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Prediction, understanding, and control as antidotes to organizational stress

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This article proposes prediction, understanding, and control as antidotes to stress, examines their relevance for organizational research, and describes their implications for managerial practice. By using the term *antidote* we do not mean to imply that all stresses are poisonous or that they can be completely counteracted. Rather, we mean that prediction, understanding, and control act in a variety of specific ways to reduce organizational stress or to relieve its negative effects.

Studies of stress have become numerous in organizational and medical research; investigators are apparently undeterred by the vagueness of the concept and the disparate definitions and measures in current use. Such problems, however, persist. Even the fundamental question of whether stress is to be regarded as an external stimulus (Lazarus 1966) or as a reaction of the organism (Selye 1956, 1971) remains unresolved.

We concur with Lazarus in finding the engineering analogy clarifying for theory and suggestive for empirical research. Engineers define a stress as an external force applied to some object or construction, and strain as the resultant change (distortion, compression, destruction) in that object. Applying this definition in organizational settings, we will distinguish between objective stresses (demands and pressures, constraints and deprivations) imposed on individuals and the consequent strains (dissatisfactions, performance decrements, psychological and somatic symptoms).

Research along these lines, despite methodological and definitional problems, has discovered consistent and significant relationships between various organizationally generated stresses and individual strains. Much of this research has been summarized, with varying degrees of enthusiasm, by McGrath (1976), Kasl (1978), Katz and Kahn (1978), Beehr and Newman (1978), McLean (1979), and House (1981). In 1982, the *Journal of Occupational Behavior* devoted an entire issue to studies of stress (Jick and Burke 1982), and the Institute of Medicine published a major evaluation of stress research and its prospects (Eisdorfer and Elliott 1982). Stress research is reported on a continuing basis in *The Journal of Human Stress*, which began publication in 1975, and in two book series on occupational stress, one edited by McLean for Addison-Wesley and the other by Cooper and Payne for Wiley.

As might be expected, this quantity of stress research has discovered a formidable number of stress-strain relationships that are relevant for organizational theory, for example, between role conflict and psychological tension (Kahn et al. 1964); between machine-paced work and adrenaline levels (Frankenhauser and Gardell 1976), and between responsibility for the well-being of others and the prevalence of such diseases as hypertension, peptic ulcer, and diabetes (Cobb and Rose 1973). The many studies of stress and strain vary greatly in the adequacy of their population samples, the specificity with which
stress and strain are defined, and the objectivity with which they are measured. In some studies, stress is wholly inferred from occupational titles. In others, both stress and strain are measured entirely by self-report. Moreover, the findings tend to be weaker when the measures of stress and strain are methodologically independent of each other rather than based on self-report, a pattern that is strongly suggestive of correlated error. Kasl (1978) describes some painful examples of overreliance on self-reported data in stress research, and of the resulting trivialities.

Setting aside such problems, however, students of stress and strain have had to confront the fact that the relationship between the two, while often significant, is seldom large; correlations in excess of .40 are rare, and correlations around .20 are common. Researchers have sought to account for these persistent but limited findings in two main ways: by demonstrating that certain personal characteristics (gender or age or type A personality) make some individuals "strain-prone" and others "strain-resistant," and by identifying situational variables that have similar interactive effects. Social support is by far the most studied of these situational stress-buffering variables.

For example, in a study of scientists, engineers, and administrators, French (1974) reported a correlation of .35 between role ambiguity (an organizationally imposed stress) and serum cortisol (an indicator of physiological strain) among employees whose relations with their subordinates were poor, but a correlation of only .06 among those whose relations with their subordinates were good. The difference between these two correlations was interpreted as the buffering effect of supportive relations. In the same study, similar findings were reported between workload and systolic blood pressure, with a correlation of .33 among the scientists, engineers, and administrators whose relationships with their own supervisors were poor, but a correlation of only .06 among those who reported good relations with their supervisors. In a number of parallel analyses the stress-strain correlations for people with poor relations to their colleagues were significantly higher than the correlations for those with good relations.

Cobb (1976) reviewed a broader literature of stressful events and associated indicators of strain to see whether the stress-strain relationship was regularly reduced in the presence of social support. He reported that buffering effects of social support were apparent in the relationship between intrusive situational changes and pregnancy complications (Nuckols, Cassel, and Kaplan 1972), between hospitalization and psychological reactions among children (Jesner, Blon, and Waldfogel 1952), between surgical operation and speed of recovery (Egbert et al. 1964), between severe life stresses and affective disorder (Brown, Bhrolchain, and Harris 1975), between job stress and escapist drinking (Quinn, cited in Katz and Kahn 1978), between job loss and symptoms of rheumatoid arthritis (Gore 1973), and between job loss and elevation of cholesterol level (Cobb 1974). More recent studies in work settings (Cobb and Kasl 1977; House and Wells 1978) have presented additional evidence for the stress-buffering effects of social support.

