Durham and Smith, 1982). Brinton's theory suggested that decline and deterioration in organizations inspire revolution, which ultimately terminates the tyranny of inefficiency. Bloated bureaucracies require insurrection as a prerequisite to turnaround. This study's results may imply that the negative attributes associated with organization-member responses (e.g., conflict, scapegoating) may be akin to pre-insurrection reactions, but they are not experienced by the institutions' top managements. Thus, organizational decline may paradoxically be both functional and dysfunctional at the same time—frought with conflict, resistance, and recalcitrance, while at the same time sowing the seeds of effective long-term adaptation and survival.

A second implication of this study relates to the implicit association that exists in the literature between organizational decline and turbulence and organizational uncertainty (Bourgeois, 1985). These results may suggest that the uncertainty assumed to result from decline and turbulence in organizations reflects itself differently depending on which condition produces it. Even though decline and turbulence have not been differentiated operationally in the literature, and predictions of organizational consequences are universalistic, this study implies that the source of uncertainty may be an important moderator. Uncertainty created by turbulence may have significant effects on organizational attributes associated with top-management responses but not with organi-

zation-member responses. Uncertainty created by decline may have significant effects on organizational attributes associated with organization-member responses but not with top-management responses.

One possible inference from this finding is that, in order to capture the main source of variance, studies of decline should focus more on the factors in organizations associated with organization member (non-top manager) processes and outcomes. Studies of turbulence should focus more on organizational attributes associated with top-manager actions. Most studies of organizational uncertainty up to now have limited themselves to the top-management perspective. In studies in which organizational decline produces the uncertainty, this may not be the appropriate area of focus.

Another possible inference is that future research should be sensitive to a more fine-grained conceptualization of uncertainty, based on its sources. One reason for the continued marginal support for contingency theories linking environmental uncertainty and organizational designs may be that the source of uncertainty can have differential effects on different parts of the organization. Focusing on the wrong organizational attributes may produce spurious results.

A third implication entails an opposite point of view from the first two. Up to now, we have followed the dominant perspective in the literature, namely that the presence of organizational decline leads to dysfunctional organizational attributes. However, the opposite perspective is also viable, inasmuch as we have not tested for temporal precedence in our data. That perspective suggests that organizations typified by dysfunctional attributes—scapegoating of leaders, resistance to change, low morale, fragmented pluralism, conflict, and no innovation—may perpetuate decline. Organizations simply may not be able to maintain a growth pattern while harboring these dysfunctional conditions. Moreover, when centralization is high, planning ceases, nonselective cutbacks occur, turnover is high, and leader credibility is low, turbulence (marked fluctuation in both growth and decline) may also be perpetuated.

This perspective has theoretical implications as well, inasmuch as many of these dysfunctional attributes represent Likert's (1967) System 1 characteristics and are predicted to be ineffective. A mismatch between positive organizational attributes and the demands of the environment is also consistent with the congruence theories espoused by Nadler and Tushman (1983), Galbraith and Kazanjian (1986), and others. Lack of fit produces decline and ineffectiveness; therefore, the presence of dysfunctional attributes may be nonadaptive.

Of course, without longitudinal data it is impossible to determine which theoretical explanation is valid—whether decline causes dysfunctional attributes or dysfunctional attributes cause decline. Most likely, both are at least partially true. By clarifying the concept of decline, however, and separating it from related concepts, this study makes it possible to investigate this causal directionality. Moreover, because organizational decline and death are occurring at a record pace in the United States, because the popular press is filled with descriptions of a hyperturbulent postindustrial environment, and

because decline, downsizing, and retrenchment are the most frequent organizational changes in large organizations today (Cameron, Sutton, and Whetten, 1988), such studies of causality will be requisite, for both practical and theoretical reasons. Practicing managers as well as organizational theorists will benefit from researchers paying attention to issues of causality.

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