This line of research is not without problems, however. First, the buffering effect, when measured as an interaction term in the stress-strain equation, is not always observable (Pinneau 1975; Andrews et al. 1978; LaRocco and Jones 1978; Lin et al. 1979). Second, many of the studies reporting significant buffering effects of support present serious methodological deficiencies—a fact that has been pointed out mainly by scholars who sought such effects unsuccessfully in their own data. LaRocco, House, and French (1980) have done a great deal to clarify these inconsistencies in research findings and to explicate the mechanisms or pathways by which social support works. They present evidence that the buffering hypothesis is supported for physical and mental-health variables such as somatic complaints but not for job-specific strains such as job dissatisfaction. Such research on social support will continue, and should. In this chapter, however, we wish to urge an additional line of research. The discovery of social support as a variable that can moderate the relationship between stress and strain should stimulate a search for other variables with stress- or strain-reducing properties. Support is not a sovereign remedy for stress, and there is no reason to think that it is unique in its antidotal effects.

We propose three variables that deserve investigation as stress-strain antidotes in organizational life: prediction, understanding, and control. We hypothesize, for example, that a stress of a given type and magnitude will create less strain when the affected individual can predict the time of its onset, its magnitude, and its duration. We would also expect that the understandability of the stress—that is, knowledge of its causes, origins, and pathways—will have effects similar to those of predictability, yet independent of them. Finally, we expect that control by the stressed individual—for example, control over the timing of the stress—will have both main effects (stress reduction, strain reduction) and interaction effects (reduction of the stress-strain relationships).

The triad of prediction, understanding, and control is of course not new to research workers. These concepts are the alleged and reiterated aims of research itself, of science. It is not unreasonable, we believe, to propose that the goals and motives of men and women everywhere,
as they try to make sense of their world and anticipate the opportunities and hazards it presents, are like those of scientists in these important respects. Scientists and other citizens engage in tasks of some underlying similarity, although that similarity is masked by differences in conceptual language, apparatus, and modes of investigation. And, of course, scientists and nonscientists share the unavoidable human limitation of bounded rationality in their efforts to predict, explain, and control their world.

In the remainder of this chapter we will review the wide-ranging research literature that encourages us to consider prediction, understanding, and control as hypothetical antidotes to stress in organizational settings; we will present a model for the relationship of these antidotes to stress and strain; and we will discuss the implications of this model for organizational theory and research, as well as for managerial practice.

**PREDICTION**

Prediction is the ability to forecast the frequency, timing, duration, and quality of events in one's environment. The main effects of the lack of predictability at work are well established in the literature on role ambiguity (for reviews see Kahn, 1974; Katz and Kahn 1978, chap. 17; or Pearce 1981). Pearce (1981) observes that most studies of role ambiguity (e.g., Rizzo, House, and Lirtzman 1970; Lyons 1971; Ivancevich and Donnelly 1974) operationalize the concept as a generalized information deficiency rather than as the unpredictability of specific events. However, some rigorous research (e.g., Caplan 1971; Caplan et al. 1975; Beehr 1976) has employed measures of role ambiguity that emphasize the unpredictability component.

This research on the lack of prediction has uncovered potent main effects on behavioral, psychological, and physiological strain. Of particular interest is Caplan's (1971) finding that the frequency of unscheduled work interruptions is related to such strains as elevated heart rate and serum cholesterol level. Unpredictable events tend to disrupt organized response sequences, and such disruption has been described as stressful to all organisms (Mandler and Watson 1966).

While the association of unpredictability and strain has been fairly well documented in cross-sectional research on organizations, the potential of predictability as an antidote to job stress has not been demonstrated experimentally in organizational settings. Data from laboratory research, however, suggest that the ability to forecast the frequency, timing, and qualities of a stressor considerably reduces its negative impact. Seligman's (1975) experimental work on predictability and unpredictability has been especially influential. He presents the signal/safety hypothesis: when a stressful event can be predicted, the absence of the stressful event can also be predicted. Thus, the person knows when he or she can relax, and need not be in a constant state of vigilance or anxiety. As an example of the signal/safety phenomenon, Seligman cites the function of air-raid sirens during the bombing of London in World War II. The air-raid sirens worked so well as a signal that people could go about their business without immediate fear (i.e., in safety) a large percentage of the time; vigilance and protective action were required only when the sirens sounded.

Empirical support for the signal/safety hypothesis is provided by a number of laboratory studies with animals (Seligman 1968; Weiss and Strongman 1969; Seligman and Meyer 1970; Byrum and Jackson 1971) and with human beings (Glass and Singer 1972; Price and Geer 1972; Staub and Kellet 1972). The setup of these experiments varied, but a common arrangement in the animal research involved the delivery of electrical shocks at irregular intervals through a metal grid or floor and, for a random subset of animals, the use of a buzzer or light as a warning signal just before the shock. In all these experiments, aversive stimuli were found to have a weaker negative impact on subjects, both animal and human, that were able to predict the onset, duration, magnitude, or nature of the stress. This research appears to have profound implications for stress at work.

Job stressors that cannot be predicted may, by definition, appear at any time. According to the signal/safety hypothesis, this fact implies a constant state of anxiety, because the person never receives a "signal" that he or she is safe, even for a short period of time. Such unpredictability, however, requires further specification. Any aspect of a stimulus may be unpredictable—its nature or quality, its time of onset, its strength or magnitude, its duration, and the like. Seligman emphasizes timing and strength. If both are predictable, persons at risk can relax most of the time and marshal their resources appropriately when required. The strain of continual vigilance or inappropriate mobilization is obviated.

Organizational researchers have not attempted to test the signal/safety hypothesis explicitly in any of its aspects. Nevertheless, some organizational research can be interpreted as supporting the proposition that predictable job-related stressors are less threatening than unpredictable stressors. Studies of organizational socialization (Van Maanen 1976; Schein 1978) indicate that the frustration and anxiety of new members are related to the gap between their initial expectations about the job...
and the actual attributes of the new role. In other words, lack of ability to forecast events increases the stress associated with a life change that is already threatening for most people—entry into a new social system. Perhaps this is one of the reasons that realistic job previews appear to reduce turnover among new employees (Wanous 1973; Ilgen and Seely 1974).

Indirect evidence for the value of predictability as an antidote is also found in research on job transfers. Brett (1980) has recently conducted an excellent review of the literature on job transfer. She reports that, as one would expect, transfers are more disruptive when the new job and work environment are dissimilar to the old. Brett suggests that disruption may be greater because dissimilarity implies lack of knowledge about behavior-outcome contingencies in the new setting. In other words, unpredictable stimuli (both threatening and benign) are more stressful than predictable stimuli.

**UNDERSTANDING**

Understanding, in this context, is knowledge about the causes of significant events in the workplace. If predictability involves questions of *what* and *when*, understanding involves questions of *how* and *why*. Little organizational research has been conducted directly on understanding. Studies that explore opportunities for learning on the job (Rousseau 1978), task identity and feedback (Hackman and Oldham 1975), and social support as information from others (Caplan et al. 1975) are relevant, however. Information from co-workers and from task performance itself may increase knowledge about the causes of events at work. For instance, the positive relationships observed between feedback and job satisfaction (Hackman and Lawler 1971; Hackman and Oldham 1975) may involve understanding as an unmeasured intervening variable. This is a testable, but as yet untested, hypothesis.

Until such hypotheses have been tested in organizational settings, arguments for the antidotal effects of understanding must come from other sources. Three are of particular relevance: (1) the conceptual distinction between prediction and understanding as it has been made in other fields, (2) the substantial body of research that implies a human need to understand, and (3) the suggestion in some laboratory research that understanding and prediction have different empirical consequences even for animals.

The conceptual distinction between prediction and understanding is explicit in our definitions; it is the difference between (1) knowledge of the timing, duration, magnitude, and quality of a future stimulus; and (2) knowledge of its causes and the mechanisms by which it acts. The distinction is familiar to research workers, who often find that they can predict an outcome but cannot specify the pathways or mechanisms by which it is produced. In medicine, for example, the pain-relieving effect of aspirin and the contraceptive effect of intrauterine devices are established beyond doubt, but research biochemists and physiologists are not yet able to specify fully the pathway or sequence of physiological events by which either of these effects is created. They say, and we concur, that in these cases prediction exceeds understanding and that the two are distinct.

Theorists' postulations of universal human needs have generally produced more long lists than good theory; nevertheless, the assumption of a motive to understand significant aspects of one's environment underlies a great deal of research and practice. The "Aha!" experience of gestalt psychology—the momentary feeling that accompanies the recognition of a pattern or the sudden grasping of the solution to a problem—implies a drive to understand and a release of tension when understanding is attained (Kohler 1929). Another example comes from psychoanalytic theory and practice, which assume that insight into the causes of one's own behavior (understanding) is not only a necessary step in altering behavior but is itself a means of relieving neurotic symptoms (Dollard and Miller 1950). In social psychology, the tendency of human beings to create causal explanations, even from the most meager perceptual cues, was demonstrated in Heider's (1958) classic experiments. More recently, cognitive social psychology has become the dominant subfield of that discipline, and the attribution of cause under conditions of uncertainty is a central issue in cognitive psychology.

For example, experimental subjects who are required to make predictions under conditions of uncertainty, drawing on data provided by the experimenter, rely most on those facts that enable them to make causal attributions (Ajzen 1977; Nisbett and Ross 1980; Tversky and Kahneman 1980). So powerful is the propensity to seek causal explanations that experimental subjects tend to neglect information that would enhance their predictions but would not contribute to their implicit theories about the causes of events.

Finally, some research with animals also suggests that understanding is empirically distinct from prediction. Animals that have been trained to work for food by pressing a lever show adverse physiological reactions (elevated plasma corticoids) when reinforcement contingencies are changed so that regular lever pressing no longer produces food (Coover, Goldman, and Levine 1971). This finding is interpreted by Levine (1982) as an
effect of unpredictability rather than deprivation, because the animals continue to be fed regularly. When the experiment was varied by removing the lever itself, however, the animals did not show the same adverse physiological responses. Kahn (1981a) suggests that in the latter case the animals were able to "understand" the situation; they noticed that the food-producing lever had been removed. This research implies that understanding the cause of a stress may serve as an antidote independent of control or prediction.

CONTROL

Our concept of control in organizational settings is straightforward; it consists of a dependent relationship between the behavior of an organizational member and the subsequent occurrence of outcomes in the work environment desired by that member. Control is thus the exercise of effective influence over events, things, and persons. Its opposite, as Seligman's (1975) work makes clear, is helplessness.

The importance of control over one's immediate environment is a persistent theme in the behavioral science. Adler stated in 1930 that the control of one's relevant environment is "an intrinsic necessity of life itself" (cited in Langer and Rodin 1976, 398). In more recent years, Seligman's (1975) work on learned helplessness in animals and humans, Rotter's (1966) research on locus of control, Lazarus's (Lazarus 1966; Lazarus and Launier 1975) investigations of "direct action" in coping with stress, and Bandura's (1977) experiments on self-efficacy all emphasize that difference between behavioral responses and preferred outcomes in one's environment has important consequences for well-being.

Such dependence is also a persistent theme in the literature of occupational stress, although the label "personal control" is rarely used. Writings on participation in decision making (Alutto and Belasco 1972; Caplan et al. 1975), autonomy (Hackman and Lawler 1971; Hackman and Oldham 1975), authority (Kay 1974), power (Kahn et al. 1964), and alienation (Blauner 1964; Seeman 1972) focus on the relationships among organizational properties, individual behavior, and desired outcomes in the work environment.

Additional evidence that links control with well-being, at least by implication, comes from research that demonstrates the negative consequences of lack of control. Laboratory research on learned helplessness suggests that independence between outcomes and responses may directly reduce motivation (Thornton and Jacobs 1971), interfere with cognitive processes (Kemler and Shepp 1971), and lead to emotional disturbances such as depression (Roth and Kubel, cited in Seligman 1975).

The link between lack of control and poor mental and physical health is also visible in the job-stress literature. Caplan et al. (1975), found substantial relationships between lack of participation in decision making, boredom, and job dissatisfaction. These latter variables in turn predicted anxiety, depression, and somatic complaints. Similar patterns are found in research on lack of autonomy (Hackman and Oldham 1975) and on alienation (Blauner 1964).

The persistence of such "control effects" and their diffusion across different life roles have yet to be fully explored. Most of the relevant field studies are cross-sectional, attempt to assess chronic conditions of control or its absence, and do not measure off-the-job consequences. Nor have the field studies made explicit the pathways through which control has its effects.

Many such paths are possible. For example, the perception of control may cause an individual to construe an aversive event as less threatening independently of any main effects of control on strain. A number of experiments indicate that subjects with control over an aversive stimulus are more likely to tolerate higher levels of that stimulus than subjects who do not have control. Experiments of this type have been conducted with stimuli such as shock (Bowers 1968), cold pressor pain (Kanfer and Seidner 1973), and noise (Glass, Singer, and Friedman 1969). In fact, Thompson (1981) reports that perceived control has been consistently linked to tolerance for adverse stimuli, although not to arousal at impact of the stimulus and not to perceived pain caused by the stimulus.

Most laboratory experiments on control do not measure postexperimental behaviors. Some experimenters (Glass and Singer 1972; Mills and Krantz 1979), however, have done so. They report that lack of control has a negative impact on the performance of tasks attempted after the experiment has been completed. Seligman (1975) would interpret these findings as short-term examples of learned helplessness. Thus, both laboratory research on general stress, and field research on organizational stress suggest that control has potent main effects on well-being. Some studies indicate that control can also reduce strain through indirect mechanisms as well.

A field experiment by Langer and Rodin (1976) provides compelling evidence both for the indirect benefits of personal control on well-being and for the complex paths by which such benefits are attained. Members of the experimental group in the Langer-Rodin study of nursing-home patients attended a "pep talk" that encouraged them to take greater control over their lives. They were then asked to care for a house plant that was
placed in their room, and to choose which night they would attend movies shown by the nursing-home staff. Members of the control group attended a lecture emphasizing all the things the staff could do to help them. They were told that the plants in their rooms would be cared for by the staff, and they were also told on which nights they were to attend the movies.

The results of this seemingly modest experimental intervention were impressive. Members of the experimental group chose to participate in more recreational activities and expressed more positive attitudes toward life in general. Moreover, an eighteen-month follow-up by Rodin and Langer (1977) indicated that a lower percentage of patients in the experimental group had died during the intervening period. We assume that control over mundane matters in life, such as which night to watch a movie or when to water a plant, do not have powerful main effects on stress or strain. The other demands and constraints of nursing-home routine were not directly affected by the experimental manipulation. The Langer-Rodin findings tell us not that these threats to well-being were eliminated but that they had fewer negative effects on members of the experimental group. The relationship between these stresses and the consequent strains (negative attitudes and mortality) was reduced or buffered by the experimental intervention.

Both the direct stimulus-modifying effects of control on stress and the indirect moderating effects of control on the stress-strain relationship have been well demonstrated in organizational settings. Pasmore and Friedlander (1982) describe a field experiment in which increased employee control appears to have produced what Averill (1973) called “stimulus modification,” that is, the direct elimination or reduction of stressful stimuli.

This action-research project addressed a recalcitrant problem of high-on-the-job injury rates by increasing the level of employee participation. A representative group composed of five workers, two supervisors, and the manager of employee relations was chosen to work on the problem. This group and the action-research team together conducted interviews and designed a questionnaire to identify causes and possible solutions, as seen by the workers themselves. The questionnaire data were then used to develop a list of suggestions for reducing injuries at work. After some resistance from management, many of these suggestions were implemented. In some cases they addressed the causes of injuries directly, by altering or adjusting mechanical equipment. In areas where injuries had been most frequent, methods-redesign groups of managers and employees were established to develop additional proposals. The results were dramatic. The number of injuries in the plant dropped from almost eighty during the first year of intervention to less than ten during the fourth year following the change effort. While other factors, including a change in management, may have influenced these data, they are suggestive of the power of stimulus modification. It appears that, as they acquired increased control, employees drastically reduced on-the-job injuries by the design and implementation of changes that had a direct impact on physical threats to their well-being.

Karasek’s (1979) excellent study of employees in Sweden and the United States suggests that control may also be a potent modifier of the stress-strain relationship. This study was based on national survey data from both countries. A primary finding was that employees who had heavy job demands (measured as role overload and conflict) suffered mental strain when they had low decision latitude (i.e., little potential control over their tasks and conduct throughout the working day). In contrast, Karasek reported that the relationship between heavy job demands and strain was not present among those employees who had high decision latitude.

There are at least two possible explanations for the finding that control attenuated the stress-strain relationship among these respondents. First, as in the nursing-home study, the ability to control relevant aspects of the environment may have changed the meaning of certain stressors that could not be eliminated. For example, employees who have both high levels of control and high levels of role overload may suffer less mental strain than similarly overloaded workers without such control because the high-control workers feel that working sixty hours a week is their own choice, or at least that they had some input in the decision. In contrast, employees compelled to labor sixty hours may suffer mental strain because the workload is inconsistent with their wishes, quite apart from the fatiguing effect of the overtime itself.

Second, employees with higher levels of control in the Karasek study may have been able to alter when and in what way the stressors were received. This kind of control corresponds to Averill’s (1973) concept of regulated administration—that is, regulated by the subject. Averill’s review of laboratory research with animals and humans suggests that regulated administration independently reduces the negative impact of stress. Although it is impossible to reduce the level of some stressors, control may enable a person to regulate where, when, and in what way the stress is encountered. The overloaded employee with a high level of control may choose to work sixteen hours one day and eight hours the next. The overloaded employee with a low level of control may be forced to work twelve hours each day. The ability to regulate when the overload occurs increases both the predictability of the stressor and the dependence between
the member’s responses and outcomes in his or her relevant environment.

The virtues of regulated administration can also be inferred from the small body of literature on flexi-time (Elbing et al. 1974; Golembiewski, Hilles, and Kagno 1974; Walker, Fletcher, and McLeod 1975; Hicks and Klmoski 1981). Research on this topic suggests that dull and repetitive jobs create less subjective stress and strain when workers can control the days and hours that they work. An essential attribute of flexi-time is that the number of hours worked (i.e., the overall level of the stressor) remains constant; only the worker's power to regulate when the stimuli are received is altered.

SUMMARY

Our central assertion is that less strain will be suffered by organization members who can forecast the type of frequency of a stressor, who know the causes and mechanisms of that stressor, and who can produce responses that change significant aspects of that stressor. The cognitive limits of the human species restrict the degree to which anyone can predict, understand, and control job-related threats to his or her well-being. Yet these three elements are variables rather than constants. As they increase, so does the success of organization members in interpreting, avoiding, and mastering stressors in their work environment.

The specific ways in which prediction, control, and understanding may serve as antidotes to occupational stress are shown in figure 17.1. This figure builds on the ISR model of social-environmental determinants of health (French and Kahn 1962; Katz and Kahn 1978) and on the model of the relationships among occupational stress, social support, and health proposed by Larocco, House, and French (1980). We propose that objective organizational (work) stress leads to subjective stress (link a), which in turn leads to strain (link b). Strain is any diverse behavioral, psychological, or physiological response by a person. For instance, a person whose daily hours of work have been increased from eight to twelve (an objective stress) may report role overload (a subjective stress). This subjective role overload may lead to strains such as excessive smoking (a behavioral response), depression (a psychological response), or elevated blood pressure (a physiological response). The figure also indicates that some forms of objective work stress can lead directly to strain (link c). For example, the presence of lead particles in the work environment (an objective stressor) may cause a wide range of adverse physiological conditions independent of the worker’s perceptions (Ledford 1981). The relationships among objective stress, subjective stress, and strain are firmly established in the literature on work and health (for reviews see Cooper and Marshall 1978; Katz and Kahn 1978, chap. 17; and Schuler 1980).

The primary emphasis in the preceding discussion has been on the links that are numbered 1 through 5 in figure 17.1. We have proposed a variety of different ways in which prediction, understanding, and control can serve as antidotes to job stress. As mentioned above, control over a stressor can reduce such objective stress directly (link 1). Further, it appears that all three of these antidotes can weaken the relationship between objective stress and subjective stress (link 2), reduce subjective work stress directly (link 3), and weaken the relationship between subjective stress and strain (link 4). In addition, a wide-ranging body of empirical research suggests that prediction, understanding, and control have main effects upon strains (link 5).

FOR ORGANIZATIONAL RESEARCH

The basic proposition of this chapter is that prediction, understanding, and control in work settings act as buffers or antidotes to stress, both by directly reducing certain stressful aspects of work and by weakening the complex relationship between such stressors and the resulting physiological and psychological strains. The application of this proposition in organization life involves two major assumptions: first, that jobs and organizations can be modified so that people become more able to predict, understand, and control significant aspects of their immediate work environment, and, second, that people want such changes. There are, of course, subsidiary assumptions, for example, that organizations can increase the predictability, understandability, and controllability of jobs without incurring unacceptable costs, and that most people not only want such increases but can han-
dle them appropriately. Whether these assumptions are justified remains to be discovered, but discovery is possible; the assumptions are testable.

They have not yet been tested, however. In emphasizing the potential for stress reduction through the design of jobs and organizations, we are urging a line of research and application that is different from and complementary to the thrust of most current investigations of stress. Researchers and proponents of meditation, diet, exercise, and other diverse regimens all focus on the individual and his or her vulnerability to life's stressful events, at work and elsewhere. They offer advice and activity patterns that are intended to increase the individual's ability to endure such stressful events without physical or psychological damage or decrements in performance.

Specialists in personality measurement and personnel selection are similarly individualistic in their orientation; they are trying to see to it that, to paraphrase Harry Truman's often-quoted dictum, people who can't stand the heat are kept out of the organizational kitchen. And conventional programs of counseling and psychotherapy, insofar as they address organizational impacts on individual behavior and well-being at all, concentrate on increasing individual resilience and resistance to job-imposed stress. Individualistic approaches to organizational stress bear about the same relationship to our approach as individual medicine does to public health. For the most part, they are remedial rather than preventive, and they are expensive. The difference between the two approaches, individual and organizational, is well illustrated by two recent field experiments. In one (Ganster et al. 1982), employees of a public agency were involved in an eight-week training program designed to help them recognize and alter their cognitive interpretations of stressful stimuli; results were favorable in direction but modest in magnitude. Attempts at replication were unsuccessful, and the authors do not recommend the adoption of such programs of stress management.

This experiment can be compared with that of Pasmor and Friedlander (1982), in which the injury rate was dramatically reduced by a series of employee-initiated changes in methods, equipment, and the like. This experiment in participative decision making and hazard reduction is especially impressive because it had been preceded by unsuccessful attempts to achieve similar results by making individuals more safety conscious. In terms of both impact on employee well-being and cost effectiveness, it was better to reduce stressful elements in the workplace through increased employee control than to try to increase employees' tolerance level for stress at work.

We suspect that this would often be the case, and that the best way to deal with organizationally induced stressors would generally be to begin by reducing the stressors themselves, then introduce moderating factors, and only later consider the difficult and costly effort to increase individual tolerance for stress. We propose this preference ordering for both practice and research. The current concentration on individual stress tolerance creates a tendency in both arenas to treat stressors as constant or irreducible even where modification is possible.

For those who find this argument plausible, we offer four researchable questions: (1) What are the relationships among the proposed antidotes—prediction, understanding, and control? (2) What is the relationship between social support and these three antidotes? (3) What is the relationship between these variables and the explication of stress in terms of episodes (stressful life events)? (4) How do individual differences enter into our approach to stress, strain, and antidotes?

**Relationships among the three antidotes**

We have discussed separately the stress- and strain-reducing properties of prediction, understanding, and control. The relationships among them are also relevant for a comprehensive theory of stress and for organizational practice. Competing hypotheses about these relationships are easily framed. First, in organizational life, as in science, it may be that prediction, understanding, and control constitute a continuum of increasing power. Control, according to this view, incorporates prediction and understanding. By controlling a stress or a stress-strain relationship, we show that we understand it. As for prediction, by definition a stress or a stress-strain sequence that we control occurs only when we permit it.

An alternative hypothesis about the relationship among the proposed antidotes accepts control as the most potent of the three but does not rank the other two. Understanding may lead to and may be tested by prediction, but prediction may stimulate the kind of speculation that leads to understanding. Still another possibility is that the three stress antidotes are to some extent interchangeable, so far as their stress-reducing effects are concerned. If so, we would expect the three to share a common antidotal effect and each to have an additional unique effect of its own.

It is likely, of course, that none of these hypotheses will hold without qualification, and that the effectiveness of a given antidote will be contingent on properties of the specific stress-strain sequence under consideration. For example, if Mankiel (1973) is correct in his assertion that investing in the stock market constitutes a "random walk," efforts at prediction and control will be useless. Understanding the chance nature of the enterprise, however, might still provide some relief from strain.
Our main point here, however, is not the relative plausibility of these alternative hypotheses; it is the importance of determining the degree of independence, the substitutability, and the relationship under varying conditions of the three stress-reducing variables—prediction, understanding, and control. These are research tasks.

Relationship between social support and antidotes

To the extent that social support is defined as the expression of positive interpersonal affect—direct expression of fondness, liking, love, or esteem for another person—it’s relationship to the other stress antidotes is a matter for empirical determination. To the extent that social support is defined more broadly (and it often is), its relationship to prediction, understanding, and control becomes part of a definitional issue.

For example, House (1981) includes in his definition a form of support that he calls informational, which incorporates advice, suggestions, directives, and relevant factual material. If the information is accurate and appropriate to the problem at hand, one would expect it to increase the ability of the receiver to predict and understand the confronting stressors. Information can also increase control, especially when the information describes strategies that have been controlling in similar situations. House also describes a class of supportive behaviors that he calls instrumental, which involves direct assistance in effort, material, or money. The apparent intent of such actions is to increase the recipient’s control over his or her immediate situation.

Assuming that informational and instrumental support indeed operate in these ways, either of two interpretations seems appropriate. One can say that these kinds of support reduce strain because they make the situation more predictable, understandable, and controllable. Or one can say that prediction, understanding, and control are actually forms of social support. They may thus provide a basis for classifying several kinds of supportive acts. Both views imply a more proactive model of stress management than is usual in the literature of social support, much of which treats support as alleviating strain without affecting the external stresses that cause it.

Role of individual differences in the proposed stress framework

The core proposition in our model is that work-imposed stresses cause individual strains. We have proposed that three additional attributes of the work setting (the predictability, understanding, and controllability of the stress) act in several ways to reduce such strains. Almost nothing has been said about individual differences, although different people, of course, respond differently to most stresses.

To elaborate our model to recognize individual differences, we would begin with personality variables that are linked theoretically to the three stress antidotes—prediction, understanding, and control. For example, research on the distinction between type A and type B personalities (Chesney and Rosenman 1980) indicates that the type A’s—who are competitive, often hostile and aggressive, and oppressed by the urgency of time—have a greater need for control than the type Bs (usually defined as people who are not type A). We would predict, therefore, that lack of control would cre-
ate more strain for a type A than for a type B person, and that the antidotal effect of increased control would be greater for the type A.

Similar predictions can be made involving other measures of the need for control. Rotter's (1966) work on locus of control would be especially interesting, because it suggests two conflicting hypotheses. Rotter's concept of locus of control is a measure of a person's perception of the degree to which people's lives are controlled by the individuals themselves as opposed to external forces. If a person's sense of locus of control is interpreted as a direct measure of need for control, then the "internals" on Rotter's scale should respond like the type A's in Rosenman's categories. If, on the other hand, the perception of internal control is regarded as a defense mechanism, Rotter's "internals" will relieve the strain of low-control jobs by distorting their real properties.

Understanding and prediction could be treated in analogous fashion. For example, tolerance for ambiguity (Kahn et al. 1964), is a personality attribute that would enter into an elaborated form of our model. Organization members with a low tolerance for ambiguity would be hypothesized to suffer more strain from unpredictable stresses than members with a high tolerance for ambiguity. The research task is to discover which enduring characteristics of individuals should be incorporated into the subsequent development of the prediction-understanding-control framework.

**IMPLICATIONS FOR MANAGERIAL PRACTICE**

In this chapter we have reaffirmed the relevance of stress research for organizational theory, acknowledged the importance of social support as a "buffer" or partial antidote to stress, and proposed the investigation in organizational settings of three other hypothesized antidotes—prediction, understanding, and control.

These are not perfect antidotes, that will work in all circumstances, for all individuals, and in all amounts. On the contrary, their effectiveness is likely to vary, depending on the nature of the stress and the personality of the individual. Moreover, it is likely that, as with other good things, one can get too much of prediction, understanding, and control in one's life. We do not assert that these variables reduce stress in linear fashion, but rather that their stress-reducing properties in organizational life deserve exploration. A further proposal is that the theoretical and empirical search for stress antidotes be extended. Prediction, understanding, and control do not exhaust the set of antidotes. We wish to stimulate the search, not end it.

Finally, we have used examples and cited research that suggest the importance of stress antidotes for organizational practice as well as theory. Their introduction into organizational life should be a task for the designers and managers of organizations. We shall therefore conclude this chapter by considering the implications of prediction, understanding, and control for managerial practice. As stress antidotes, these three factors assume special importance when some new organizational stress threatens an existing equilibrium. The following proposals should therefore be particularly useful to managers who must deal with severe retrenchment, transformation of factory and office procedures by computer-directed technology, and other major organizational changes.

**Be generous with information**

There is an understandable tendency among managers to hoard information. Communication in large organizations is often costly and occasionally disruptive. Research has shown that human beings have a limited capacity for processing information and are prone to "information input overload." The managerial rule of thumb is therefore to give people only the information they need to do their jobs. This limitation is debatable under most conditions, but it is almost certainly wrong when some profound organizational change is imminent. At such times, our framework implies that people will need and seek information to help them understand the causes of potentially threatening events, to predict when they will occur, and to discover which aspects of the change can be avoided, controlled, or used to advantage.

An administrator who managed the closing of a government facility used this tactic of deliberate "information overload" and multiple communication channels to reduce fear, anger, denial, and low performance among employees. He sent out a detailed newsletter each week that included the reasons for the closing, the dates on which individual employees would be laid off, and the employment opportunities that might be available in other government facilities and in the private sector. The information was repeated in memoranda that were posted in each department. Moreover, for especially important announcements, a letter was mailed to each employee. In addition, the administrator met with department heads almost every day to convey new information and respond to questions, and he met each week with all employees for the same purpose.

An enormous amount of information was given to employees affected by this closing. Yet they did not complain; in fact, they sometimes demanded still more. They
sought this quantity of information because it concerned some of the most important aspects of their lives—when, why, and how they would lose their source of income and the community of workers to which they belonged. Moreover, this information helped them discover some steps they might take to cope with these stresses in their environment.

**Acknowledge the information functions of the informal organization**

The arrival of a new machine, a change in organizational structure, or news of impending layoffs will cause employees to spend time watching and discussing the change, perhaps interrupting their work to do so. Managers may be tempted to break up such activities with immediate orders to return to work. Yet these displays of human curiosity may serve to enhance prediction, understanding, and control in ways that are beneficial to both the organization and the employees. This is most easily illustrated with the example of new machines. Employees inevitably want to stand around and watch a new paper copier, word processor, or industrial robot for a while. This period of observation and discussion may help employees understand how the machine operates, predict the impact it will have on their own work, and learn the steps required to operate the machine.

In one organization we observed, a group of fourteen people spent an hour watching one person operate a new word processor. Although some working time was lost during that hour, the period of observation helped secretaries who would be using the new machine feel less threatened by its arrival. Moreover, professional staff members learned some tips for their own manuscript preparation that would enable secretaries to use the new machine more efficiently.

**Don't hold back bad news too long**

Managers often postpone delivering news about layoffs, unwanted transfers, forced retirement, demotions, or pay cuts because they do not wish to face angry or depressed employees. But the framework presented here implies that, during times of imminent change, it is best for affected employees if they are notified early enough to act intelligently in their own interest. Such knowledge is especially useful if presented along with reasons why the organizational change is thought necessary, detailed information about when the change will occur, and descriptions of action alternatives available to employees.

The organization also benefits in some respects if it announces bad news as soon as possible. The prediction-understanding-control framework teaches us that people have a strong need for information about stressful events. This is one of the reasons that rumors are rampant among employees in declining organizations where top-down communication is poor. Employees who are placed in such an information vacuum are trying to make sense—to predict and understand—potential threats in the work environment. Because the sense-making process is inevitable in any group of human beings, it may be useful for management to announce bad news as soon as possible. False rumors are often more threatening than the truth, and they motivate coping behaviors that may be both costly and inappropriate.

The closing of the government facility described previously illustrates that bad news is better than no news. Rumors were numerous during the period just before the closing was announced. Some employees were saying that the facility was going to be closed without notice. Some said that it would never be closed. And still others warned that it would be impossible for union members to collect severance pay if a closing did occur. The decision to announce the closing was made, in part, because the true closing date was much further off than many of the rumors suggested. Moreover, union employees were to receive severance pay.

This closing also illustrates that it is best to provide detailed information about bad news. A list showing each employee's last day was compiled and distributed months before the first layoff occurred. This helped employees predict the onset of this stressor in their own lives, so they could plan to search for a new job, prepare for retirement, or learn the steps required to collect unemployment benefits (which many were forced to do). In other words, this knowledge enabled employees to exercise control over some aspects of an event fundamentally beyond their control.

**Minimize the duration of those periods in which organization members experience loss of prediction, understanding, or control**

Although not explicitly included in our framework, duration is a relevant variable. Long exposure to stressors that cannot be predicted, understood, or controlled will cause more damage than brief exposure. Long-term exposure to some stressors can lead to illness; brief exposure to the same stressors may cause only short-term psychological and physical discomfort. This is a simple truth and its managerial implications seem obvious. They are, however, frequently ignored.
The current "down-sizing" of many American universities illustrates these points. When a unit within a university is considered for elimination or large budget cuts, a complex, protracted, formal process of review usually ensues. This procedure conforms to major aspects of our framework and has some advantages for members of the university unit under review. The steps and time frame for the review are usually made explicit (prediction); the reason for the review is announced (understanding); and the steps that can be taken to defend the unit are made explicit (control). Nonetheless, this review period is stressful. Members are uncertain of the fate of their work group. They may be uncertain of their own employment status; even tenured faculty have been at risk in some schools. Members of the affected units may not believe the announced reason for the review, and often feel they can do little to influence the decision.

It is probably impossible to remove the profound loss of prediction, understanding, and control that usually accompanies such ordeals. The very act of questioning the right of a social unit to exist will cause much stress for members. Much can be done, however, to shorten the period of distress. In our experience, such reviews move at an agonizingly slow pace. Committees have monthly meetings. Reports take months to write. Public hearings are spread over a long period of time. After all recommendations are received from various subcommittees, administrators may take several more months to reach a final decision. Thus, the members of the unit under scrutiny are often forced to endure this profound stress for a year or longer.

We suggest that steps can be taken to compress the review period. Committee meetings can be held more frequently. Public meetings can be held at shorter intervals. Severe deadlines can be established for the preparation of reports, as well as for decisions made by executive officers. Changes such as these would not reduce the force of the stress experienced by those who are the target of review, but they could reduce the duration and therefore the cumulative effects of the stress experience.

The last two sections of this chapter, on the implications of the prediction-understanding-control framework for research and for management, epitomize a persisting tension between theory and application. Research workers, entranced with their theories but keenly aware of the limitations of their data, want more research. Managers, who must act on some mixture of evidence and intuition, want data-based advice now. We have concluded our chapter with four advisory statements, even though we regard each of them as a hypothesis yet to be fully tested. May they be useful in their present form and improved by the research that awaits them.

REFERENCES


